



## **TRAFFIC IMPACT STUDY**

**Proposed Mid-Rise Residential**  
1 Half Moon Bay Drive  
Croton-on-Hudson, NY

*Prepared for*  
**1 HMB Property Owner, LLC**  
**595 Madison Avenue, Suite 1903**  
**New York, NY 10022**

*Prepared by*  
**DTS Provident Design Engineering, LLP**  
**1 North Broadway**  
**White Plains, New York**

**July 9, 2024**

**DTS Provident Project No. 1027**

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**SECTION 1 – EXECUTIVE SUMMARY**

1.0 PROJECT DESCRIPTION

The Applicant proposes to redevelop an existing Warehouse use with a multi-family housing building at 1 Half Moon Drive in the village of Croton-on-Hudson, Westchester County, New York. The proposed Project will consist of a total of 280 dwelling units.

DTS Provident Design Engineering, LLP (DTS Provident) has been retained to analyze any potential traffic impacts associated with the proposed Project and to identify roadway improvements, if required, to mitigate any adverse impact. The scope of this study was based upon our understanding of the potential traffic impacts and anticipated trip distributions.

This Traffic Impact Study uses standard Traffic Engineering methodology and has been prepared to document the findings and conclusions of the analysis undertaken to measure the traffic impacts associated with the proposed Project. For the purposes of this Study, it is anticipated that the proposed Project will be completed and occupied by the Year 2026.

## 1.1 FINDINGS

Based on field observations and detailed analyses undertaken in preparation of this Traffic Impact Study, the following findings are presented:

- The proposed project is provided good regional and local vehicular access via Croton Expressway State Route 9 Northbound and Southbound ramps leading onto Municipal Place for direct access to the site.
- Access to the site will be provided via two unsignalized access points along Half Moon Bay Drive, as well as a gated emergency access driveway.
- Based upon the Institute of Transportation Engineers' (ITE) "Trip Generation Manual 11<sup>th</sup> Edition", it is anticipated that the proposed Project when compared to the existing Warehouse use will generate approximately 79 and 73 additional vehicles during the Peak Weekday AM Hour and Peak Weekday PM Hour, respectively.
- Table No. 1.1 below summarizes the results of the capacity analyses conducted for each intersection included in the Traffic Study. Average delay, expressed in seconds per vehicle, is listed below each Level of Service.

<b>TABLE NO. 1.1 OVERALL LEVEL OF SERVICE SUMMARY</b>				
<b>INTERSECTION</b>	<b>PEAK WEEKDAY AM HOUR</b>		<b>PEAK WEEKDAY PM HOUR</b>	
	<b>No-Build</b>	<b>Build</b>	<b>No-Build</b>	<b>Build</b>
	<b>LOS Delay</b>	<b>LOS Delay</b>	<b>LOS Delay</b>	<b>LOS Delay</b>
Croton Expressway Southbound Ramp & Municipal Place	c 18.6	c 19.4	b 12.5	b 12.7
Croton Expressway Northbound Ramp & Municipal Place	b 11.4	b 11.5	b 11.9	b 13.7
South Riverside Avenue & Municipal Place	B 17.7	B 17.6	B 17.5	B 17.4
Half Moon Bay Drive & Site Driveway	a 9.2	a 9.6	a 9.7	a 10.0

**NOTE:** Average delay is represented in seconds per vehicle.  
 Lowercase letters represent an unsignalized intersection.  
 Delay of unsignalized intersections is reported as the highest delayed approach.

- All analyzed intersections will continue to operate at acceptable Levels of Service with the proposed Project. Therefore, no additional roadway improvements are required as a result of the proposed Project.

## 1.2 RECOMMENDATIONS

No additional roadway improvements are recommended at any of the study locations in conjunction with the proposed Project.

1.3 CONCLUSIONS

It is the considered professional opinion of DTS Provident that the additional traffic generated by the proposed Project will not have a significant impact on the adjacent roadway network. Safe and efficient traffic operations will be maintained.

Respectfully submitted,

**DTS PROVIDENT DESIGN ENGINEERING, LLP**

Carlito Holt, P.E., P.T.O.E.  
Partner

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**SECTION 2 – TRAFFIC CONDITIONS AND PROJECTIONS**

2.0 STUDY METHODOLOGY

DTS Provident has been retained to analyze the traffic impact associated with the proposed multi-family residential building at 1 Half Moon Bay Drive.

The existing traffic volumes were collected by representatives of DTS Provident at adjacent roadways in the vicinity of the Site on November 28, 2023. The existing base traffic volumes were projected to the Design Year of 2026 utilizing a 1.5% growth rate compounded per year to which the site-generated traffic from the Project was added, resulting in the 2026 No-Build and 2026 Build Traffic Volumes respectively. Utilizing the 2026 No-Build and Build Traffic Volumes, DTS Provident performed detailed capacity analyses of the key intersections to identify the operational characteristics and to measure the traffic impact of the proposed Project on the adjacent roadway system. Based upon the results of the analysis, comparisons of the 2026 No-Build and Build conditions for the proposed Project were made. If significant impacts were experienced, mitigation was proposed.

## 2.1 DESCRIPTION OF EXISTING ROADWAY NETWORK

The following are brief descriptions of the roadways located in the vicinity of the Site:

The Croton Expressway Southbound Ramp is a one-way lane that stems from the Expressway (US Route 9). Vehicles are directed to decrease their speed from the 55 mph Expressway to the village speed limit of 30 mph. There are both yellow and white edge line markings. This Ramp is under jurisdiction of the New York State Department of Transportation (NYSDOT).

The Croton Expressway Northbound Ramp is a one-way lane that stems from the Expressway (US Route 9). Vehicles are directed to decrease their speed from the 55 mph Expressway to the village speed limit of 30 mph. There are both yellow and white edge line markings. This Ramp is under jurisdiction of the New York State Department of Transportation (NYSDOT).

Municipal Place has two lanes in each direction between South Riverside Avenue and the Croton Expressway Southbound Ramp. One lane is left-turn only westbound approaching the Southbound Ramp and the other becomes right-turn only lane eastbound approaching South Riverside Avenue. There is road striping present with double yellow lines in the center of the roadway and white line edge marking. This road has a village speed limit of 30 mph. Municipal Place is under the local jurisdiction of the Village of Croton-on-Hudson.



South Riverside Avenue (State Route 9A) is a two-way road with one lane in each direction. There is road striping present with double yellow lines in the center of the roadway and white line edge marking. This road has a speed limit of 30 mph and is under the jurisdiction of the New York State Department of Transportation (NYSDOT).

## 2.2 2023 EXISTING TRAFFIC VOLUMES

After reviewing the potential traffic impacts and anticipated trip distributions, the following study locations were identified:

1. Croton Expressway Southbound Ramp & Municipal Place
2. Croton Expressway Northbound Ramp & Municipal Place
3. South Riverside Avenue & Municipal Place
4. Half Moon Bay Drive & Site Driveway

Representatives of DTS Provident conducted turning movement traffic counts on Tuesday November 28, 2023, from 6:30 AM to 9:30 AM and 3:30 PM to 6:30 PM. Based upon the traffic counts conducted, the following Peak Roadway Hours were determined:

Peak Weekday AM Roadway Hour – 7:15 AM to 8:15 AM

Peak PM Weekday Roadway Hour - 4:00 PM to 5:00 PM

The 2023 Existing Traffic Volumes are illustrated on Figure No. 2 in Appendix B.

### 2.3 2026 NO-BUILD TRAFFIC VOLUMES

In order to project to the future 2026 design year, a compounded annual growth rate of 1.5% per year was applied to the existing traffic volumes. The 2026 Grown Traffic Volumes are illustrated on Figure No. 3. Based upon information obtained from the NYSDOT and DTS Provident's ATR data, this is a more than conservative growth rate. In addition to the growth rate, volumes from the following nearby adjacent developments were included in the background traffic:

- 25 South Riverside
- 325 South Riverside
- 41-51 Maple Street

The Adjacent Development Traffic Volumes are illustrated on Figure Nos. 4 through 6. These volumes were combined with the 2026 Grown Traffic Volumes to form the 2026 No-Build Traffic Volumes illustrated on Figure No. 7. It should be noted that the proposed Lot A development at the Croton-Harmon Station Parking Lot was also considered as a potential adjacent development; however, based on that project's potential trip generation and location it would not be a major traffic generator within the proposed Project's study area. Therefore, the background growth rate adequately accounts for the potential Lot A development.

2.4 SITE-GENERATED TRAFFIC VOLUMES

The ability of any roadway network to accommodate anticipated traffic volumes is measured by comparing Peak Hour Traffic Volumes to roadway capacities. Thus, it is essential to determine the hourly traffic volumes to be generated by the proposed Project and add them to the No-Build Traffic Volumes to determine the Build Traffic Volumes.

The Site-generated traffic volumes attributable to the proposed Project was determined based upon the trip generation rates contained in ITE’s report entitled, “Trip Generation”, 11th Edition, utilizing Land Use Code 221 Multi-family housing (Mid-rise). These values are compared to that of Land Use Code 150 Warehousing as this is the current development on site. The estimated Site-generated traffic volumes and difference between trips of the current and proposed developments are outlined in Table No. 2.1 below.

TABLE NO. 2.1							
TRIP GENERATION TABLE - ITE 11 <sup>th</sup> EDITION							
	LAND USE (CODE)	SIZE	UNIT	AM Peak Hour		PM Peak Hour	
				Enter	Exit	Enter	Exit
Existing Development	Warehouse (150)	119,000	SF	29	9	11	30
Proposed Development	Multi-family Housing (Mid-Rise) (221)	280	Dwelling Units	26	86	67	42
<b>Difference (Passenger Vehicles)</b>				<b>-4</b>	<b>77</b>	<b>55</b>	<b>12</b>

Note: Trip Generation rates based upon Institute of Transportation Engineers’ (ITE) “Trip Generation Manual”, 11<sup>th</sup> Edition

## 2.5 ARRIVAL/DEPARTURE DISTRIBUTION

The arrival/departure distribution patterns for traffic to be generated by the proposed Project were developed based upon the existing traffic volumes, potential destinations, and the existing roadway network. The resulting arrival and departure distributions are illustrated on Figure Nos. 8 and 9 in Appendix B.

## 2.6 2026 BUILD TRAFFIC VOLUMES

The Site-generated Traffic Volumes were distributed to the roadway network in accordance with the arrival/departure distributions. The Site-generated Traffic Volumes for the proposed Project are illustrated on Figure No. 10 in Appendix B. The Site-generated Traffic Volumes for the proposed Project were combined with the 2026 No-Build Traffic Volumes to form 2026 Build Traffic Volumes illustrated on Figure No. 11 in Appendix B.

### **SECTION 3 – ANALYSIS**

#### 3.0 DESCRIPTION OF ANALYSIS

Capacity analyses were conducted at the key intersections to identify any potential traffic impact associated with the proposed Project. The following section contains a brief description of the procedure utilized in the preparation of this analysis for all the study locations listed:

- Capacity analysis is a method by which traffic volumes are compared to calculated roadway and intersection capacities to evaluate future traffic conditions. The methodology utilized is described in the Highway Capacity Manual published by the Transportation Research Board. In general, the term “Level of Service” is used to provide a qualitative evaluation based on certain quantitative calculations related to empirical values. The definitions of Level of Service as contained in the Highway Capacity Manual appear in Appendix A of this Report.
- In general, Level of Service A represents the best traffic operating condition. Levels of Service for signalized and unsignalized intersections are defined in terms of average delay. Delay is used as a measure of driver discomfort, frustration, efficiency, etc.

Capacity analyses were performed for the key locations with the 2023 Existing, 2026 No-Build and 2026 Build Traffic Volumes utilizing Highway Capacity Software (Synchro) developed for the FHWA. The capacity analyses worksheets are contained in Appendix D of this Report.

### 3.1 LOCATION NO. 1 – CROTON EXPY SOUTHBOUND RAMP & MUNICIPAL PLACE

#### Existing Conditions

This four-legged intersection is unsignalized and is controlled by stop signs on Half Moon Drive and the Croton Expressway Southbound Ramp approaching the intersection. Croton Expressway Southbound Ramp provides the one-way southern approach with one left-turn/through/right-turn lane. Municipal Place provides the eastern and western approaches with one left-turn only lane and one left-turn/through lane eastbound and two through lanes westbound.

#### Capacity Analysis

Capacity analyses were conducted for this location utilizing the 2023 Existing, 2026 No-Build and 2026 Build Traffic Volumes for the Peak Weekday AM and PM Hours. Due to limitations in the capacity analysis software, and to provide the most conservative analysis, the intersection was analyzed with all approaches under STOP control. The results of these analyses are shown in Table C-1 in Appendix C. As indicated in the table, acceptable Levels of Service are maintained during the Peak Weekday AM and PM Hours for the No-Build and Build conditions. As such, no improvements are required at this location as a result of the proposed Project.

### 3.2 LOCATION NO. 2 – CROTON EXPY NORTHBOUND RAMP & MUNICIPAL PLACE

#### Existing Conditions

This four-legged intersection is unsignalized and is controlled by a stop sign on the Croton Expressway Northbound Ramp approaching the intersection. The Croton Expressway Northbound Ramp provides a one-way northern approach with one left-turn/through/right-turn lane. Municipal Place provides the eastern and western approaches with two lanes in each direction that can be utilized to turn onto the Croton Expressway Northbound Ramp.

#### Capacity Analysis

Capacity analyses were conducted for this location utilizing the 2026 Build Traffic Volumes for the Peak Weekday AM and PM Hours. The results of these analyses are shown in Table C-2 in Appendix C. As indicated in the table, acceptable Levels of Service are demonstrated during the Peak Weekday AM and PM Hours for the Build condition. As such, no improvements are required at this location as a result of the proposed Project.

### 3.3 LOCATION NO. 3 – SOUTH RIVERSIDE AVENUE AND MUNICIPAL PLACE

#### Existing Conditions

This four-legged intersection is signalized and controlled by traffic lights. South Riverside Avenue provides the northern and southern approaches with one left-turn/through/right-turn lane in each direction. Municipal Place provides the eastern and western approaches. Eastbound traffic has one left-turn/through/right-turn lane. Westbound traffic has a left-turn/through lane and a right-turn only lane.

#### Capacity Analysis

Capacity analyses were conducted for this location utilizing the 2026 Build Traffic Volumes for the Peak Weekday AM and PM Hours. The results of these analyses are shown in Table C-3 in Appendix C. As indicated in the table, acceptable Levels of Service are demonstrated during the Peak Weekday AM and PM Hours for the Build condition. As such, no improvements are required at this location as a result of the proposed Project.



3.4 LOCATION NO. 4 – SOUTH RIVERSIDE AVENUE AND MUNICIPAL PLACE

Existing Conditions

This three-legged intersection is controlled by a stop sign on the Site Driveway. Municipal Place turns into Half Moon Bay Drive in the Eastbound direction of the intersection. Half Moon Bay Drive has one through lane per direction and gives access to the Site Driveway.

Capacity Analysis

Capacity analyses were conducted for this location utilizing the 2026 Build Traffic Volumes for the Peak Weekday AM and PM Hours. The results of these analyses are shown in Table C-4 in Appendix C. As indicated in the table, acceptable Levels of Service are demonstrated during the Peak Weekday AM and PM Hours for the Build condition. As such, no improvements are required at this location as a result of the proposed Project.

**SECTION 4 –CONCLUSIONS**

4.0 CONCLUSIONS

It is the considered professional opinion of DTS Provident that the traffic volumes associated with the proposed Project will not have an adverse impact upon the adjacent roadway network. Safe and efficient traffic operating conditions will be provided for through traffic as well as traffic destined to and from the Site. No additional infrastructure improvements are required in conjunction with the proposed Project other than construction of the Site Driveways.

<https://divneytungschwalbe.sharepoint.com/sites/DTSP/Shared Documents/General/PDE Q/PROJECTS-DTSP/1027 - Monday Properties - Croton/Reports/Traffic Impact Study/1027 - TIS - Monday Properties Croton-on-Hudson July 2024.docx>

APPENDIX A

LEVEL OF SERVICE STANDARDS

# 1. LEVEL OF SERVICE

## CONCEPT

The Highway Capacity Manual, published by the Transportation Research Board of the U.S. Government, established a system by which highway facilities are examined for their adequacy to handle traffic volumes. The terminology "Level of Service" is used to provide a "qualitative" evaluation based on certain "quantitative" calculations which are related to empirical values.

Intersection Capacity, Delay and resultant Levels of Service are dependent upon a number of factors, including the following:

- Area Type
- Intersection geometrics
- Traffic volumes
- Parking conditions
- Pedestrian activity
- Vehicle Mix
- Bus Stop location and activity
- Peak Hour Factor
- Traffic Signal operation, if applicable

Ramp and weaving area Densities and resultant Levels of Service are dependent upon a number of factors, including the following:

- Number of lanes
- Configuration of weaving area
- Length of acceleration/deceleration lanes
- Vehicle speeds
- Traffic volumes
- Vehicle Mix
- Peak Hour Factor

## FACTORS

### SIGNALIZED INTERSECTIONS

Level of Service for Signalized Intersections is defined in terms of Delay, which is a measure of driver discomfort, frustration, fuel consumption, and loss of travel time. Specifically, Level of Service criteria are stated in terms of the Average Control Delay per vehicle for the peak 15-minute period within the hour analyzed.

Delay is a complex measure and is dependent upon a number of variables, including:

- Cycle length
- Ratio of Green time to Cycle length (G/C)

- Ratio of Volume to Capacity (V/C) for lane group or approach
- Traffic signal progression

### UNSIGNALIZED INTERSECTIONS

Level of Service for Unsignalized Intersections is also defined in terms of Delay. The amount of Delay is based upon the availability of "gaps" in the mainline traffic stream and the acceptance of these gaps by motorists waiting on the side street to enter the main street traffic flow.

### RAMP AND RAMP JUNCTIONS

Level of Service for ramp freeway junctions and the ramp proper are defined in terms of Density (passenger cars per mile per lane). Density is related to the traffic flow in the area of influence.

### WEAVING AREAS

Level of Service for weaving areas is defined in terms of Density (passenger cars per mile per lane). Density is based on the ratio of weaving vehicles to non-weaving vehicles and on vehicle speeds in the weaving area of influence

### CRITERIA

The criteria for the various Level of Service designations are as follows:

	<b>SIGNALIZED</b>	<b>UNSIGNALIZED</b>
<b>LEVEL OF SERVICE</b>	<b>Average Control Delay per Vehicle (Seconds)</b>	<b>Average Control Delay per Vehicle (Seconds)</b>
A	10.0 or less	10.0 or less
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	80.1 or greater	50.1 or greater

Level of Service	Ramp-Freeway Junction	Ramp Proper	Weaving Areas	
	Maximum Density pc/mi/ln	Density Range pc/mi/ln	Maximum Density pc/mi/ln	
			Freeway Weaving Area	Multi-lane + C-D Weaving Area
A	≤10	≤11	≤10	≤12
B	>10 - 20	>11 – 18	>10 - 20	>12 - 24
C	>20 - 28	>18 – 26	> 20 - 28	>24 - 32
D	>28 - 35	>26 – 35	>28 - 35	>32 - 36
E	>35	>35 – 45	>35 - 43	>36 - 40
F	Demand exceeds capacity	>45	>43	>40

## **DESCRIPTION**

The following is a brief description of each of the six Level of Service designations as defined by the Highway Capacity Manual:

### **SIGNALIZED INTERSECTIONS**

#### **LEVEL OF SERVICE A**

Average Control Delay - 10.0 secs. or less

Describes operations with very low delay. Occurs when progression is extremely favorable and most vehicles arrive during the Green Phase and do not stop at all. Short cycle lengths may also contribute to low delay.

#### **LEVEL OF SERVICE B**

Average Control Delay - 10.1 to 20.0 secs.

Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.

#### **LEVEL OF SERVICE C**

Average Control Delay - 20.1 to 35.0 secs.

Higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this Level of Service. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.

## **LEVEL OF SERVICE D**

Average Control Delay - 35.1 to 55.0 secs.

The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high Volume/Capacity (V/C) Ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

## **LEVEL OF SERVICE E**

Average Control Delay - 55.1 to 80.0 secs.

The limit of acceptable delay.

Higher delay values generally indicate poor progression, long cycle lengths, and high V/C Ratios. Individual cycle failures are frequent occurrences.

## **LEVEL OF SERVICE F**

Average Control Delay - in excess of 80.0 secs.

Unacceptable to most drivers.

Occurs with oversaturation, i.e., arrival flow rates exceed the capacity of the intersection. May also occur at high V/C Ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.

## UNSIGNALIZED INTERSECTIONS

### **LEVEL OF SERVICE A**

Average Control Delay - 10.0 secs. or less  
Operations with little or no delay to minor turning movements.

### **LEVEL OF SERVICE B**

Average Control Delay - 10.1 to 15.0 secs.  
Operations with short delays on minor turning movements.

### **LEVEL OF SERVICE C**

Average Control Delay - 15.1 to 25.0 secs.  
Operations with average delays on minor turning movements.

### **LEVEL OF SERVICE D**

Average Control Delay - 25.1 to 35.0 secs.  
Operations with some delays on minor turning movements.

### **LEVEL OF SERVICE E**

Average Control Delay - 35.1 to 50.0 secs.

Operations with long delays on minor turning movements.

### **LEVEL OF SERVICE F**

Average Control Delay - In excess of 50.0 secs.

Operations where demand exceeds capacity. Very long delays with queuing may be experienced on the minor street approach.

## **RAMPS AND RAMP JUNCTIONS**

### **LEVEL OF SERVICE A**

Maximum Density - 10 pc/mi/ln

Unrestricted operations with no noticeable turbulence in the ramp influence area.

### **LEVEL OF SERVICE B**

Maximum Density - 20 pc/mi/ln

Minimal levels of turbulence exist and speeds of vehicles in the influence area begin to decline.

### **LEVEL OF SERVICE C**

Maximum Density - 28 pc/mi/ln

Level of turbulence becomes noticeable as average speed within the influence area declines. Driving conditions are still relatively comfortable at this level.

### **LEVEL OF SERVICE D**

Maximum Density - 35 pc/mi/ln

Turbulence levels become intrusive. Queues may form on some high volume on-ramps but freeway operation remains stable.

### **LEVEL OF SERVICE E**

Maximum Density - >35 pc/mi/ln

Conditions approaching and reaching capacity. Speeds are reduced and turbulence of merging/diverging vehicles becomes intrusive to all vehicles in the influence area. Flow levels approach capacity limits and minor changes in demand can cause ramp and freeway queues to occur.

### **LEVEL OF SERVICE F**

Maximum Density – Demand flow exceeds limits



Unstable, or breakdown, operation. Approaching demand flows exceed the discharge capacity of the downstream freeway or ramp. Queues are visibly formed on the freeway and on-ramps and will continue to grow as long as the approaching demand exceeds the discharge capacity.

APPENDIX B

TRAFFIC FIGURES



**DTS • PROVIDENT**  
Intelligent Land Use

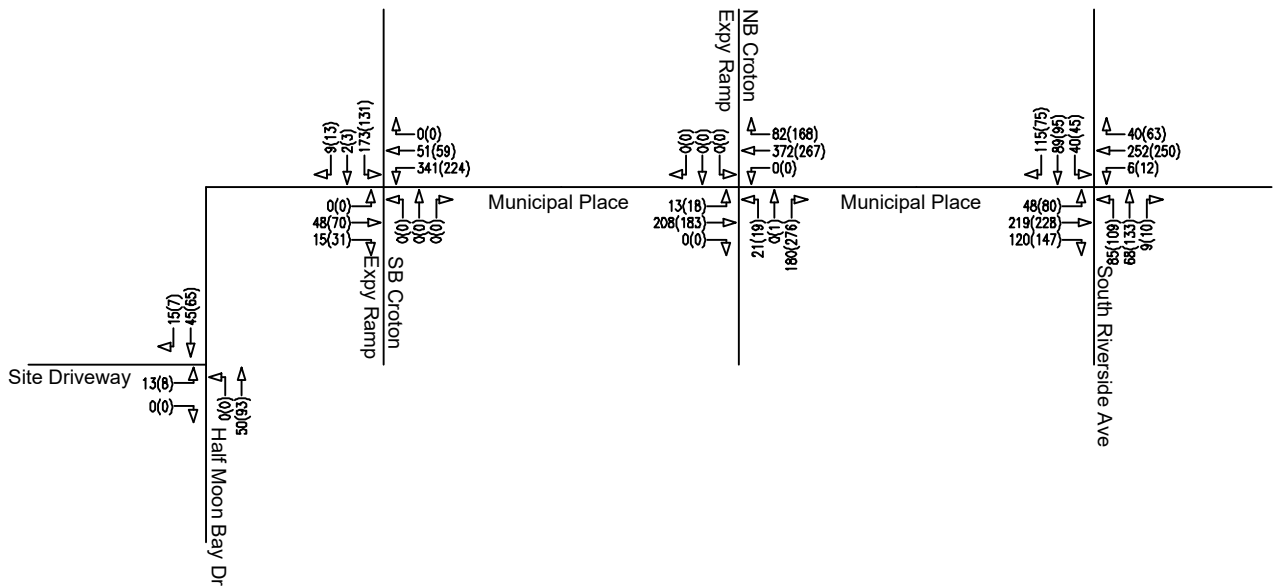
DTS Provident Design Engineering, LLP  
One North Broadway  
White Plains, NY 10601  
P: 914.428.0010  
F: 914.428.0017

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Site Location

1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

Figure No. 01



**DTS • PROVIDENT**  
Intelligent Land Use

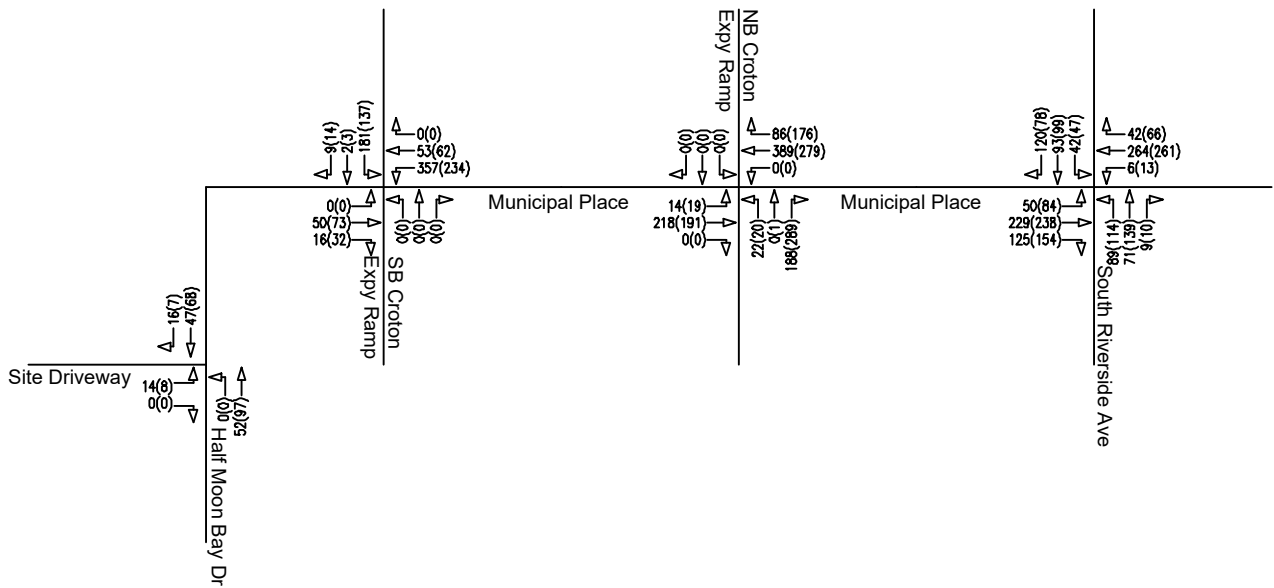
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Project No. 1027

Existing Traffic Volumes  
1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

Figure No. 02





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 Intelligent Land Use

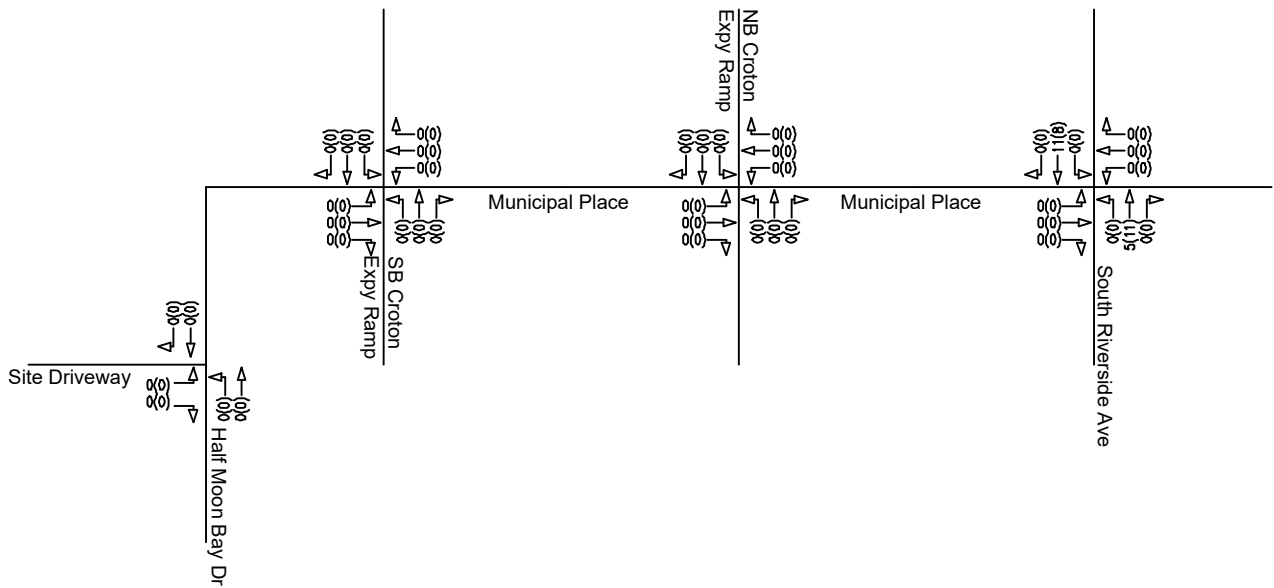
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**Grown Traffic Volumes**

1 Half Moon Bay Drive  
 Croton-On-Hudson, Westchester County, NY

Project No. 1027

Figure No. 03



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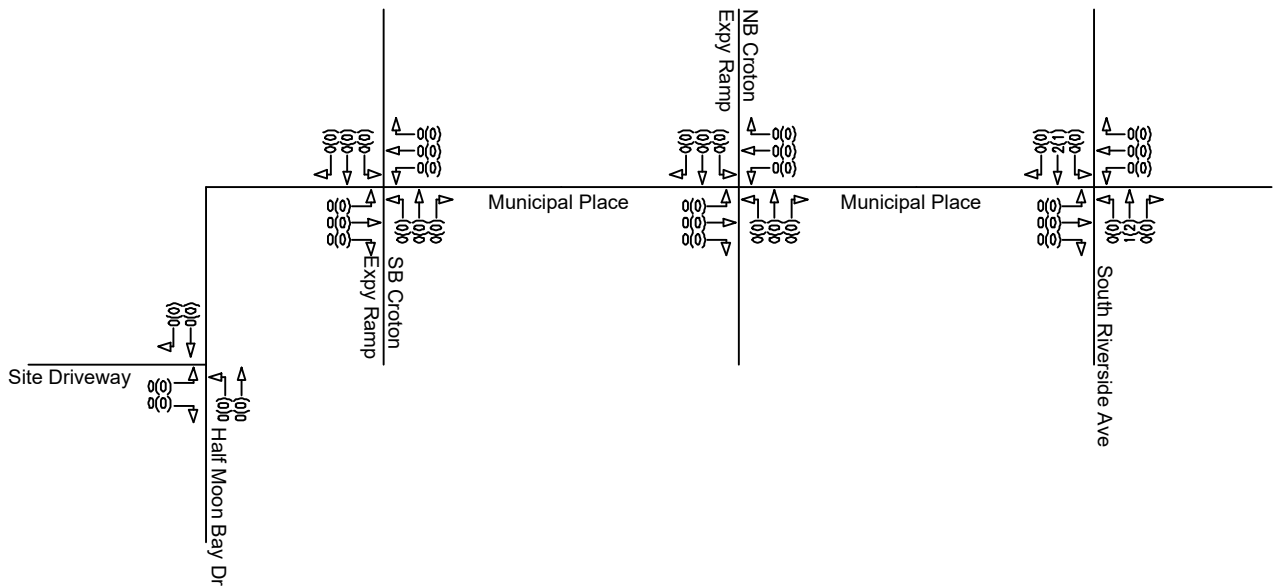
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Adjacent Development - 25 South Riverside

1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

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Figure No. 04



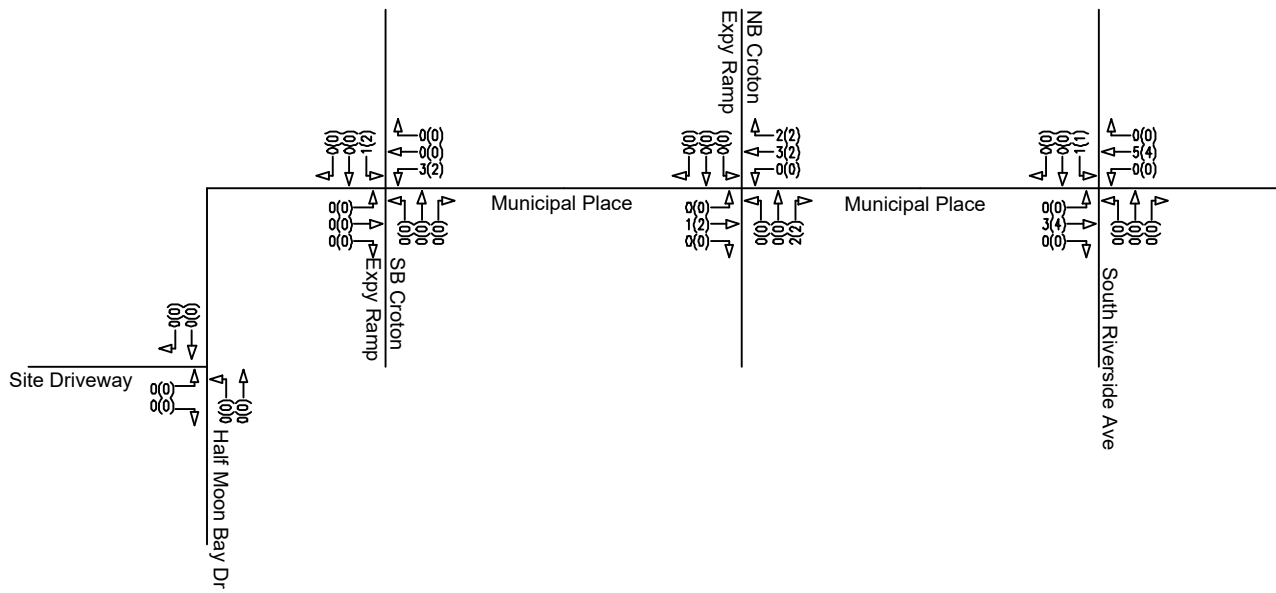
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One North Broadway  
White Plains, NY 10601  
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Adjacent Development - 325 South Riverside  
1 Half Moon Bay Drive  
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Figure No. 05



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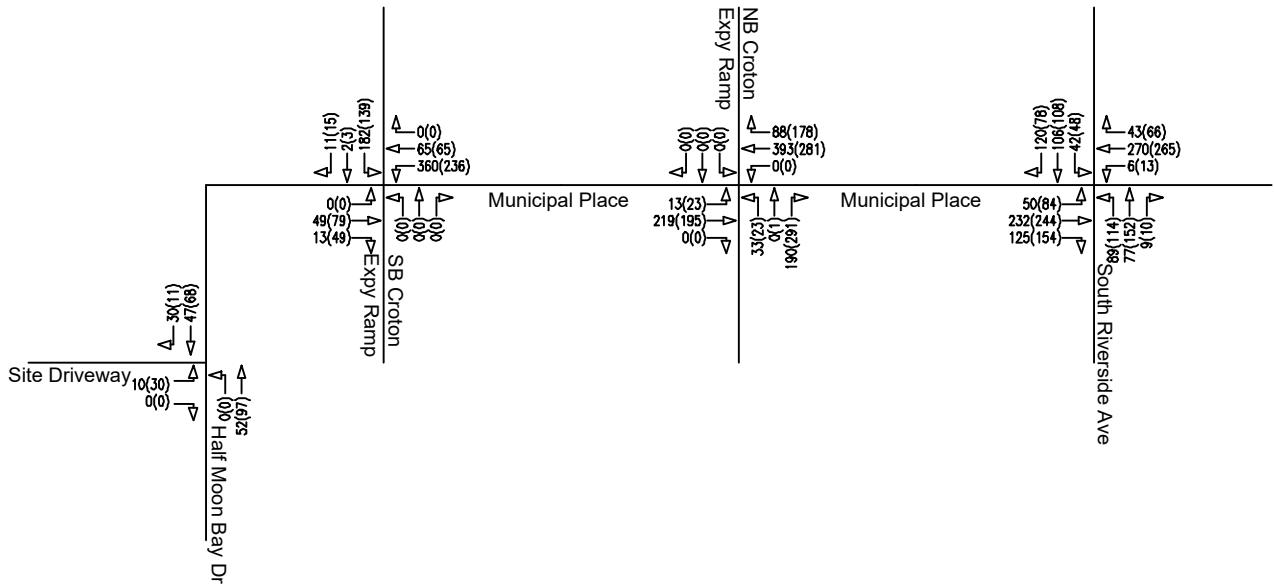
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Adjacent Development - 4151 Maple Street  
1 Half Moon Bay Drive  
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Figure No. 06





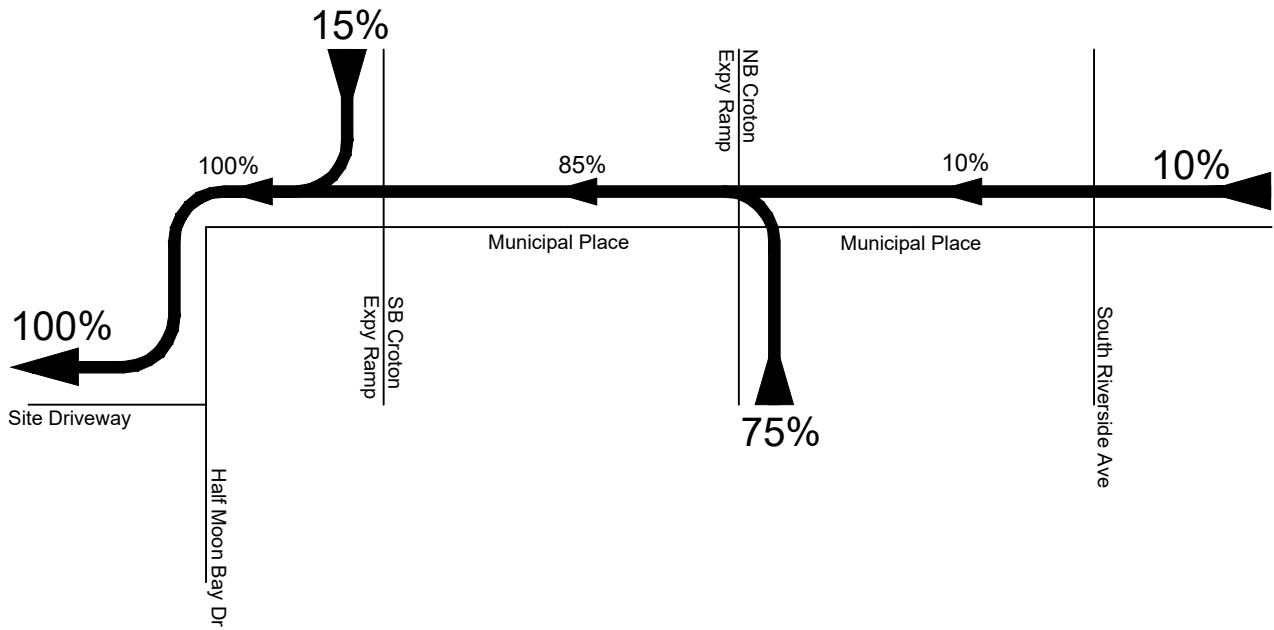
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No-Build Traffic Volumes  
1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

Figure No. 07



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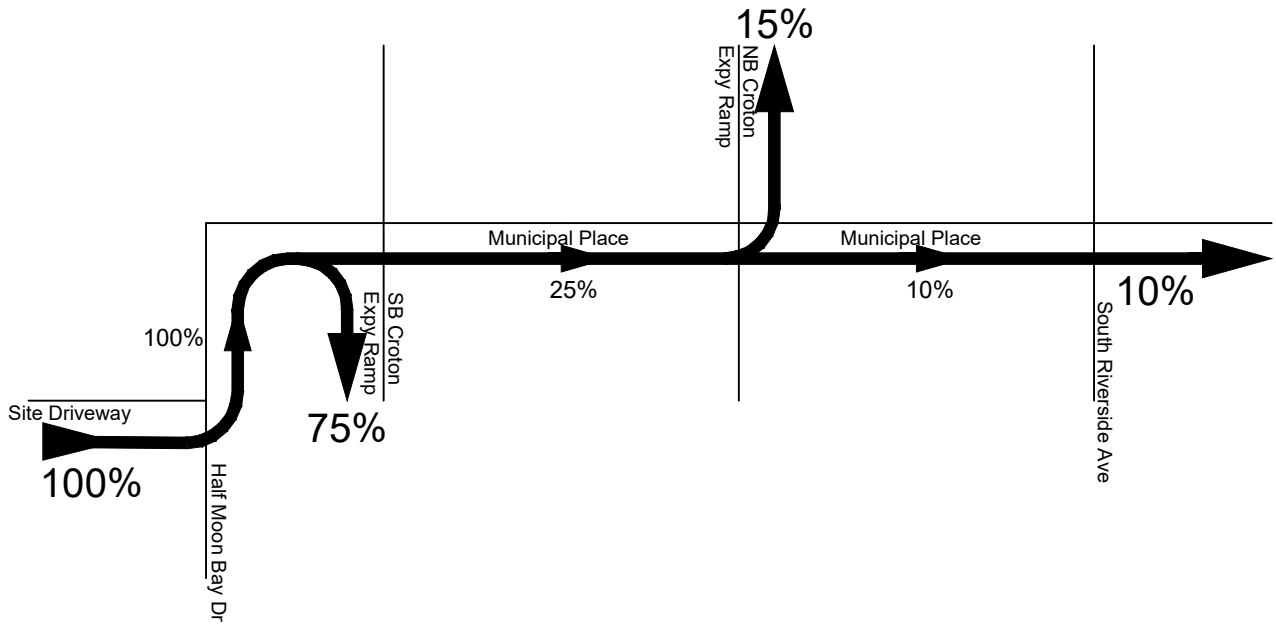
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Arrival Distribution  
1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

Figure No. 08



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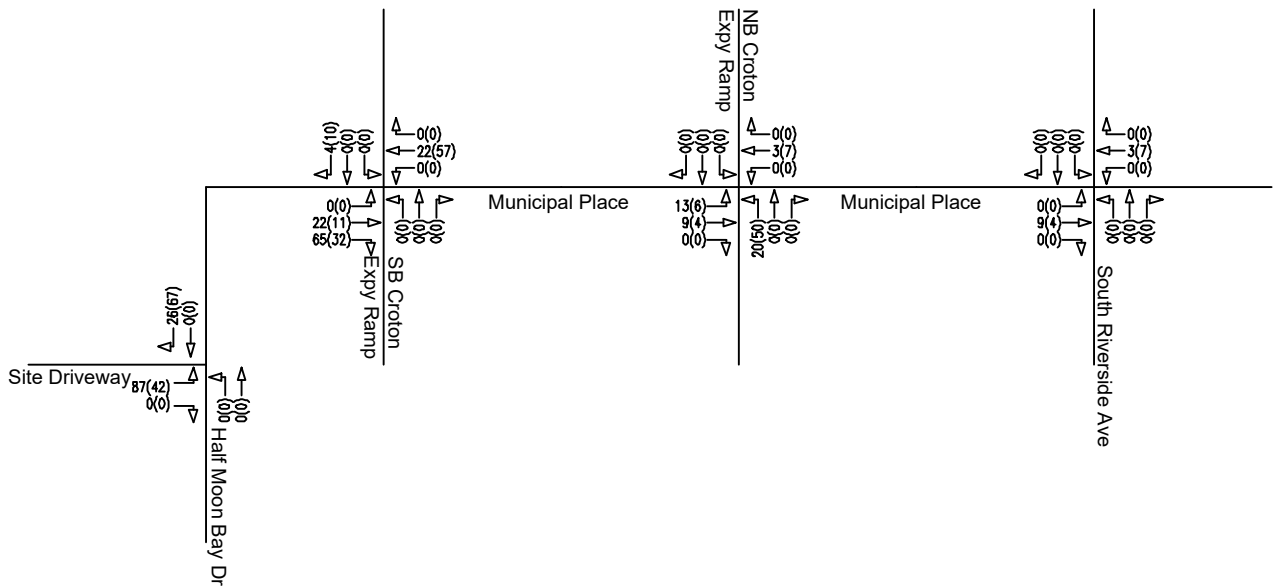
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Departure Distribution  
1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

Project No. 1027

Figure No. 09



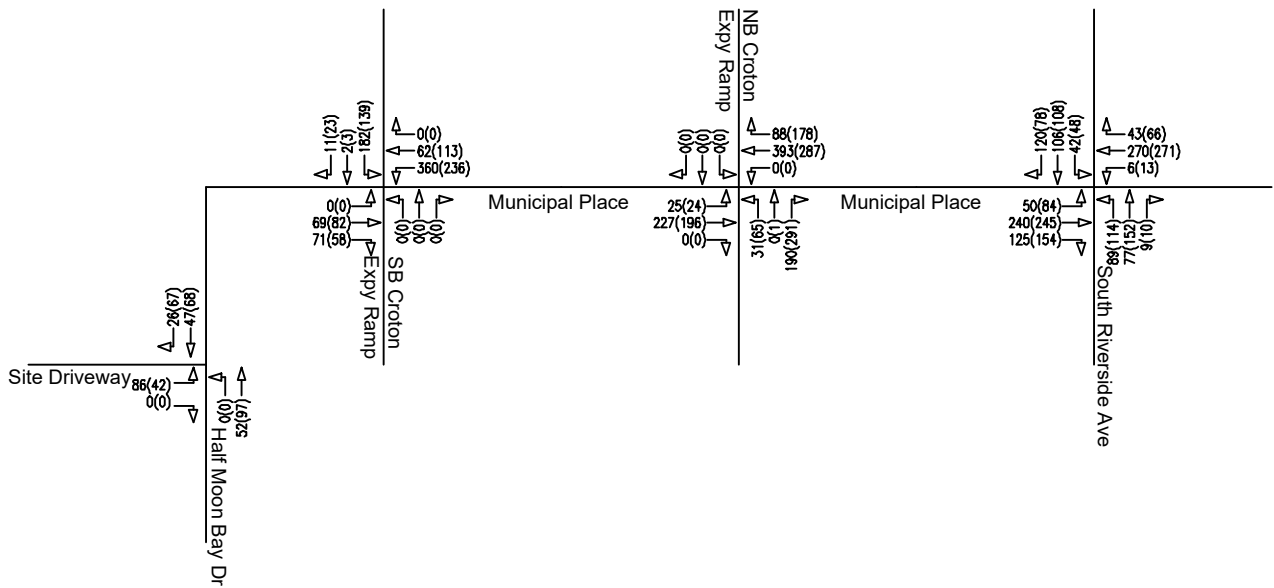
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Site Generated Traffic Volumes  
1 Half Moon Bay Drive  
Croton-On-Hudson, Westchester County, NY

Project No. 1027

Figure No. 10



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**Build Traffic Volumes**  
 1 Half Moon Bay Drive  
 Croton-On-Hudson, Westchester County, NY

Figure No. 11

APPENDIX C

LEVEL OF SERVICE SUMMARY

TABLES

**TABLE C-1**  
**PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE**  
**Croton Expy Southbound Ramp & Municipal Place**

<b>APPROACH</b>		<b>AM PEAK HOUR</b>			<b>PM PEAK HOUR</b>		
		<b>2023</b>	<b>2026</b>	<b>2026</b>	<b>2023</b>	<b>2026</b>	<b>2026</b>
		<b>EXISTING</b>	<b>NO-BUILD</b>	<b>BUILD</b>	<b>EXISTING</b>	<b>NO-BUILD</b>	<b>BUILD</b>
		<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>
<b>Croton Expy Southbound Ramp</b>							
<b>SB</b>	<b>LTR</b>	b 11.2	b 11.6	b 12.2	a 9.9	b 10.2	b 10.5
<b>Municipal Place</b>							
<b>EB</b>	<b>TR</b>	a 9.0	a 9.1	a 10.0	a 8.6	a 9.0	a 9.2
<b>WB</b>	<b>L</b>	c 17.1	c 18.6	c 19.4	b 12.0	b 12.5	b 12.7
	<b>T</b>	a 8.5	a 8.7	a 8.8	a 8.5	a 8.6	a 9.3
	<b>Overall</b>	c 16.0	c 15.8	c 17.8	b 11.3	b 11.7	b 11.6
<b>INTERSECTION</b>		b <b>13.9</b>	b <b>14.8</b>	b <b>14.9</b>	b <b>10.4</b>	b <b>10.7</b>	b <b>10.8</b>

**TABLE C-1  
PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE  
Croton Expy Northbound Ramp and Municipal Place**

APPROACH		AM PEAK HOUR			PM PEAK HOUR		
		2023	2026	2026	2023	2026	2026
		EXISTING	NO-BUILD	BUILD	EXISTING	NO-BUILD	BUILD
		LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)
<b>Croton Expy Northbound Ramp</b>							
<b>NB</b>	<b>LTR</b>	b 10.8	b 11.4	b 11.5	b 11.4	b 11.9	b 13.7
<b>Municipal Place</b>							
<b>EB</b>	<b>L</b>	a 9.3	a 9.5	a 9.5	a 8.4	a 8.5	a 8.5
	<b>T</b>	a 0.1	a 0.2	a 0.3	a 0.1	a 0.2	a 0.2
	<b>Overall</b>	a 0.7	a 0.7	a 1.2	a 0.9	a 1.1	a 1.1
<b>WB</b>	<b>TR</b>	- 0.0	- 0.0	- 0.0	- 0.0	- 0.0	- 0.0
<b>INTERSECTION</b>		a 2.6	a 2.9	a 3.0	a 3.8	a 4.0	a 4.9



**TABLE C-1**  
**PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE**  
**South Riverside and Municipal Place**

<b>APPROACH</b>		<b>AM PEAK HOUR</b>			<b>PM PEAK HOUR</b>		
		<b>2023</b>	<b>2026</b>	<b>2026</b>	<b>2023</b>	<b>2026</b>	<b>2026</b>
		<b>EXISTING</b>	<b>NO-BUILD</b>	<b>BUILD</b>	<b>EXISTING</b>	<b>NO-BUILD</b>	<b>BUILD</b>
		<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>
<b>South Riverside Ave</b>							
<b>NB</b>	<b>TOTAL</b>	D 36.6	D 35.8	D 35.8	D 36.0	D 35.1	D 35.1
<b>SB</b>	<b>TOTAL</b>	D 36.9	D 35.9	D 35.9	C 32.3	C 31.1	C 31.1
<b>Municipal Place</b>							
<b>EB</b>	<b>LT</b>	A 5.9	A 6.7	A 6.8	A 6.9	A 7.9	A 7.9
	<b>R</b>	A 5.1	A 5.8	A 5.8	A 6.0	A 6.8	A 6.8
	<b>Overall</b>	A 5.6	A 6.4	A 6.5	A 6.6	A 7.5	A 7.6
<b>WB</b>	<b>TOTAL</b>	A 6.0	A 6.9	A 6.9	A 6.9	A 8.0	A 8.0
<b>INTERSECTION</b>		B 17.3	B 17.7	B 17.6	B 17.1	B 17.5	B 17.4

**TABLE C-1  
PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE  
Site Driveway and Half Moon Bay Drive**

<b>APPROACH</b>		<b>AM PEAK HOUR</b>			<b>PM PEAK HOUR</b>		
		<b>2023</b>	<b>2026</b>	<b>2026</b>	<b>2023</b>	<b>2026</b>	<b>2026</b>
		<b>EXISTING</b>	<b>NO-BUILD</b>	<b>BUILD</b>	<b>EXISTING</b>	<b>NO-BUILD</b>	<b>BUILD</b>
		<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>	<b>LOS DELAY (sec)</b>
<b>Site Driveway</b>							
<b>NB</b>	<b>LR</b>	a 9.1	a 9.2	a 9.6	a 9.6	a 9.7	a 10.0
<b>Half Moon Bay Drive</b>							
<b>EB</b>	<b>TR</b>	- 0.0	- 0.0	- 0.0	- 0.0	- 0.0	- 0.0
<b>WB</b>	<b>LT</b>	- 0.0	- 0.0	- 0.0	- 0.0	- 0.0	- 0.0
<b>INTERSECTION</b>		a <b>1.0</b>	a <b>0.7</b>	a <b>3.9</b>	a <b>1.4</b>	a <b>1.4</b>	a <b>1.5</b>

APPENDIX D

CAPACITY ANALYSIS SHEETS

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Vol, veh/h	0	48	15	341	51	0	0	0	0	173	2	9
Future Vol, veh/h	0	48	15	341	51	0	0	0	0	173	2	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	15	27	4	6	0	0	0	0	9	0	0
Mvmt Flow	0	54	17	383	57	0	0	0	0	194	2	10
Number of Lanes	0	1	0	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	9	16	11.2
HCM LOS	A	C	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	94%
Vol Thru, %	76%	0%	100%	1%
Vol Right, %	24%	0%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	341	51	184
LT Vol	0	341	0	173
Through Vol	48	0	51	2
RT Vol	15	0	0	9
Lane Flow Rate	71	383	57	207
Geometry Grp	4a	5	5	2
Degree of Util (X)	0.104	0.609	0.084	0.319
Departure Headway (Hd)	5.275	5.718	5.249	5.549
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	672	628	678	645
Service Time	3.366	3.485	3.016	3.611
HCM Lane V/C Ratio	0.106	0.61	0.084	0.321
HCM Control Delay, s/veh	9	17.1	8.5	11.2
HCM Lane LOS	A	C	A	B
HCM 95th-tile Q	0.3	4.1	0.3	1.4

HCM 7th TWSC  
 2: Croton Expy NB Ramp & Municipal Place

03/27/2024

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔				
Traffic Vol, veh/h	13	208	0	0	372	82	21	0	180	0	0	0
Future Vol, veh/h	13	208	0	0	372	82	21	0	180	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	39	8	0	0	4	11	5	0	6	0	0	0
Mvmt Flow	14	226	0	0	404	89	23	0	196	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	493	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.88	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.59	-	-
Pot Cap-1 Maneuver	846	0	0
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	846	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0.69	0	10.79
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	839	212	-	-	-
HCM Lane V/C Ratio	0.26	0.017	-	-	-
HCM Control Delay (s/veh)	10.8	9.3	0.1	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	1	0.1	-	-	-

HCM 7th TWSC  
 4: Site Driveway & Half Moon Bay Drive

03/27/2024

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	45	15	0	50	13	0
Future Vol, veh/h	45	15	0	50	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	49	16	0	54	14	0


















Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	65	0	111
Stage 1	-	-	-	-	57
Stage 2	-	-	-	-	54
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1537	-	885
Stage 1	-	-	-	-	965
Stage 2	-	-	-	-	968
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1537	-	885
Mov Cap-2 Maneuver	-	-	-	-	885
Stage 1	-	-	-	-	965
Stage 2	-	-	-	-	968

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.13
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	885	-	-	1537	-
HCM Lane V/C Ratio	0.016	-	-	-	-
HCM Control Delay (s/veh)	9.1	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

03/27/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	219	120	6	252	40	85	68	9	40	89	115
Future Volume (veh/h)	48	219	120	6	252	40	85	68	9	40	89	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1811	1767	1900	1841	1900	1737	1870	1737	1900	1900	1856
Adj Flow Rate, veh/h	56	255	140	7	293	47	99	79	10	47	103	134
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	6	9	0	4	0	11	2	11	0	0	3
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	215	945	1030	48	1056	167	163	116	12	88	141	162
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.20	0.20	0.20	0.20	0.20	0.20
Unsig. Movement Delay												
Ln Grp Delay, s/veh	5.9	0.0	5.1	6.0	0.0	0.0	36.6	0.0	0.0	36.9	0.0	0.0
Ln Grp LOS	A		A	A			D			D		
Approach Vol, veh/h		451			347			188			284	
Approach Delay, s/veh		5.6			6.0			36.6			36.9	
Approach LOS		A			A			D			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		7.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			23.1		66.9		23.1		66.9			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			40.0		40.0		40.0		40.0			
Max Allow Headway (MAH), s			5.6		5.0		5.4		5.3			
Max Q Clear (g_c+I1), s			17.0		7.8		16.2		8.7			
Green Ext Time (g_e), s			1.1		2.6		1.8		2.3			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.00		0.00		0.00		0.00			
<b>Left-Turn Movement Data</b>												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			505		243		203		10			
<b>Through Movement Data</b>												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			577		1374		701		1536			
<b>Right-Turn Movement Data</b>												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			61		1497		808		242			
<b>Left Lane Group Data</b>												
Assigned Mvmt		0	5	0	7	0	1	0	3			

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

03/27/2024

Lane Assignment	L+T+R		L+T		L+T+R		L+T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	188	0	311	0	284	0	347
Grp Sat Flow (s), veh/h/ln	0	1143	0	1617	0	1711	0	1788
Q Serve Time (g_s), s	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	15.0	0.0	5.8	0.0	14.2	0.0	6.7
Perm LT Sat Flow (s_l), veh/h/ln	0	1161	0	1057	0	1329	0	1005
Shared LT Sat Flow (s_sh), veh/h/ln	0	961	0	1795	0	1713	0	0
Perm LT Eff Green (g_p), s	0.0	18.1	0.0	61.9	0.0	18.1	0.0	61.9
Perm LT Serve Time (g_u), s	0.0	3.9	0.0	55.2	0.0	3.1	0.0	56.1
Perm LT Q Serve Time (g_ps), s	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	1.8	0.0	9.1	0.0	5.0	0.0	44.4
Serve Time pre Blk (g_fs), s	0.0	1.8	0.0	5.8	0.0	5.0	0.0	6.7
Prop LT Inside Lane (P_L)	0.00	0.53	0.00	0.18	0.00	0.17	0.00	0.02
Lane Grp Cap (c), veh/h	0	291	0	1159	0	391	0	1271
V/C Ratio (X)	0.00	0.65	0.00	0.27	0.00	0.73	0.00	0.27
Avail Cap (c_a), veh/h	0	630	0	1159	0	791	0	1271
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.2	0.0	5.3	0.0	34.3	0.0	5.4
Incr Delay (d2), s/veh	0.0	2.4	0.0	0.6	0.0	2.6	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	36.6	0.0	5.9	0.0	36.9	0.0	6.0
1st-Term Q (Q1), veh/ln	0.0	3.9	0.0	1.8	0.0	5.8	0.0	2.1
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.1	0.0	2.0	0.0	6.1	0.0	2.3
%ile Storage Ratio (RQ%)	0.00	0.38	0.00	0.40	0.00	0.72	0.00	0.14
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Middle Lane Group Data

Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

03/27/2024

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	R							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	140	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1497	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.05	0.00	1.00	0.00	0.47	0.00	0.14
Lane Grp Cap (c), veh/h	0	0	0	1030	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1030	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Intersection Summary

HCM 7th Control Delay, s/veh	17.3
HCM 7th LOS	B

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Vol, veh/h	0	49	13	360	65	0	0	0	0	182	2	11
Future Vol, veh/h	0	49	13	360	65	0	0	0	0	182	2	11
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	15	27	4	6	0	0	0	0	9	0	0
Mvmt Flow	0	55	15	404	73	0	0	0	0	204	2	12
Number of Lanes	0	1	0	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	9.1	17.1	11.6
HCM LOS	A	C	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	93%
Vol Thru, %	79%	0%	100%	1%
Vol Right, %	21%	0%	0%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	360	65	195
LT Vol	0	360	0	182
Through Vol	49	0	65	2
RT Vol	13	0	0	11
Lane Flow Rate	70	404	73	219
Geometry Grp	4a	5	5	2
Degree of Util (X)	0.106	0.647	0.107	0.342
Departure Headway (Hd)	5.477	5.759	5.289	5.618
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	658	623	672	635
Service Time	3.477	3.534	3.065	3.688
HCM Lane V/C Ratio	0.106	0.648	0.109	0.345
HCM Control Delay, s/veh	9.1	18.6	8.7	11.6
HCM Lane LOS	A	C	A	B
HCM 95th-tile Q	0.4	4.7	0.4	1.5

HCM 7th TWSC  
2: Croton Expy NB Ramp & Municipal Place

03/28/2024

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔				
Traffic Vol, veh/h	13	219	0	0	393	88	33	0	190	0	0	0
Future Vol, veh/h	13	219	0	0	393	88	33	0	190	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	39	8	0	0	4	11	5	0	6	0	0	0
Mvmt Flow	14	238	0	0	427	96	36	0	207	0	0	0

Major/Minor	Major1		Major2			Minor1			
Conflicting Flow All	523	0	-	-	-	0	480	789	119
Stage 1	-	-	-	-	-	-	266	266	-
Stage 2	-	-	-	-	-	-	214	523	-
Critical Hdwy	4.88	-	-	-	-	-	6.9	6.5	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-	5.9	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.9	5.5	-
Follow-up Hdwy	2.59	-	-	-	-	-	3.55	4	3.36
Pot Cap-1 Maneuver	821	-	0	0	-	-	507	325	898
Stage 1	-	-	0	0	-	-	745	692	-
Stage 2	-	-	0	0	-	-	792	534	-
Platoon blocked, %		-							
Mov Cap-1 Maneuver	821	-	-	-	-	-	498	0	898
Mov Cap-2 Maneuver	-	-	-	-	-	-	498	0	-
Stage 1	-	-	-	-	-	-	732	0	-
Stage 2	-	-	-	-	-	-	792	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0.68	0	11.42
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	802	202	-	-	-
HCM Lane V/C Ratio	0.302	0.017	-	-	-
HCM Control Delay (s/veh)	11.4	9.5	0.2	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	1.3	0.1	-	-	-

HCM 7th TWSC  
 4: Site Driveway & Half Moon Bay Drive

03/28/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	47	30	0	52	10	0
Future Vol, veh/h	47	30	0	52	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	51	33	0	57	11	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	84	0	124
Stage 1	-	-	-	-	67
Stage 2	-	-	-	-	57
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1513	-	871
Stage 1	-	-	-	-	955
Stage 2	-	-	-	-	966
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1513	-	871
Mov Cap-2 Maneuver	-	-	-	-	871
Stage 1	-	-	-	-	955
Stage 2	-	-	-	-	966

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.18
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	871	-	-	1513	-
HCM Lane V/C Ratio	0.012	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

03/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔			↕			↔	
Traffic Volume (veh/h)	50	232	125	6	270	43	89	77	9	42	106	120
Future Volume (veh/h)	50	232	125	6	270	43	89	77	9	42	106	120
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1811	1767	1900	1841	1900	1737	1870	1737	1900	1900	1856
Adj Flow Rate, veh/h	58	270	145	7	314	50	103	90	10	49	123	140
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	6	9	0	4	0	11	2	11	0	0	3
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	205	921	1001	47	1028	161	164	129	12	89	165	169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.22	0.22	0.22	0.22	0.22	0.22
Unsig. Movement Delay												
Ln Grp Delay, s/veh	6.7	0.0	5.8	6.9	0.0	0.0	35.8	0.0	0.0	35.9	0.0	0.0
Ln Grp LOS	A		A	A			D			D		
Approach Vol, veh/h		473			371			203			312	
Approach Delay, s/veh		6.4			6.9			35.8			35.9	
Approach LOS		A			A			D			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		7.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			24.8		65.2		24.8		65.2			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			40.0		40.0		40.0		40.0			
Max Allow Headway (MAH), s			5.6		5.0		5.4		5.3			
Max Q Clear (g_c+I1), s			18.6		8.6		17.5		9.8			
Green Ext Time (g_e), s			1.2		2.8		2.0		2.5			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.00		0.00		0.00		0.00			
<b>Left-Turn Movement Data</b>												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			473		236		192		9			
<b>Through Movement Data</b>												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			585		1378		749		1538			
<b>Right-Turn Movement Data</b>												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			55		1497		766		241			
<b>Left Lane Group Data</b>												
Assigned Mvmt	0	5	0	7	0	1	0	3				

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

03/28/2024

Lane Assignment	L+T+R		L+T		L+T+R		L+T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	203	0	328	0	312	0	371
Grp Sat Flow (s), veh/h/ln	0	1113	0	1613	0	1708	0	1789
Q Serve Time (g_s), s	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	16.6	0.0	6.6	0.0	15.5	0.0	7.8
Perm LT Sat Flow (s_l), veh/h/ln	0	1134	0	1034	0	1315	0	987
Shared LT Sat Flow (s_sh), veh/h/ln	0	922	0	1795	0	1700	0	0
Perm LT Eff Green (g_p), s	0.0	19.8	0.0	60.2	0.0	19.8	0.0	60.2
Perm LT Serve Time (g_u), s	0.0	4.3	0.0	52.4	0.0	3.2	0.0	53.6
Perm LT Q Serve Time (g_ps), s	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	1.9	0.0	9.3	0.0	5.5	0.0	43.1
Serve Time pre Blk (g_fs), s	0.0	1.9	0.0	6.6	0.0	5.5	0.0	7.8
Prop LT Inside Lane (P_L)	0.00	0.51	0.00	0.18	0.00	0.16	0.00	0.02
Lane Grp Cap (c), veh/h	0	306	0	1126	0	423	0	1236
V/C Ratio (X)	0.00	0.66	0.00	0.29	0.00	0.74	0.00	0.30
Avail Cap (c_a), veh/h	0	616	0	1126	0	793	0	1236
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	33.3	0.0	6.0	0.0	33.4	0.0	6.2
Incr Delay (d2), s/veh	0.0	2.5	0.0	0.7	0.0	2.5	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	35.8	0.0	6.7	0.0	35.9	0.0	6.9
1st-Term Q (Q1), veh/ln	0.0	4.2	0.0	2.2	0.0	6.3	0.0	2.5
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.4	0.0	2.4	0.0	6.6	0.0	2.7
%ile Storage Ratio (RQ%)	0.00	0.41	0.00	0.46	0.00	0.96	0.00	0.17
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Middle Lane Group Data</b>								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

03/28/2024

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	R							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	145	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1497	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.05	0.00	1.00	0.00	0.45	0.00	0.13
Lane Grp Cap (c), veh/h	0	0	0	1001	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1001	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Intersection Summary

HCM 7th Control Delay, s/veh	17.7
HCM 7th LOS	B

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Vol, veh/h	0	69	71	360	62	0	0	0	0	182	2	11
Future Vol, veh/h	0	69	71	360	62	0	0	0	0	182	2	11
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	15	27	4	6	0	0	0	0	9	0	0
Mvmt Flow	0	78	80	404	70	0	0	0	0	204	2	12
Number of Lanes	0	1	0	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	10	17.8	12.2
HCM LOS	A	C	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	93%
Vol Thru, %	49%	0%	100%	1%
Vol Right, %	51%	0%	0%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	360	62	195
LT Vol	0	360	0	182
Through Vol	69	0	62	2
RT Vol	71	0	0	11
Lane Flow Rate	157	404	70	219
Geometry Grp	4a	5	5	2
Degree of Util (X)	0.233	0.658	0.104	0.359
Departure Headway (Hd)	5.33	5.972	5.501	5.894
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	676	611	656	613
Service Time	3.344	3.672	3.201	3.894
HCM Lane V/C Ratio	0.232	0.661	0.107	0.357
HCM Control Delay, s/veh	10	19.4	8.8	12.2
HCM Lane LOS	A	C	A	B
HCM 95th-tile Q	0.9	4.9	0.3	1.6



HCM 7th TWSC  
 2: Croton Expy NB Ramp & Municipal Place

06/13/2024

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔				
Traffic Vol, veh/h	25	227	0	0	393	88	31	0	190	0	0	0
Future Vol, veh/h	25	227	0	0	393	88	31	0	190	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	39	8	0	0	4	11	5	0	6	0	0	0
Mvmt Flow	27	247	0	0	427	96	34	0	207	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	523	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.88	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.59	-	-
Pot Cap-1 Maneuver	821	0	0
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	821	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	1.2	0	11.53
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	790	357	-	-	-
HCM Lane V/C Ratio	0.304	0.033	-	-	-
HCM Control Delay (s/veh)	11.5	9.5	0.3	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	1.3	0.1	-	-	-

HCM 7th TWSC  
 4: Site Driveway & Half Moon Bay Drive

06/13/2024

Intersection						
Int Delay, s/veh	3.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	47	27	0	52	87	0
Future Vol, veh/h	47	27	0	52	87	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	51	29	0	57	95	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	80	0	122 66
Stage 1	-	-	-	-	66 -
Stage 2	-	-	-	-	57 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1517	-	873 998
Stage 1	-	-	-	-	957 -
Stage 2	-	-	-	-	966 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1517	-	873 998
Mov Cap-2 Maneuver	-	-	-	-	873 -
Stage 1	-	-	-	-	957 -
Stage 2	-	-	-	-	966 -



















Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.62
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	873	-	-	1517	-
HCM Lane V/C Ratio	0.108	-	-	-	-
HCM Control Delay (s/veh)	9.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

06/13/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	240	125	6	270	43	89	77	9	42	106	120
Future Volume (veh/h)	50	240	125	6	270	43	89	77	9	42	106	120
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1811	1767	1900	1841	1900	1737	1870	1737	1900	1900	1856
Adj Flow Rate, veh/h	58	279	145	7	314	50	103	90	10	49	123	140
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	6	9	0	4	0	11	2	11	0	0	3
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	200	929	1001	47	1028	161	164	129	12	89	165	169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.22	0.22	0.22	0.22	0.22	0.22
Unsig. Movement Delay												
Ln Grp Delay, s/veh	6.8	0.0	5.8	6.9	0.0	0.0	35.8	0.0	0.0	35.9	0.0	0.0
Ln Grp LOS	A		A	A			D			D		
Approach Vol, veh/h		482			371			203			312	
Approach Delay, s/veh		6.5			6.9			35.8			35.9	
Approach LOS		A			A			D			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		7.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			24.8		65.2		24.8		65.2			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			40.0		40.0		40.0		40.0			
Max Allow Headway (MAH), s			5.6		5.0		5.4		5.3			
Max Q Clear (g_c+I1), s			18.6		8.8		17.5		9.8			
Green Ext Time (g_e), s			1.2		2.8		2.0		2.5			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.00		0.00		0.00		0.00			
<b>Left-Turn Movement Data</b>												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			473		229		192		9			
<b>Through Movement Data</b>												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			585		1390		749		1538			
<b>Right-Turn Movement Data</b>												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			55		1497		766		241			
<b>Left Lane Group Data</b>												
Assigned Mvmt	0	5	0	7	0	1	0	3				

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

06/13/2024

Lane Assignment	L+T+R		L+T		L+T+R		L+T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	203	0	337	0	312	0	371
Grp Sat Flow (s), veh/h/ln	0	1113	0	1619	0	1708	0	1788
Q Serve Time (g_s), s	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	16.6	0.0	6.8	0.0	15.5	0.0	7.8
Perm LT Sat Flow (s_l), veh/h/ln	0	1134	0	1034	0	1315	0	978
Shared LT Sat Flow (s_sh), veh/h/ln	0	922	0	1796	0	1700	0	0
Perm LT Eff Green (g_p), s	0.0	19.8	0.0	60.2	0.0	19.8	0.0	60.2
Perm LT Serve Time (g_u), s	0.0	4.3	0.0	52.4	0.0	3.2	0.0	53.3
Perm LT Q Serve Time (g_ps), s	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	1.9	0.0	9.6	0.0	5.5	0.0	43.1
Serve Time pre Blk (g_fs), s	0.0	1.9	0.0	6.8	0.0	5.5	0.0	7.8
Prop LT Inside Lane (P_L)	0.00	0.51	0.00	0.17	0.00	0.16	0.00	0.02
Lane Grp Cap (c), veh/h	0	306	0	1129	0	423	0	1236
V/C Ratio (X)	0.00	0.66	0.00	0.30	0.00	0.74	0.00	0.30
Avail Cap (c_a), veh/h	0	616	0	1129	0	793	0	1236
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	33.3	0.0	6.1	0.0	33.4	0.0	6.2
Incr Delay (d2), s/veh	0.0	2.5	0.0	0.7	0.0	2.5	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	35.8	0.0	6.8	0.0	35.9	0.0	6.9
1st-Term Q (Q1), veh/ln	0.0	4.2	0.0	2.2	0.0	6.3	0.0	2.5
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.4	0.0	2.4	0.0	6.6	0.0	2.7
%ile Storage Ratio (RQ%)	0.00	0.41	0.00	0.48	0.00	0.96	0.00	0.17
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Middle Lane Group Data

Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

06/13/2024

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment				R				
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	145	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1497	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.05	0.00	1.00	0.00	0.45	0.00	0.13
Lane Grp Cap (c), veh/h	0	0	0	1001	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1001	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	17.6
HCM 7th LOS	B

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Vol, veh/h	0	70	31	224	59	0	0	0	0	131	3	13
Future Vol, veh/h	0	70	31	224	59	0	0	0	0	131	3	13
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	3	7	1	7	0	0	0	0	3	0	31
Mvmt Flow	0	80	36	257	68	0	0	0	0	151	3	15
Number of Lanes	0	1	0	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.6	11.3	9.9
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	89%
Vol Thru, %	69%	0%	100%	2%
Vol Right, %	31%	0%	0%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	101	224	59	147
LT Vol	0	224	0	131
Through Vol	70	0	59	3
RT Vol	31	0	0	13
Lane Flow Rate	116	257	68	169
Geometry Grp	4a	5	5	2
Degree of Util (X)	0.152	0.398	0.097	0.242
Departure Headway (Hd)	4.721	5.566	5.166	5.165
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	757	646	692	694
Service Time	2.77	3.309	2.908	3.207
HCM Lane V/C Ratio	0.153	0.398	0.098	0.244
HCM Control Delay, s/veh	8.6	12	8.5	9.9
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.5	1.9	0.3	0.9

HCM 7th TWSC  
 2: Croton Expy NB Ramp & Municipal Place

03/27/2024

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕				
Traffic Vol, veh/h	18	183	0	0	267	168	19	1	276	0	0	0
Future Vol, veh/h	18	183	0	0	267	168	19	1	276	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	3	0	0	2	4	11	0	3	0	0	0
Mvmt Flow	20	203	0	0	297	187	21	1	307	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	483	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1090	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1090	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0.87	0	11.38
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	891	322	-	-	-
HCM Lane V/C Ratio	0.369	0.018	-	-	-
HCM Control Delay (s/veh)	11.4	8.4	0.1	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	1.7	0.1	-	-	-

HCM 7th TWSC  
4: Site Driveway & Half Moon Bay Drive

03/27/2024

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	65	7	0	93	8	0
Future Vol, veh/h	65	7	0	93	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	71	8	0	101	9	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	78	0	176
Stage 1	-	-	-	-	74
Stage 2	-	-	-	-	101
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1520	-	814
Stage 1	-	-	-	-	948
Stage 2	-	-	-	-	923
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1520	-	814
Mov Cap-2 Maneuver	-	-	-	-	814
Stage 1	-	-	-	-	948
Stage 2	-	-	-	-	923

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.47
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	814	-	-	1520	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s/veh)	9.5	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-



HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

03/27/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔			↕			↔	
Traffic Volume (veh/h)	80	228	147	12	250	63	109	133	10	45	95	75
Future Volume (veh/h)	80	228	147	12	250	63	109	133	10	45	95	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h ln	1885	1856	1856	1900	1841	1900	1870	1900	1900	1900	1885	1885
Adj Flow Rate, veh/h	86	245	158	13	269	68	117	143	11	48	102	81
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	3	0	4	0	2	0	0	0	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	292	806	1044	59	922	226	180	185	13	102	187	130
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.22	0.22	0.22	0.22	0.22	0.22
Unsig. Movement Delay												
Ln Grp Delay, s/veh	6.9	0.0	6.0	6.9	0.0	0.0	36.0	0.0	0.0	32.3	0.0	0.0
Ln Grp LOS	A		A	A			D			C		
Approach Vol, veh/h		489			350			271			231	
Approach Delay, s/veh		6.6			6.9			36.0			32.3	
Approach LOS		A			A			D			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		7.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			25.2		64.8		25.2		64.8			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			40.0		40.0		40.0		40.0			
Max Allow Headway (MAH), s			5.4		5.0		5.4		5.4			
Max Q Clear (g_c+I1), s			18.6		8.6		13.1		9.4			
Green Ext Time (g_e), s			1.6		2.9		1.4		2.4			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.00		0.00		0.00		0.00			
<b>Left-Turn Movement Data</b>												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			548		364		238		26			
<b>Through Movement Data</b>												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			825		1213		830		1388			
<b>Right-Turn Movement Data</b>												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			58		1572		577		341			
<b>Left Lane Group Data</b>												
Assigned Mvmt	0	5	0	7	0	1	0	3				

HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

03/27/2024

Lane Assignment	L+T+R		L+T		L+T+R		L+T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	271	0	331	0	231	0	350
Grp Sat Flow (s), veh/h/ln	0	1431	0	1577	0	1645	0	1755
Q Serve Time (g_s), s	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	16.6	0.0	6.6	0.0	11.1	0.0	7.4
Perm LT Sat Flow (s_l), veh/h/ln	0	1220	0	1060	0	1252	0	998
Shared LT Sat Flow (s_sh), veh/h/ln	0	1257	0	1832	0	1589	0	0
Perm LT Eff Green (g_p), s	0.0	20.2	0.0	59.8	0.0	20.2	0.0	59.8
Perm LT Serve Time (g_u), s	0.0	9.1	0.0	52.4	0.0	3.6	0.0	53.2
Perm LT Q Serve Time (g_ps), s	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	5.7	0.0	5.7	0.0	35.1
Serve Time pre Blk (g_fs), s	0.0	1.7	0.0	5.7	0.0	5.7	0.0	7.4
Prop LT Inside Lane (P_L)	0.00	0.43	0.00	0.26	0.00	0.21	0.00	0.04
Lane Grp Cap (c), veh/h	0	379	0	1098	0	418	0	1207
V/C Ratio (X)	0.00	0.72	0.00	0.30	0.00	0.55	0.00	0.29
Avail Cap (c_a), veh/h	0	713	0	1098	0	772	0	1207
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	33.5	0.0	6.2	0.0	31.2	0.0	6.3
Incr Delay (d2), s/veh	0.0	2.5	0.0	0.7	0.0	1.1	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	36.0	0.0	6.9	0.0	32.3	0.0	6.9
1st-Term Q (Q1), veh/ln	0.0	5.5	0.0	2.2	0.0	4.4	0.0	2.4
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.2	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.8	0.0	2.4	0.0	4.5	0.0	2.6
%ile Storage Ratio (RQ%)	0.00	0.54	0.00	0.47	0.00	0.52	0.00	0.16
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data

Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

03/27/2024

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	R							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	158	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1572	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.04	0.00	1.00	0.00	0.35	0.00	0.19
Lane Grp Cap (c), veh/h	0	0	0	1044	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1044	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	17.1
HCM 7th LOS	B

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↑						↔	
Traffic Vol, veh/h	0	79	49	236	65	0	0	0	0	139	3	15
Future Vol, veh/h	0	79	49	236	65	0	0	0	0	139	3	15
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	3	7	1	7	0	0	0	0	3	0	31
Mvmt Flow	0	91	56	271	75	0	0	0	0	160	3	17
Number of Lanes	0	1	0	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	9	11.7	10.2
HCM LOS	A	B	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	89%
Vol Thru, %	62%	0%	100%	2%
Vol Right, %	38%	0%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	236	65	157
LT Vol	0	236	0	139
Through Vol	79	0	65	3
RT Vol	49	0	0	15
Lane Flow Rate	147	271	75	180
Geometry Grp	4a	5	5	2
Degree of Util (X)	0.194	0.424	0.109	0.264
Departure Headway (Hd)	4.742	5.633	5.233	5.273
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	752	637	682	679
Service Time	2.801	3.386	2.985	3.325
HCM Lane V/C Ratio	0.195	0.425	0.11	0.265
HCM Control Delay, s/veh	9	12.5	8.6	10.2
HCM Lane LOS	A	B	A	B
HCM 95th-tile Q	0.7	2.1	0.4	1.1

HCM 7th TWSC  
2: Croton Expy NB Ramp & Municipal Place

03/28/2024

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑			↑↔			↔				
Traffic Vol, veh/h	23	195	0	0	281	178	23	1	291	0	0	0
Future Vol, veh/h	23	195	0	0	281	178	23	1	291	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	3	0	0	2	4	11	0	3	0	0	0
Mvmt Flow	26	217	0	0	312	198	26	1	323	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	510	0	- - - 0 424 778 108
Stage 1	-	-	- - - 268 268 -
Stage 2	-	-	- - - 156 510 -
Critical Hdwy	4.1	-	- - - 7.02 6.5 6.96
Critical Hdwy Stg 1	-	-	- - - 6.02 5.5 -
Critical Hdwy Stg 2	-	-	- - - 6.02 5.5 -
Follow-up Hdwy	2.2	-	- - - 3.61 4 3.33
Pot Cap-1 Maneuver	1065	- 0 0	- - 536 330 921
Stage 1	-	- 0 0	- - 727 691 -
Stage 2	-	- 0 0	- - 830 541 -
Platoon blocked, %	-	-	- -
Mov Cap-1 Maneuver	1065	- - -	- - 522 0 921
Mov Cap-2 Maneuver	-	- - -	- - 522 0 -
Stage 1	-	- - -	- - 708 0 -
Stage 2	-	- - -	- - 830 0 -

Approach	EB	WB	NB
HCM Control Delay, s/v	1.05	0	11.86
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	873	380	-	-	-
HCM Lane V/C Ratio	0.401	0.024	-	-	-
HCM Control Delay (s/veh)	11.9	8.5	0.2	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	2	0.1	-	-	-

HCM 7th TWSC  
4: Site Driveway & Half Moon Bay Drive

03/28/2024

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	68	11	0	97	30	0
Future Vol, veh/h	68	11	0	97	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	74	12	0	105	33	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	86	0	185 80
Stage 1	-	-	-	-	80 -
Stage 2	-	-	-	-	105 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1510	-	804 980
Stage 1	-	-	-	-	943 -
Stage 2	-	-	-	-	919 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1510	-	804 980
Mov Cap-2 Maneuver	-	-	-	-	804 -
Stage 1	-	-	-	-	943 -
Stage 2	-	-	-	-	919 -

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.67
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	804	-	-	1510	-
HCM Lane V/C Ratio	0.041	-	-	-	-
HCM Control Delay (s/veh)	9.7	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

03/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔			↕			↔	
Traffic Volume (veh/h)	84	244	154	13	265	66	114	152	10	48	108	78
Future Volume (veh/h)	84	244	154	13	265	66	114	152	10	48	108	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1885	1856	1856	1900	1841	1900	1870	1900	1900	1900	1885	1885
Adj Flow Rate, veh/h	90	262	166	14	285	71	123	163	11	52	116	84
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	3	0	4	0	2	0	0	0	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	279	786	1011	59	894	216	185	208	13	106	209	133
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.25	0.25	0.25	0.25	0.25	0.25
Unsig. Movement Delay												
Ln Grp Delay, s/veh	7.9	0.0	6.8	8.0	0.0	0.0	35.1	0.0	0.0	31.1	0.0	0.0
Ln Grp LOS	A		A	A			D			C		
Approach Vol, veh/h		518			370			297			252	
Approach Delay, s/veh		7.5			8.0			35.1			31.1	
Approach LOS		A			A			D			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		7.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			27.1		62.9		27.1		62.9			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			40.0		40.0		40.0		40.0			
Max Allow Headway (MAH), s			5.5		5.0		5.4		5.4			
Max Q Clear (g_c+I1), s			20.4		9.6		14.1		10.4			
Green Ext Time (g_e), s			1.8		3.1		1.6		2.5			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.01		0.00		0.00		0.00			
<b>Left-Turn Movement Data</b>												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			520		356		235		27			
<b>Through Movement Data</b>												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			844		1223		848		1392			
<b>Right-Turn Movement Data</b>												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			52		1572		542		337			
<b>Left Lane Group Data</b>												
Assigned Mvmt	0	5	0	7	0	1	0	3				

HCM 7th Signalized Intersection Capacity Analysis  
 3: S Riverside Ave & Municipal Place

03/28/2024

Lane Assignment	L+T+R		L+T		L+T+R		L+T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	297	0	352	0	252	0	370
Grp Sat Flow (s), veh/h/ln	0	1416	0	1579	0	1625	0	1755
Q Serve Time (g_s), s	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	18.4	0.0	7.6	0.0	12.1	0.0	8.4
Perm LT Sat Flow (s_l), veh/h/ln	0	1201	0	1042	0	1230	0	975
Shared LT Sat Flow (s_sh), veh/h/ln	0	1225	0	1832	0	1555	0	0
Perm LT Eff Green (g_p), s	0.0	22.1	0.0	57.9	0.0	22.1	0.0	57.9
Perm LT Serve Time (g_u), s	0.0	10.1	0.0	49.4	0.0	3.8	0.0	50.3
Perm LT Q Serve Time (g_ps), s	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	1.9	0.0	5.8	0.0	6.0	0.0	34.2
Serve Time pre Blk (g_fs), s	0.0	1.9	0.0	5.8	0.0	6.0	0.0	8.4
Prop LT Inside Lane (P_L)	0.00	0.41	0.00	0.26	0.00	0.21	0.00	0.04
Lane Grp Cap (c), veh/h	0	405	0	1065	0	448	0	1170
V/C Ratio (X)	0.00	0.73	0.00	0.33	0.00	0.56	0.00	0.32
Avail Cap (c_a), veh/h	0	707	0	1065	0	767	0	1170
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	32.5	0.0	7.1	0.0	30.0	0.0	7.2
Incr Delay (d2), s/veh	0.0	2.6	0.0	0.8	0.0	1.1	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	35.1	0.0	7.9	0.0	31.1	0.0	8.0
1st-Term Q (Q1), veh/ln	0.0	6.0	0.0	2.6	0.0	4.7	0.0	2.8
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.2	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.3	0.0	2.9	0.0	4.9	0.0	3.1
%ile Storage Ratio (RQ%)	0.00	0.59	0.00	0.55	0.00	0.55	0.00	0.19
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data

Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

03/28/2024

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	R							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	166	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1572	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.04	0.00	1.00	0.00	0.33	0.00	0.19
Lane Grp Cap (c), veh/h	0	0	0	1011	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1011	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Intersection Summary

HCM 7th Control Delay, s/veh	17.5
HCM 7th LOS	B

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Vol, veh/h	0	82	58	236	113	0	0	0	0	139	3	23
Future Vol, veh/h	0	82	58	236	113	0	0	0	0	139	3	23
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	3	7	1	7	0	0	0	0	3	0	31
Mvmt Flow	0	94	67	271	130	0	0	0	0	160	3	26
Number of Lanes	0	1	0	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	9.2	11.6	10.5
HCM LOS	A	B	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	84%
Vol Thru, %	59%	0%	100%	2%
Vol Right, %	41%	0%	0%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	236	113	165
LT Vol	0	236	0	139
Through Vol	82	0	113	3
RT Vol	58	0	0	23
Lane Flow Rate	161	271	130	190
Geometry Grp	4a	5	5	2
Degree of Util (X)	0.215	0.428	0.19	0.282
Departure Headway (Hd)	4.8	5.678	5.277	5.353
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	742	632	677	668
Service Time	2.869	3.44	3.039	3.414
HCM Lane V/C Ratio	0.217	0.429	0.192	0.284
HCM Control Delay, s/veh	9.2	12.7	9.3	10.5
HCM Lane LOS	A	B	A	B
HCM 95th-tile Q	0.8	2.1	0.7	1.2

HCM 7th TWSC  
 2: Croton Expy NB Ramp & Municipal Place

06/13/2024

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	24	196	0	0	287	178	65	1	291	0	0	0
Future Vol, veh/h	24	196	0	0	287	178	65	1	291	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	3	0	0	2	4	11	0	3	0	0	0
Mvmt Flow	27	218	0	0	319	198	72	1	323	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	517	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1059	0	0
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1059	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	1.09	0	13.73
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	805	393	-	-	-
HCM Lane V/C Ratio	0.492	0.025	-	-	-
HCM Control Delay (s/veh)	13.7	8.5	0.2	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	2.8	0.1	-	-	-

HCM 7th TWSC  
4: Site Driveway

06/13/2024

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	68	67	0	97	42	0
Future Vol, veh/h	68	67	0	97	42	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	74	73	0	105	46	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	147	0	216
Stage 1	-	-	-	-	110
Stage 2	-	-	-	-	105
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1435	-	772
Stage 1	-	-	-	-	914
Stage 2	-	-	-	-	919
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1435	-	772
Mov Cap-2 Maneuver	-	-	-	-	772
Stage 1	-	-	-	-	914
Stage 2	-	-	-	-	919

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.95
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	772	-	-	1435	-
HCM Lane V/C Ratio	0.059	-	-	-	-
HCM Control Delay (s/veh)	10	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

06/13/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔			↕			↔	
Traffic Volume (veh/h)	84	245	154	13	271	66	114	152	10	48	108	78
Future Volume (veh/h)	84	245	154	13	271	66	114	152	10	48	108	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h ln	1885	1856	1856	1900	1841	1900	1870	1900	1900	1900	1885	1885
Adj Flow Rate, veh/h	90	263	166	14	291	71	123	163	11	52	116	84
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	3	0	4	0	2	0	0	0	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	278	786	1011	58	899	213	185	208	13	106	209	133
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.25	0.25	0.25	0.25	0.25	0.25
Unsig. Movement Delay												
Ln Grp Delay, s/veh	7.9	0.0	6.8	8.0	0.0	0.0	35.1	0.0	0.0	31.1	0.0	0.0
Ln Grp LOS	A		A	A			D			C		
Approach Vol, veh/h		519			376			297			252	
Approach Delay, s/veh		7.6			8.0			35.1			31.1	
Approach LOS		A			A			D			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		7.0		8.0		8.0			
Phs Duration (G+Y+Rc), s			27.1		62.9		27.1		62.9			
Change Period (Y+Rc), s			5.0		5.0		5.0		5.0			
Max Green (Gmax), s			40.0		40.0		40.0		40.0			
Max Allow Headway (MAH), s			5.5		5.0		5.4		5.4			
Max Q Clear (g_c+I1), s			20.4		9.6		14.1		10.6			
Green Ext Time (g_e), s			1.8		3.1		1.6		2.6			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.01		0.00		0.00		0.00			
<b>Left-Turn Movement Data</b>												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			520		354		235		26			
<b>Through Movement Data</b>												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			844		1223		848		1399			
<b>Right-Turn Movement Data</b>												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			52		1572		542		332			
<b>Left Lane Group Data</b>												
Assigned Mvmt	0	5	0	7	0	1	0	3				

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

06/13/2024

Lane Assignment	L+T+R		L+T		L+T+R		L+T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	297	0	353	0	252	0	376
Grp Sat Flow (s), veh/h/ln	0	1416	0	1577	0	1625	0	1756
Q Serve Time (g_s), s	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	18.4	0.0	7.6	0.0	12.1	0.0	8.6
Perm LT Sat Flow (s_l), veh/h/ln	0	1201	0	1036	0	1230	0	974
Shared LT Sat Flow (s_sh), veh/h/ln	0	1225	0	1832	0	1555	0	0
Perm LT Eff Green (g_p), s	0.0	22.1	0.0	57.9	0.0	22.1	0.0	57.9
Perm LT Serve Time (g_u), s	0.0	10.1	0.0	49.2	0.0	3.8	0.0	50.3
Perm LT Q Serve Time (g_ps), s	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	1.9	0.0	5.8	0.0	6.0	0.0	34.5
Serve Time pre Blk (g_fs), s	0.0	1.9	0.0	5.8	0.0	6.0	0.0	8.6
Prop LT Inside Lane (P_L)	0.00	0.41	0.00	0.25	0.00	0.21	0.00	0.04
Lane Grp Cap (c), veh/h	0	405	0	1064	0	448	0	1171
V/C Ratio (X)	0.00	0.73	0.00	0.33	0.00	0.56	0.00	0.32
Avail Cap (c_a), veh/h	0	707	0	1064	0	767	0	1171
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	32.5	0.0	7.1	0.0	30.0	0.0	7.3
Incr Delay (d2), s/veh	0.0	2.6	0.0	0.8	0.0	1.1	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	35.1	0.0	7.9	0.0	31.1	0.0	8.0
1st-Term Q (Q1), veh/ln	0.0	6.0	0.0	2.6	0.0	4.7	0.0	2.9
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.2	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.3	0.0	2.9	0.0	4.9	0.0	3.1
%ile Storage Ratio (RQ%)	0.00	0.59	0.00	0.55	0.00	0.59	0.00	0.20
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Middle Lane Group Data</b>								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

# HCM 7th Signalized Intersection Capacity Analysis

## 3: S Riverside Ave & Municipal Place

06/13/2024

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	R							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	166	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1572	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.04	0.00	1.00	0.00	0.33	0.00	0.19
Lane Grp Cap (c), veh/h	0	0	0	1011	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1011	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Intersection Summary

HCM 7th Control Delay, s/veh	17.4
HCM 7th LOS	B

APPENDIX E  
ACCIDENT DATA



1027 - Monday Properties Croton-on-Hudson 3 Intersection Accident Data

CRASH NUMBER	CASE NUMBER	CASE YEAR	ACCD DATE	ACCD TIME	DN STREET	CLOSEST CROSS STREET	INTERSECTION INDICATOR	ACCIDENT TYPE	COLLISION TYPE	SEVERITY	NUMBER OF INJURIES	NUMBER OF SERIOUS INJURIES	NUMBER OF FATALITIES	NUMBER OF VEHICLES	APPARENT CONTRIBUTING FACTOR	TRAFFIC CONTROL	LIGHT CONDITION	WEATHER	ROAD SURFACE CONDITION
1	38708537	2020	2020-09-03T00:00:00	1:58 PM	MUNICIPAL PL	S RIVERSIDE AVE	AT-INTERSECTION	COLLISION WITH MOTOR VEHICLE	OVERTAKING	PROPERTY DAMAGE	0	0	0	2	V1:(NOT APPLICABLE,NOT APPLICABLE) / V2:(UNSAFE LANE CHANGE,UNKNOWN)	TRAFFIC SIGNAL	DAYLIGHT	CLEAR	DRY
2	38855860	2021	2021-01-08T00:00:00	5:55 PM	Route 9		Not an intersection crash	COLLISION WITH MOTOR VEHICLE	RIGHT ANGLE	PROPERTY DAMAGE	0	0	0	2	V1:(UNKNOWN,UNKNOWN) / V2:(NOT ENTERED,NOT ENTERED)	STOP SIGN	DARK-ROAD LIGHTED	CLEAR	DRY
3	39331430	2023	2023-03-05T00:00:00	3:48 PM	MUNICIPAL PLACE	UNITED STATES ROUTE 9	Not an intersection crash	COLLISION WITH MOTOR VEHICLE	LEFT TURN (AGAINST OTHER CAR)	PROPERTY DAMAGE	0	0	0	2	V1:(UNKNOWN,NOT ENTERED) / V2:(NOT ENTERED,NOT ENTERED)	STOP SIGN	DAYLIGHT	CLEAR	DRY
4	39853796	2023	2023-06-01T00:00:00	12:48 PM	MUNICIPAL PLACE	SOUTH RIVERSIDE AVENUE	AT-INTERSECTION	COLLISION WITH MOTOR VEHICLE	OTHER	INJURY	1	0	0	3	V1:(TRAFFIC CONTROL DEVICES DISREGARDED,NOT APPLICABLE) / V2:(NOT APPLICABLE,NOT APPLICABLE) / V3:(NOT APPLICABLE,NOT APPLICABLE)	TRAFFIC SIGNAL	DAYLIGHT	CLEAR	DRY
5	39879858	2023	2023-06-22T00:00:00	9:25 PM	MUNICIPAL PLACE	RAMP	AT-INTERSECTION	COLLISION WITH MOTOR VEHICLE	RIGHT ANGLE	INJURY	2	2	0	2	V1:(FAILURE TO YIELD RIGHT OF WAY,NOT APPLICABLE) / V2:(UNSAFE SPEED,NOT APPLICABLE)	STOP SIGN	DARK-ROAD UNLIGHTED	CLEAR	DRY

