



## MEMORANDUM

**DATE:** October 25, 2024  
**To:** Eric Perez, City of Orange  
**FROM:** Arthur Black, LSA  
**SUBJECT:** Proposed Improvements to Cannon Street

Cannon Street is a four-lane north-south street traversing approximately 3.5 miles of the eastern portion of Orange, California. South of the Orange city limits, the roadway becomes Crawford Canyon Road, narrows to two lanes, and terminates at Newport Avenue. North of the Orange city limits, the roadway becomes Imperial Highway. The City of Orange (City) is considering modifications to a portion of Cannon Street to address traffic flow and queueing concerns. The project area is a 0.6-mile segment between Serrano Avenue and Santiago Canyon Road.

The City of Orange Circulation and Mobility Element (revised December 2015) classifies Cannon Street as a Major Arterial (six lanes with a center median) from the Anaheim city limit to Santiago Canyon Road and as a Secondary Arterial (four lanes without a center median) from Santiago Canyon Road to the southern city limit. Both the intersection of Cannon Street/Serrano Avenue and Cannon Street/Santiago Canyon Road are identified as critical intersections in the Circulation and Mobility Element. Critical intersections can deviate from typical City design standards in their role regulating the flow of vehicles along City streets. Cannon Street is not included in the Orange County Congestion Management Program.

Within the project area, Cannon Street is classified as a Major Arterial, which can accommodate up to 50,700 vehicles on an average weekday at level of service D (LOS D) conditions. Although classified as a Major Arterial from the Anaheim city limit to Santiago Canyon Road, Cannon Street is configured with no more than four through lanes. A configuration of four lanes with a center median is stated in the Circulation and Mobility Element to have a daily capacity of 33,750 vehicle trips. The 2023 Traffic Flow Map (Orange County Transportation Authority August 2023) shows an average of 22,000 daily vehicle trips within the project area. These volumes were, however, collected in 2020. Traffic volume data collected in April 2023 revealed 33,096 daily vehicle trips between Serrano Avenue and Taft Avenue and 30,297 daily vehicle trips between Taft Avenue and Santiago Canyon Road. These volumes are near the capacity of the existing roadway.

This memorandum describes the project being considered by the City and discusses the potential implications of the project under the California Environmental Quality Act (CEQA).

**EXISTING CONDITIONS**

Bicycle paths and sidewalks are provided in varying conditions through the project area.

A 10-foot-wide Class I off-street bicycle path (part of the Santiago Creek Trail and Bikepath) is provided on the west side of Cannon Street between Santiago Canyon Road and the Santiago Creek Trail and Bikepath bicycle parking area (approximately 1,200 feet south of Taft Avenue). Class II on-street bicycle lanes of approximately 4–6 feet in width are provided on both sides of Cannon Street in this area as well. The bicycle lanes continue north to Serrano Avenue. For a portion of that distance, the bicycle lane on the west side of Cannon Street is limited to 4 feet, including the gutter. The narrowness of the bicycle lane likely discourages some users. A sidewalk is provided along the east side of Cannon Street between Serrano Avenue and Santiago Creek. On the west side of Cannon Street, however, a portion of sidewalk is missing between Serrano Avenue and Taft Avenue. Due to this, pedestrians must share the Santiago Creek Trail and Bikepath south of the Santiago Creek Trail and Bikepath bicycle parking area.

Figure 1 (all figures attached) illustrates the current lane configuration of the three intersections in the project area. A second northbound right-turn lane was recently added to the intersection of Cannon Street/Serrano Avenue to accommodate existing demand. While the intersection of Cannon Street/Serrano Avenue currently has dual northbound right-turn lanes, the existing turn pocket is 185 feet, providing queuing space for seven or eight vehicles. A queue exceeding seven or eight vehicles would first begin to obstruct the northbound bicycle lane, then the second northbound through lane.

LSA contracted with an independent data collection company to survey daily traffic volumes along Cannon Street. These data (collected on Tuesday, April 4, 2023) are included as an attachment. Table A summarizes the daily traffic volume in the study area. Table B summarizes the traffic volume during the peak commute hours.

**Table A: Cannon Street Daily Traffic Volume**

	LOS E Capacity	Existing Volume	Volume to Capacity	LOS
Between Serrano Avenue and Taft Avenue	37,500	33,096	0.88	D
Between Taft Avenue and Santiago Canyon Road	37,500	30,297	0.81	D

Source: Orange General Plan Circulation and Mobility Element; Counts Unlimited (2023)  
LOS = level of service

**Table B: Cannon Street Peak-Hour Traffic Volume**

	Northbound	Southbound	Total
<b>Between Serrano Avenue and Taft Avenue</b>			
A.M. Peak Hour (7:30-8:30 a.m.)	796	2,325	3,121
P.M. Peak Hour (5:00-6:00 p.m.)	2,511	1,019	3,530
<b>Between Taft Avenue and Santiago Canyon Road</b>			
A.M. Peak Hour (7:30-8:30 a.m.)	748	2,269	3,017
P.M. Peak Hour (5:00-6:00 p.m.)	2,265	937	3,202

Source: Counts Unlimited (2023)

The data collection company also collected peak-hour intersection turn volume at Cannon Street/Serrano Avenue, Cannon Street/Taft Avenue, and Cannon Street/Santiago Canyon Road. Figure 2 illustrates the morning and evening peak-hour traffic volumes. As Figure 2 shows, the intersection of Cannon Street/Serrano Avenue has a high volume of northbound right-turns during the p.m. peak hour (1,448 vehicles). It should be noted that the capacity of a single traffic lane at a signalized intersection is estimated at 1,700 vehicles per hour, which could only be achieved if the lane were free flowing (i.e., no red lights) for the entire hour. LSA used Traffix software to analyze the intersection capacity utilization (ICU) of each intersection and Synchro software to apply Highway Capacity Manual (HCM) methodology. The City uses ICU methodology as the standard to measure the performance of an intersection. HCM methodology was used to further describe the operation of the intersections, including anticipated queueing. Table C summarizes the results of the existing level of service analysis consistent with City methodology.

**Table C: Existing Level of Service Summary**

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
Cannon St/Serrano Ave	0.734	C	0.548	A
Cannon St/Taft Ave	0.877	D	0.943	E
Cannon St/Santiago Cyn Rd	0.729	C	0.746	C

Source: Compiled by LSA (2023).

ICU = Intersection Capacity Utilization

LOS = level of service

As Table C shows, recent installation of the second northbound right-turn lane at Cannon Street/Serrano Avenue preserves satisfactory level of service at this intersection with existing traffic volumes. Prior to installation of the second northbound right-turn lane, this intersection operated at LOS E in the p.m. peak hour, which was worse than the City’s LOS D standard. At the intersection of Cannon Street/Taft Avenue, existing traffic volume results in LOS E conditions in the p.m. peak hour.

The HCM methodology was applied to the intersections to consider the operational effects of traffic signal timing. The analysis applies optimized timing to actuated traffic signals. The HCM analysis identifies the queues anticipated for each movement based on volume and available green time. Table D provides the summary of the queueing analysis for the turning lanes.

As Table D shows, the existing traffic volume results in several queues exceeding the storage length of turn pockets. At the intersection of Cannon Street/Santiago Canyon Road, the northbound left-turn pocket is exceeded by two vehicles in the a.m. peak hour, the southbound left-turn pocket is exceeded by three vehicles in the a.m. peak hour, and the eastbound left-turn pocket is exceeded by six vehicles in the p.m. peak hour. At each of these locations, stacking likely extends into the painted median with little impact to the through traffic lanes. At the intersection of Cannon Street/Santiago Canyon Road, the southbound right-turn lane queue generated by 743 vehicles is more than double the storage length provided in the a.m. peak hour, according to the HCM calculations, which accounts for the overlap signal phase for this movement. This a.m. peak-hour queue likely blocks the exclusive southbound through lane.

**Table D: Existing Peak Hour Turning Lane Queues**

Intersection	Storage Length (feet)	Queue Length (feet)	
		AM Peak Hour	PM Peak Hour
<b>Cannon Street/Serrano Avenue</b>			
Northbound Right	185	5	125
Southbound Left	213	45	109
Westbound Left	325	286	151
<b>Cannon Street/Taft Avenue</b>			
Northbound Left	170	135	69
Southbound Left	75	0	0
<b>Cannon Street/Santiago Canyon Road</b>			
Northbound Left	80	145	82
Southbound Left	383	460	176
Southbound Right	263	584	116
Eastbound Left	316	129	451
Westbound Left	140	36	68

Source: Compiled by LSA (2023).

At the intersection of Cannon Street/Serrano Avenue the HCM calculations predict that a 125 feet queue would form in the p.m. peak hour even with dual northbound right-turn lanes if both lanes are evenly utilized. Prior to installation of the second northbound right-turn lane, the 1,448 vehicles in the p.m. peak hour would form a queue 1,272 feet in length. The queue extended south of the Cannon Street/Taft Avenue intersection. As a result, the entire second northbound through lane would be blocked by vehicles intending to turn right at Serrano Avenue. In these conditions, some drivers are enticed use the first northbound through lane as far as practicable and then nose into the turning queue. This behavior can result in both through lanes being blocked and impassible to non-turning vehicles including emergency vehicles. Installation of the second northbound right-turn lane reduced queueing at the intersection, but the high volume of vehicles making this movement still uses much of the northbound through capacity along the corridor.

## PROJECT DESCRIPTION

The proposed project would widen the roadway to accommodate a third northbound lane from approximately 500 feet north of Santiago Canyon Road to Serrano Avenue, where it will join the existing dedicated right-turn lanes to eastbound Serrano Avenue. As such, this additional lane will function as an auxiliary lane extending the northbound right-turn pocket to improve traffic operations. South of Santiago Creek, additional pavement will be constructed to the east to widen the roadway to meet standard horizontal curve radii. North of Santiago Creek, the roadway will be widened to the west by approximately 9 feet. In the southbound direction, bicyclists and pedestrians will cross Santiago Creek on a new bridge just west of the existing vehicular bridge. The new bridge will clear span the creek and is expected to consist of a prefabricated steel truss, approximately 170 feet long and 12 feet wide. The new bridge will carry two-way traffic for pedestrians and southbound traffic for bicyclists. Existing pavement delineation will be reconfigured and portions of the painted median will be replaced with a raised landscaped median. A traffic signal modification is required at Taft Avenue.

## VEHICLE MILES TRAVELED

On December 28, 2018, the California Office of Administrative Law cleared revised CEQA guidelines for use. Among the changes to the guidelines was the removal of vehicle delay and LOS from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT). Lead agencies were allowed to opt-in to the revised transportation guidelines, but the new guidelines must be used starting July 1, 2020.

The City of Orange *Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment* (July 2020) establishes thresholds for land development projects, but does not establish thresholds for transportation projects. However, the State provides sufficient guidance to evaluate transportation project impacts related to VMT.

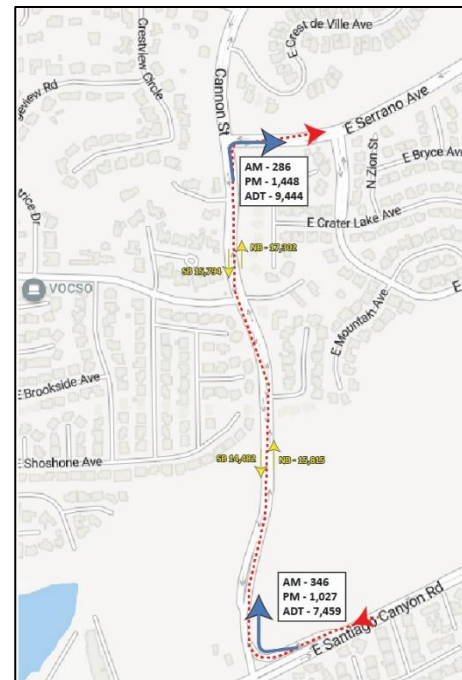
*The Technical Advisory on Evaluating Transportation Impacts in CEQA* (Governor's Office of Planning and Research, December 2018) states:

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include [27 examples of which are]:

- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit.

The proposed project would extend the existing northbound right-turn lanes at Cannon Street/Serrano Avenue (as an auxiliary lane) approximately 2,500 feet to 500 feet north of the intersection of Cannon Street/Santiago Canyon Road. This would result in one continuous lane from the westbound free-right turn at Cannon Street/Santiago Canyon Road to the northbound right-turn lanes at Cannon Street/Serrano Avenue. The continuous lane will operate as the northbound right-turn lane at Cannon Street/Serrano Avenue as over 85 percent of the capacity of this lane turns right at Serrano Avenue. In addition to the extension of this turn lane, the project would add a new, 12-foot-wide bridge over Santiago Creek to accommodate two-way traffic for pedestrians and southbound bicyclists. North of Santiago Creek, the roadway would be widened by 9 feet to improve pedestrian and bicycle facilities where the existing bicycle lane narrows to 4 feet (including the gutter). The project completes bicycle and pedestrian facilities where a gap currently exists south of Santiago Creek.

Exhibit 1 illustrates the existing vehicle traffic volume that would use the extended northbound right-turn lane. As Exhibit 1 shows (and was previously disclosed on Figure 2), the number of westbound right-turns from Santiago Canyon Road to Cannon Street and the northbound right-turns from Cannon Street to Serrano Avenue are large (more than 1,000 in the p.m. peak hour). Of the 1,448 p.m. peak-hour northbound right-turns from Cannon Street to Serrano Avenue, about 79 percent of them appear to originate from westbound Santiago Canyon Road. Most of the remainder are from eastbound left-turns from Taft Avenue. As stated previously, the existing 1,448 vehicles traveling north on Cannon Street to turn right at Serrano Avenue in the p.m. peak hour account for most of the 1,700 vehicle capacity of a travel lane. If the dual northbound right-turn lanes at Cannon Street/Serrano Avenue are not evenly utilized, the resulting queue could extend farther than indicated in Table D revealed. When a single northbound right-turn lane was present the queue (1,272 feet) would extend past Taft Avenue and would occupy approximately half of the 2,500-foot turn lane being provided. The new lane could not be used by northbound through traffic because the lane would be filled by 1,448 vehicles using it as a turn lane.



The project substantially conforms to the examples of an auxiliary lane less than 1 mile in length (2,500 feet) and installation of a traffic lane that is not for through traffic (extending the Cannon Street/Serrano Avenue northbound right-turn lane). While Cannon Street accommodates a greater volume of traffic than a typical local or collector street, it should be noted that the project also improves conditions for pedestrians and cyclists (widening of the west side of Cannon Street where pedestrian and bicycle facilities narrow and providing a new bridge over Santiago Creek). In addition, beyond the 0.6-mile project limits, Cannon Street would remain a four lane roadway and the northbound right-turn lane at Cannon Street/Serrano Avenue would remain a single lane despite the large traffic volume. As such, the proposed project would not likely lead to a substantial increase in vehicle travel, would not require an induced travel analysis, and would be presumed to have a less-than-significant transportation impact under the revised *State CEQA Guidelines*.

**CONCLUSION**

This memorandum describes the proposed widening of Cannon Street to extend the Cannon Street/Serrano Avenue northbound right-turn lanes and improve pedestrian/bicycle facilities on the west side of Cannon Street. While the daily traffic volume is within the standards for similarly classified roadways, the high peak-hour traffic volumes result in challenging operation of the intersections and queueing in turn lanes that exceed the striped storage length. Before the addition of a second northbound right-turn lane, the queue for northbound right-turn vehicles as Cannon Street/Serrano Avenue was 1,272 feet, while the existing storage length was 133 feet. If the recently added second northbound right-turn lane is not evenly utilized, the queue would continue to exceed the storage length. The proposed project would extend this turn lane. As a result of the project, the

high volume of vehicles traveling from westbound Santiago Canyon Road, through northbound Cannon Street, to eastbound Serrano Avenue would not be required to make any lane changes. The proposed project's potential impacts to VMT were considered according to guidance provided by the State. The project was found to substantially conform to two examples of projects that would not likely lead to a substantial or measurable increase in vehicle travel and therefore generally should not require an induced travel analysis. As a result, the project was found to have a less than significant transportation impact related to VMT.

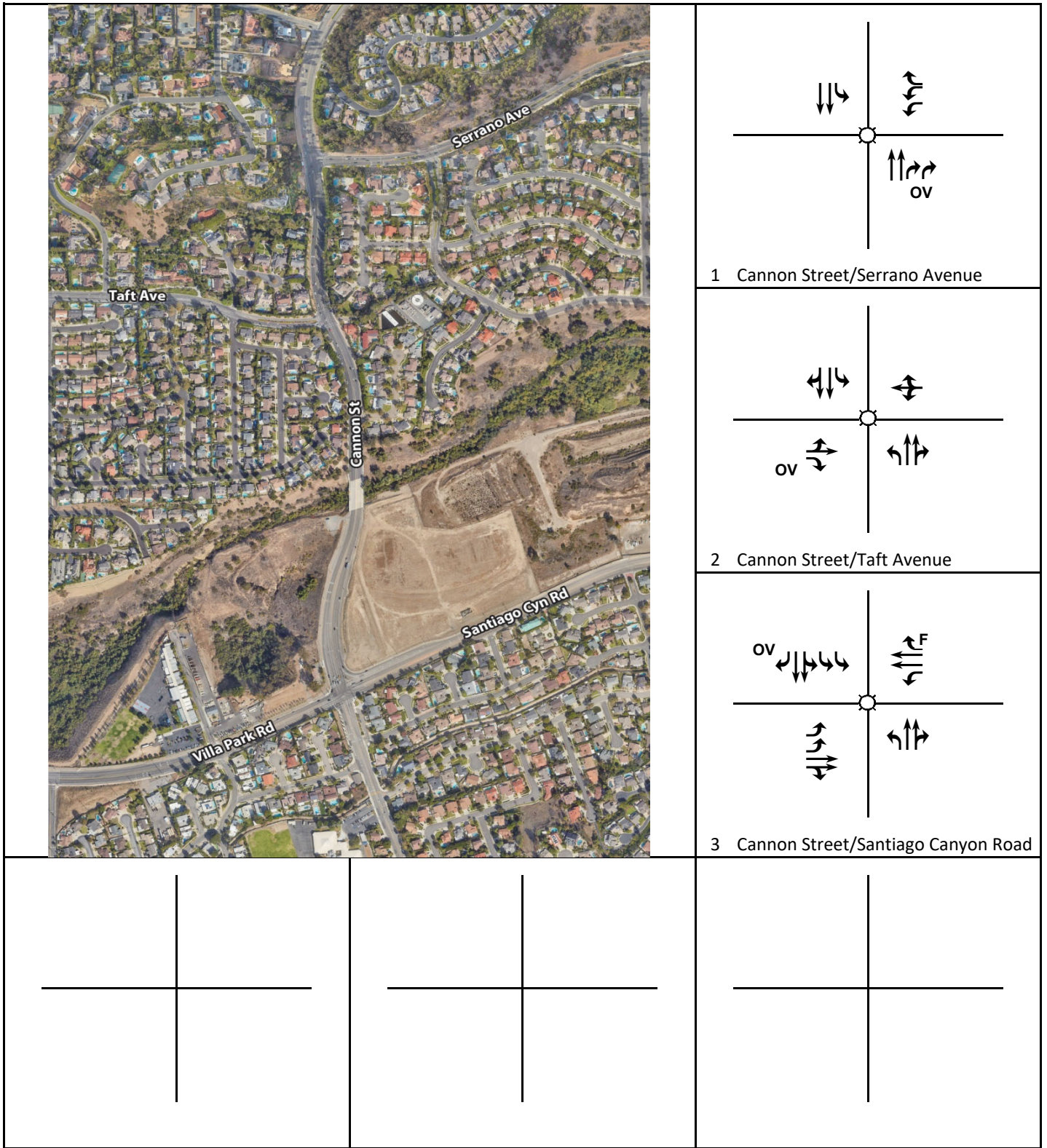
Attachments: A: Figure 1: Existing Geometry  
Figure 2: Existing Volumes  
B: Level of Service Worksheets

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## ATTACHMENT A

## FIGURES 1 AND 2





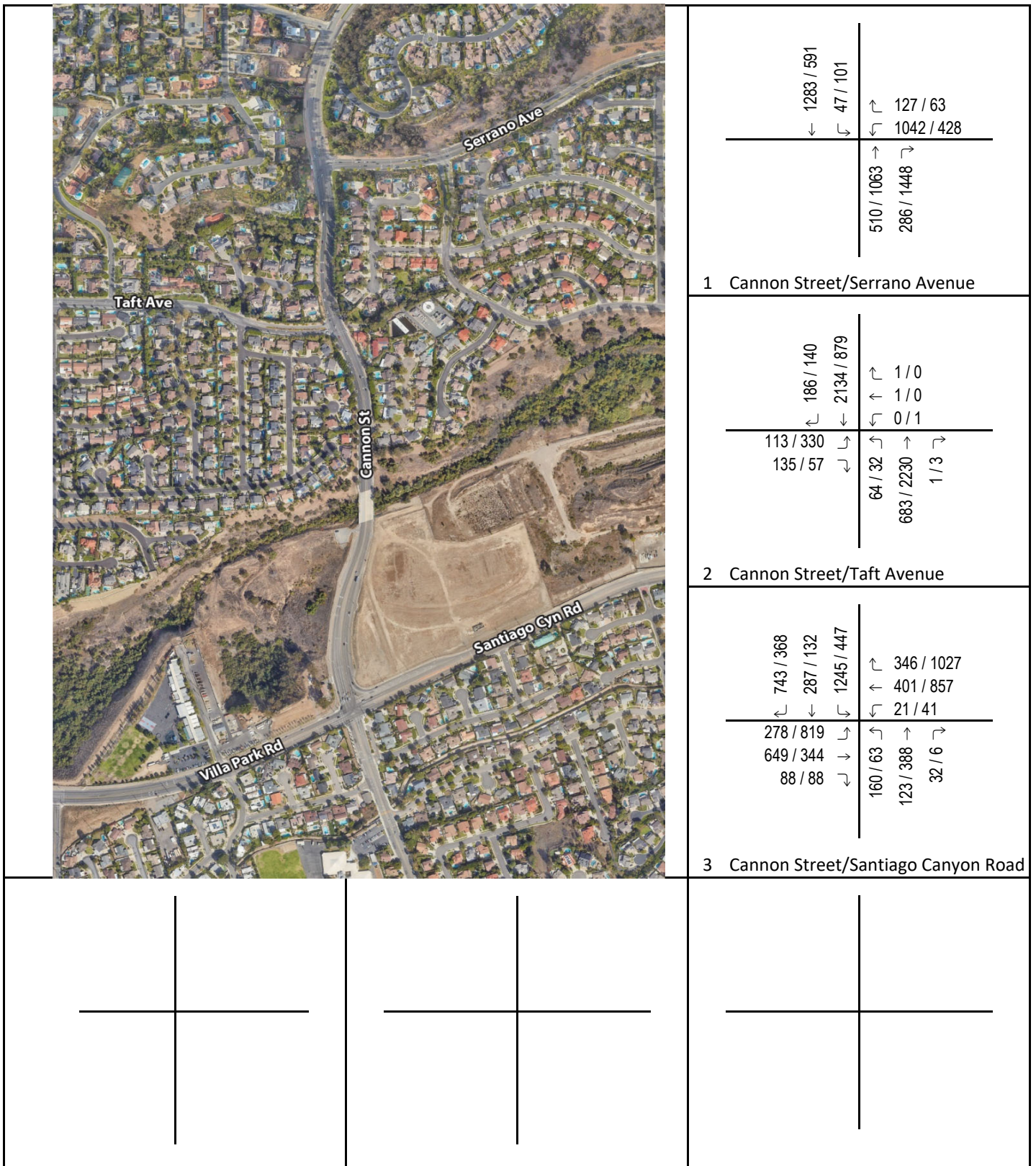
**LSA**

- LEGEND**
- Signal
  - Stop Sign
  - F Free Right Turn
  - OV Overlap Signal Phasing

*Cannon Street  
Existing Geometry*

FIGURE 1





LEGEND  
 XXX / YYY AM / PM Volume

FIGURE 2

Cannon Street  
 Existing Volume (2023)

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**ATTACHMENT B**

**LEVEL OF SERVICE WORKSHEETS**

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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Intersection #1 Cannon Street/Serrano Avenue

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Cycle (sec): 100 Critical Vol./Cap.(X): 0.734

Loss Time (sec): 5 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 41 Level Of Service: C

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Table with 4 columns: Approach (North Bound, South Bound, East Bound, West Bound) and 3 rows: Movement (L, T, R), Control, Rights, Min. Green, Y+R, Lanes.

Volume Module:

Table with 12 columns for different volume metrics and 12 rows for various adjustment factors like Base Vol, Growth Adj, etc.

Saturation Flow Module:

Table with 12 columns for saturation flow metrics and 4 rows for Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module:

Table with 12 columns for capacity analysis metrics and 2 rows for Vol/Sat, OvlAdjV/S.

Crit Moves: \*\*\*\*

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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Intersection #2 Cannon Street/Taft Avenue

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Cycle (sec): 100 Critical Vol./Cap.(X): 0.877
Loss Time (sec): 5 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 75 Level Of Service: D

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Table with 4 columns: North Bound, South Bound, East Bound, West Bound. Rows include Movement, Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module:

Table with 13 columns representing different volume and adjustment factors like Base Vol, Growth Adj, Initial Bse, etc.

Saturation Flow Module:

Table with 13 columns representing saturation flow factors like Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module:

Table with 13 columns representing capacity analysis factors like Vol/Sat, OvlAdjV/S, Crit Moves.

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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Intersection #3 Cannon Street/Santiago Cyn Rd

\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.729

Loss Time (sec): 5 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 40 Level Of Service: C

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Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Ovl			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	1	0	2	0	1	1	0	2

Volume Module:

Base Vol:	160	123	32	1245	287	743	278	649	88	21	401	346
Growth 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
Initial Bse:	160	123	32	1245	287	743	278	649	88	21	401	346
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	160	123	32	1245	287	743	278	649	88	21	401	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	160	123	32	1245	287	743	278	649	88	21	401	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	160	123	32	1245	287	743	278	649	88	21	401	0
OvlAdjVol:	604											

Saturation Flow Module:

Sat/Lane:	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.59	0.41	3.00	1.00	1.00	2.00	1.76	0.24	1.00	2.00	1.00
Final Sat.:	1700	2698	702	5100	1700	1700	3400	2994	406	1700	3400	1700

Capacity Analysis Module:

Vol/Sat:	0.09	0.05	0.05	0.24	0.17	0.44	0.08	0.22	0.22	0.01	0.12	0.00
OvlAdjV/S:	0.36											
Crit Moves:	****			****			****			****		

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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Intersection #1 Cannon Street/Serrano Avenue

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Cycle (sec): 100 Critical Vol./Cap.(X): 0.548

Loss Time (sec): 5 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 26 Level Of Service: A

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Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	2	0	2	0	0	0	0	2	0	0

Volume Module:

Base Vol:	0	1063	1448	101	591	0	0	0	0	428	0	63
Growth 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
Initial Bse:	0	1063	1448	101	591	0	0	0	0	428	0	63
User 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
PHF 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
PHF Volume:	0	1063	1448	101	591	0	0	0	0	428	0	63
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1063	1448	101	591	0	0	0	0	428	0	63
PCE 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
MLF 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
FinalVolume:	0	1063	1448	101	591	0	0	0	0	428	0	63
OvlAdjVol:	1020											

Saturation Flow Module:

Sat/Lane:	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	2.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	0	3400	3400	1700	3400	0	0	0	0	3400	0	1700

Capacity Analysis Module:

Vol/Sat:	0.00	0.31	0.43	0.06	0.17	0.00	0.00	0.00	0.00	0.13	0.00	0.04
OvlAdjV/S:	0.30											
Crit Moves:	****			****						****		

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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Intersection #2 Cannon Street/Taft Avenue

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Cycle (sec): 100 Critical Vol./Cap.(X): 0.943
Loss Time (sec): 5 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 122 Level Of Service: E

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Table with 4 columns: North Bound, South Bound, East Bound, West Bound. Rows include Movement, Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module:

Table with 13 columns representing different volume and adjustment factors like Base Vol, Growth Adj, Initial Bse, etc.

Saturation Flow Module:

Table with 13 columns for saturation flow factors like Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module:

Table with 13 columns for capacity analysis factors like Vol/Sat, OvlAdjV/S, Crit Moves.

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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Intersection #3 Cannon Street/Santiago Cyn Rd

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Cycle (sec): 100 Critical Vol./Cap.(X): 0.746

Loss Time (sec): 5 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 43 Level Of Service: C

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Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Ovl			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	1	0	2	0	1	1	0	2

Volume Module:

Base Vol:	63	388	6	447	132	368	819	344	88	41	857	1027
Growth 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
Initial Bse:	63	388	6	447	132	368	819	344	88	41	857	1027
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	63	388	6	447	132	368	819	344	88	41	857	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	63	388	6	447	132	368	819	344	88	41	857	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	63	388	6	447	132	368	819	344	88	41	857	0
OvlAdjVol:	0											

Saturation Flow Module:

Sat/Lane:	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.97	0.03	3.00	1.00	1.00	2.00	1.59	0.41	1.00	2.00	1.00
Final Sat.:	1700	3348	52	5100	1700	1700	3400	2707	693	1700	3400	1700

















Capacity Analysis Module:

Vol/Sat:	0.04	0.12	0.12	0.09	0.08	0.22	0.24	0.13	0.13	0.02	0.25	0.00
OvlAdjV/S:	0.00											
Crit Moves:	****			****			****			****		

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Lanes, Volumes, Timings  
1: N Cannon St & Serrano Ave

Existing AM.syn  
01/23/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 		 	 		 
Traffic Volume (vph)	1042	127	510	286	47	1283
Future Volume (vph)	1042	127	510	286	47	1283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325	325		135	215	
Storage Lanes	2	0		2	1	
Taper Length (ft)	50				75	
Lane Util. Factor	0.97	1.00	0.95	0.88	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3539	2787	1770	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	2787	1770	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		134		301		
Link Speed (mph)	30		45			45
Link Distance (ft)	1170		959			676
Travel Time (s)	26.6		14.5			10.2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1097	134	537	301	49	1351
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1097	134	537	301	49	1351
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	6	20	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	3		2	3	1	6
Permitted Phases		8		2		

Lanes, Volumes, Timings  
1: N Cannon St & Serrano Ave

Existing AM.syn  
01/23/2024

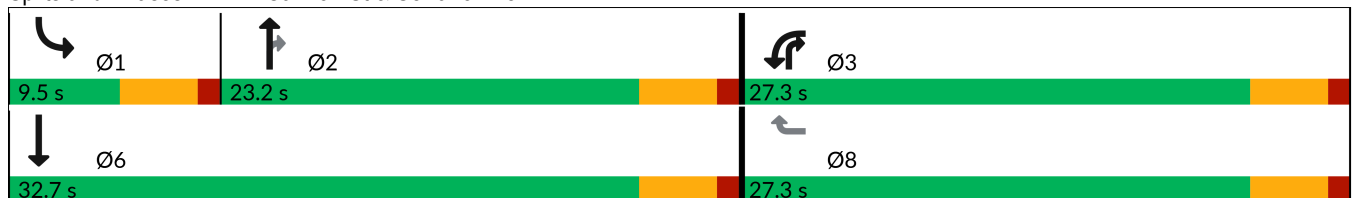


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3	8	2	3	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	9.5	22.5
Total Split (s)	27.3	27.3	23.2	27.3	9.5	32.7
Total Split (%)	45.5%	45.5%	38.7%	45.5%	15.8%	54.5%
Maximum Green (s)	22.8	22.8	18.7	22.8	5.0	28.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	None	None	Max
Walk Time (s)		7.0	7.0			7.0
Flash Dont Walk (s)		11.0	11.0			11.0
Pedestrian Calls (#/hr)		0	0			0
Act Effct Green (s)	21.9	21.9	22.6	50.9	5.0	28.2
Actuated g/C Ratio	0.37	0.37	0.38	0.86	0.08	0.48
v/c Ratio	0.86	0.20	0.40	0.12	0.33	0.80
Control Delay (s/veh)	26.1	3.7	15.9	0.4	32.3	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	26.1	3.7	15.9	0.4	32.3	18.1
LOS	C	A	B	A	C	B
Approach Delay (s/veh)	23.6		10.3			18.6
Approach LOS	C		B			B

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	59.2
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay (s/veh):	18.4
Intersection LOS:	B
Intersection Capacity Utilization:	72.7%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 1: N Cannon St & Serrano Ave



Queues  
1: N Cannon St & Serrano Ave

Existing AM.syn  
01/23/2024



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1097	134	537	301	49	1351
v/c Ratio	0.86	0.20	0.40	0.12	0.33	0.80
Control Delay (s/veh)	26.1	3.7	15.9	0.4	32.3	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	26.1	3.7	15.9	0.4	32.3	18.1
Queue Length 50th (ft)	179	0	81	0	17	206
Queue Length 95th (ft)	#286	28	122	5	45	287
Internal Link Dist (ft)	1090		879			596
Turn Bay Length (ft)	325	325		135	215	
Base Capacity (vph)	1324	692	1351	2436	149	1688
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.19	0.40	0.12	0.33	0.80

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: N Cannon St & Serrano Ave

Existing AM.syn  
 01/23/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1042	127	510	286	47	1283
Future Volume (veh/h)	1042	127	510	286	47	1283
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1097	134	537	301	49	1351
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1251	574	1277	2013	84	1719
Arrive On Green	0.36	0.36	0.36	0.36	0.05	0.48
Sat Flow, veh/h	3456	1585	3647	2790	1781	3647
Grp Volume(v), veh/h	1097	134	537	301	49	1351
Grp Sat Flow(s),veh/h/ln	1728	1585	1777	1395	1781	1777
Q Serve(g_s), s	17.3	3.4	6.6	2.0	1.6	18.5
Cycle Q Clear(g_c), s	17.3	3.4	6.6	2.0	1.6	18.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1251	574	1277	2013	84	1719
V/C Ratio(X)	0.88	0.23	0.42	0.15	0.59	0.79
Avail Cap(c_a), veh/h	1351	620	1277	2013	153	1719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	13.0	14.1	2.5	27.2	12.5
Incr Delay (d2), s/veh	6.5	0.2	1.0	0.2	6.4	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	1.1	2.3	0.3	0.7	6.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	23.8	13.2	15.1	2.7	33.6	16.3
LnGrp LOS	C	B	B	A	C	B
Approach Vol, veh/h	1231		838			1400
Approach Delay, s/veh	22.7		10.6			16.9
Approach LOS	C		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	7.2	25.5			32.7	25.6
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.0	18.7			28.2	22.8
Max Q Clear Time (g_c+I1), s	3.6	8.6			20.5	19.3
Green Ext Time (p_c), s	0.0	3.2			4.9	1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay, s/veh			17.4			
HCM 6th LOS			B			

Lanes, Volumes, Timings  
2: N Cannon St & Taft Ave

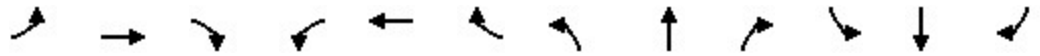
Existing AM.syn  
01/23/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Volume (vph)	113	0	135	0	1	1	64	683	1	0	2134	186
Future Volume (vph)	113	0	135	0	1	1	64	683	1	0	2134	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	170		0	70		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			85			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.932							0.988
Flt Protected		0.950					0.950					
Satd. Flow (prot)	0	1770	1583	0	1736	0	1770	3539	0	1863	3497	0
Flt Permitted		0.757					0.950					
Satd. Flow (perm)	0	1410	1583	0	1736	0	1770	3539	0	1863	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			14		1							17
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		925			407			2386			959	
Travel Time (s)		21.0			9.3			36.2			14.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	0	142	0	1	1	67	719	1	0	2246	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	119	142	0	2	0	67	720	0	0	2442	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov		NA		Prot	NA		Prot	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								

Lanes, Volumes, Timings  
2: N Cannon St & Taft Ave

Existing AM.syn  
01/23/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.8	22.8	10.4	22.8	22.8		10.4	87.7		9.5	86.8	
Total Split (%)	19.0%	19.0%	8.7%	19.0%	19.0%		8.7%	73.1%		7.9%	72.3%	
Maximum Green (s)	18.3	18.3	5.9	18.3	18.3		5.9	83.2		5.0	82.3	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		14.5	24.9		14.5		5.9	93.9			83.5	
Actuated g/C Ratio		0.12	0.21		0.12		0.05	0.80			0.71	
v/c Ratio		0.69	0.41		0.01		0.75	0.25			0.98	
Control Delay (s/veh)		69.0	39.1		37.0		100.9	3.4			31.1	
Queue Delay		0.0	0.0		0.0		0.0	0.0			7.1	
Total Delay (s/veh)		69.0	39.1		37.0		100.9	3.4			38.2	
LOS		E	D		D		F	A			D	
Approach Delay (s/veh)		52.8			37.0			11.7			38.2	
Approach LOS		D			D			B			D	

Intersection Summary

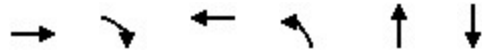
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	117.4
Natural Cycle:	120
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.98
Intersection Signal Delay (s/veh):	33.3
Intersection LOS:	C
Intersection Capacity Utilization:	88.7%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 2: N Cannon St & Taft Ave



Queues  
2: N Cannon St & Taft Ave

Existing AM.syn  
01/23/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	119	142	2	67	720	2442
v/c Ratio	0.69	0.41	0.01	0.75	0.25	0.98
Control Delay (s/veh)	69.0	39.1	37.0	100.9	3.4	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	7.1
Total Delay (s/veh)	69.0	39.1	37.0	100.9	3.4	38.2
Queue Length 50th (ft)	86	83	1	51	60	838
Queue Length 95th (ft)	150	144	9	#135	89	#1184
Internal Link Dist (ft)	845		327		2306	879
Turn Bay Length (ft)				170		
Base Capacity (vph)	219	346	271	89	2831	2493
Starvation Cap Reductn	0	0	0	0	0	81
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.41	0.01	0.75	0.25	1.01

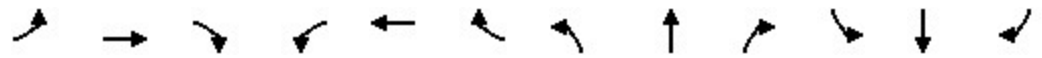
Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.



HCM 6th Signalized Intersection Summary  
 2: N Cannon St & Taft Ave

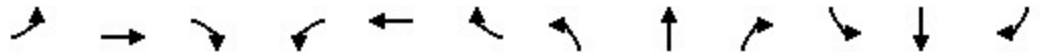
Existing AM.syn  
 01/23/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Volume (veh/h)	113	0	135	0	1	1	64	683	1	0	2134	186
Future Volume (veh/h)	113	0	135	0	1	1	64	683	1	0	2134	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	0	142	0	1	1	67	719	1	0	2246	196
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	0	245	0	91	91	86	2966	4	2	2406	207
Arrive On Green	0.11	0.00	0.11	0.00	0.11	0.11	0.05	0.81	0.81	0.00	0.73	0.73
Sat Flow, veh/h	1401	0	1585	0	858	858	1781	3641	5	1781	3311	285
Grp Volume(v), veh/h	119	0	142	0	0	2	67	351	369	0	1190	1252
Grp Sat Flow(s),veh/h/ln	1401	0	1585	0	0	1716	1781	1777	1869	1781	1777	1819
Q Serve(g_s), s	9.3	0.0	9.4	0.0	0.0	0.1	4.2	5.2	5.2	0.0	62.8	68.4
Cycle Q Clear(g_c), s	9.4	0.0	9.4	0.0	0.0	0.1	4.2	5.2	5.2	0.0	62.8	68.4
Prop In Lane	1.00		1.00	0.00		0.50	1.00		0.00	1.00		0.16
Lane Grp Cap(c), veh/h	212	0	245	0	0	182	86	1447	1523	2	1291	1322
V/C Ratio(X)	0.56	0.00	0.58	0.00	0.00	0.01	0.78	0.24	0.24	0.00	0.92	0.95
Avail Cap(c_a), veh/h	291	0	332	0	0	277	93	1447	1523	79	1291	1322
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
Upstream Filter(l)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	0.0	44.5	0.0	0.0	45.3	53.3	2.4	2.4	0.0	12.8	13.6
Incr Delay (d2), s/veh	2.3	0.0	2.2	0.0	0.0	0.0	31.8	0.4	0.4	0.0	12.2	15.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	3.8	0.0	0.0	0.1	2.6	1.2	1.2	0.0	22.5	25.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.8	0.0	46.7	0.0	0.0	45.3	85.1	2.8	2.8	0.0	25.0	28.6
LnGrp LOS	D		D			D	F	A	A		C	C
Approach Vol, veh/h		261			2			787			2442	
Approach Delay, s/veh		49.0			45.3			9.8			26.9	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	96.8		16.5	10.0	86.8		16.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	83.2		18.3	5.9	82.3		18.3				
Max Q Clear Time (g_c+I1), s	0.0	7.2		11.4	6.2	70.4		2.1				
Green Ext Time (p_c), s	0.0	4.5		0.6	0.0	10.8		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			24.7									
HCM 6th LOS			C									

Lanes, Volumes, Timings  
 3: N Cannon St & E Santiago Canyon Rd

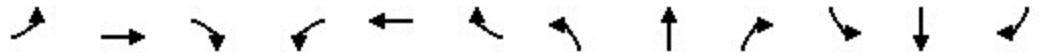
Existing AM.syn  
 01/23/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	649	88	21	401	346	160	123	32	1245	287	743
Future Volume (vph)	278	649	88	21	401	346	160	123	32	1245	287	743
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	315		0	140		400	80		0	385		0
Storage Lanes	2		0	1		1	1		0	2		1
Taper Length (ft)	85			85			60			125		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	0.86	0.86	1.00
Frt		0.982				0.850		0.969				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.971	
Satd. Flow (prot)	3433	3476	0	1770	3539	1583	1770	3430	0	3044	3111	1583
Flt Permitted	0.950			0.950			0.950			0.950	0.971	
Satd. Flow (perm)	3433	3476	0	1770	3539	1583	1770	3430	0	3044	3111	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				364		33				235
Link Speed (mph)		50			50			40				45
Link Distance (ft)		1746			1394			1328				2386
Travel Time (s)		23.8			19.0			22.6				36.2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	293	683	93	22	422	364	168	129	34	1311	302	782
Shared Lane Traffic (%)										33%		
Lane Group Flow (vph)	293	776	0	22	422	364	168	163	0	878	735	782
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA		Prot	NA	Free	Split	NA		Split	NA	pm+ov
Protected Phases	7	4		3	8		2	2		6	6	7
Permitted Phases						Free						6

Lanes, Volumes, Timings  
3: N Cannon St & E Santiago Canyon Rd

Existing AM.syn  
01/23/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	9.5
Total Split (s)	15.4	28.3		9.6	22.5		23.7	23.7		28.4	28.4	15.4
Total Split (%)	17.1%	31.4%		10.7%	25.0%		26.3%	26.3%		31.6%	31.6%	17.1%
Maximum Green (s)	10.9	23.8		5.1	18.0		19.2	19.2		23.9	23.9	10.9
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Max	Max		Max	Max	None
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	10.9	26.9		5.1	15.2	87.3	19.2	19.2		23.9	23.9	39.3
Actuated g/C Ratio	0.12	0.31		0.06	0.17	1.00	0.22	0.22		0.27	0.27	0.45
v/c Ratio	0.68	0.72		0.21	0.69	0.23	0.43	0.21		1.05	0.98dl	0.93
Control Delay (s/veh)	46.1	31.8		45.4	39.9	0.3	34.1	23.4		78.9	42.7	35.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	46.1	31.8		45.4	39.9	0.3	34.1	23.4		78.9	42.7	35.7
LOS	D	C		D	D	A	C	C		E	D	D
Approach Delay (s/veh)		35.7			22.2			28.8			53.7	
Approach LOS		D			C			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 87.3  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay (s/veh): 42.2      Intersection LOS: D  
 Intersection Capacity Utilization 77.2%      ICU Level of Service D  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: N Cannon St & E Santiago Canyon Rd



Queues  
3: N Cannon St & E Santiago Canyon Rd

Existing AM.syn  
01/23/2024



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	293	776	22	422	364	168	163	878	735	782
v/c Ratio	0.68	0.72	0.21	0.69	0.23	0.43	0.21	1.05	0.98dl	0.93
Control Delay (s/veh)	46.1	31.8	45.4	39.9	0.3	34.1	23.4	78.9	42.7	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.1	31.8	45.4	39.9	0.3	34.1	23.4	78.9	42.7	35.7
Queue Length 50th (ft)	80	180	12	115	0	80	30	~311	223	298
Queue Length 95th (ft)	#129	#306	36	164	0	145	59	#460	#348	#584
Internal Link Dist (ft)		1666		1314			1248		2306	
Turn Bay Length (ft)	315		140		400	80		385		
Base Capacity (vph)	428	1082	103	730	1583	389	780	834	852	842
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.72	0.21	0.58	0.23	0.43	0.21	1.05	0.86	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

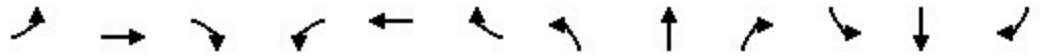
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM 6th Signalized Intersection Summary  
 3: N Cannon St & E Santiago Canyon Rd

Existing AM.syn  
 01/23/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↕↔		↔↔	↕↕	↔
Traffic Volume (veh/h)	278	649	88	21	401	346	160	123	32	1245	287	743
Future Volume (veh/h)	278	649	88	21	401	346	160	123	32	1245	287	743
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	683	93	22	422	0	168	129	34	1311	302	782
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	791	108	43	594		405	638	163	1514	530	621
Arrive On Green	0.11	0.25	0.25	0.02	0.17	0.00	0.23	0.23	0.23	0.28	0.28	0.28
Sat Flow, veh/h	3456	3143	428	1781	3554	1585	1781	2802	716	5344	1870	1585
Grp Volume(v), veh/h	293	386	390	22	422	0	168	80	83	1311	302	782
Grp Sat Flow(s),veh/h/ln	1728	1777	1793	1781	1777	1585	1781	1777	1741	1781	1870	1585
Q Serve(g_s), s	7.0	17.5	17.5	1.0	9.5	0.0	6.8	3.1	3.2	19.6	11.6	23.9
Cycle Q Clear(g_c), s	7.0	17.5	17.5	1.0	9.5	0.0	6.8	3.1	3.2	19.6	11.6	23.9
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	375	447	451	43	594		405	404	396	1514	530	621
V/C Ratio(X)	0.78	0.86	0.86	0.52	0.71		0.41	0.20	0.21	0.87	0.57	1.26
Avail Cap(c_a), veh/h	447	501	506	108	758		405	404	396	1514	530	621
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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	30.2	30.2	40.7	33.2	0.0	27.8	26.3	26.4	28.7	25.8	25.6
Incr Delay (d2), s/veh	7.4	13.3	13.4	9.4	2.2	0.0	3.1	1.1	1.2	6.9	4.4	129.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	8.4	8.5	0.5	3.9	0.0	3.1	1.4	1.4	8.6	5.4	33.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.0	43.5	43.5	50.1	35.4	0.0	30.9	27.4	27.6	35.6	30.2	154.9
LnGrp LOS	D	D	D	D	D		C	C	C	D	C	F
Approach Vol, veh/h		1069			444			331			2395	
Approach Delay, s/veh		43.6			36.2			29.2			73.9	
Approach LOS		D			D			C			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.7	6.5	25.7		28.4	13.7	18.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.2	5.1	23.8		23.9	10.9	18.0				
Max Q Clear Time (g_c+I1), s		8.8	3.0	19.5		25.9	9.0	11.5				
Green Ext Time (p_c), s		0.9	0.0	1.7		0.0	0.2	1.3				

Intersection Summary













HCM 6th Ctrl Delay, s/veh	58.8
HCM 6th LOS	E

Notes

- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings  
1: N Cannon St & Serrano Ave

Existing PM.syn  
01/23/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	428	63	1063	1448	101	591
Future Volume (vph)	428	63	1063	1448	101	591
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325	325		135	215	
Storage Lanes	2	0		2	1	
Taper Length (ft)	50				75	
Lane Util. Factor	0.97	1.00	0.95	0.88	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3539	2787	1770	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	2787	1770	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		66		637		
Link Speed (mph)	30		45			45
Link Distance (ft)	1170		959			676
Travel Time (s)	26.6		14.5			10.2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	451	66	1119	1524	106	622
Shared Lane Traffic (%)						
Lane Group Flow (vph)	451	66	1119	1524	106	622
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	6	20	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	3		2	3	1	6
Permitted Phases		8		2		

Lanes, Volumes, Timings  
1: N Cannon St & Serrano Ave

Existing PM.syn  
01/23/2024

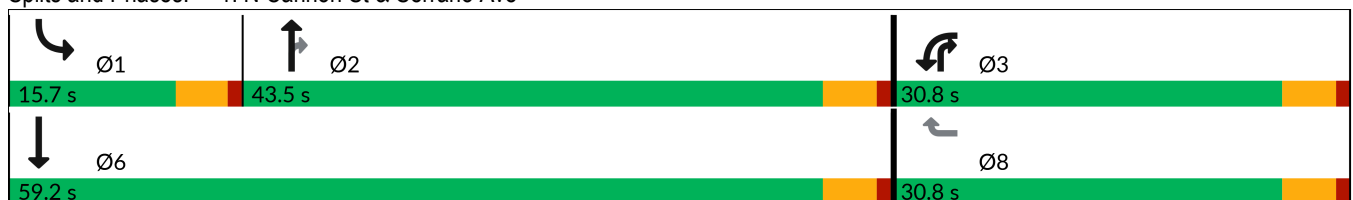


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3	8	2	3	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	9.5	22.5
Total Split (s)	30.8	30.8	43.5	30.8	15.7	59.2
Total Split (%)	34.2%	34.2%	48.3%	34.2%	17.4%	65.8%
Maximum Green (s)	26.3	26.3	39.0	26.3	11.2	54.7
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	None	None	Max
Walk Time (s)		7.0	7.0			7.0
Flash Dont Walk (s)		11.0	11.0			11.0
Pedestrian Calls (#/hr)		0	0			0
Act Effct Green (s)	22.1	22.1	43.2	70.7	9.5	54.8
Actuated g/C Ratio	0.26	0.26	0.50	0.82	0.11	0.64
v/c Ratio	0.51	0.15	0.63	0.63	0.54	0.28
Control Delay (s/veh)	29.3	7.3	19.7	3.4	47.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	29.3	7.3	19.7	3.4	47.4	7.7
LOS	C	A	B	A	D	A
Approach Delay (s/veh)	26.5		10.3			13.5
Approach LOS	C		B			B

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	85.9
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.63
Intersection Signal Delay (s/veh):	13.0
Intersection LOS:	B
Intersection Capacity Utilization:	63.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 1: N Cannon St & Serrano Ave



Queues  
1: N Cannon St & Serrano Ave

Existing PM.syn  
01/23/2024



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	451	66	1119	1524	106	622
v/c Ratio	0.51	0.15	0.63	0.63	0.54	0.28
Control Delay (s/veh)	29.3	7.3	19.7	3.4	47.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	29.3	7.3	19.7	3.4	47.4	7.7
Queue Length 50th (ft)	107	0	248	71	55	73
Queue Length 95th (ft)	151	29	346	125	109	109
Internal Link Dist (ft)	1090		879			596
Turn Bay Length (ft)	325	325		135	215	
Base Capacity (vph)	1053	531	1778	2454	231	2258
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.12	0.63	0.62	0.46	0.28

Intersection Summary



HCM 6th Signalized Intersection Summary  
 1: N Cannon St & Serrano Ave

Existing PM.syn  
 01/23/2024

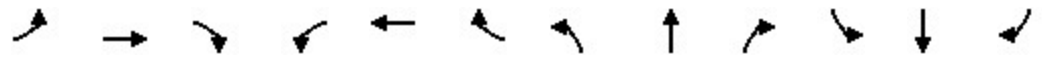


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶↶	↶	↕↕	↶↶	↶	↕↕
Traffic Volume (veh/h)	428	63	1063	1448	101	591
Future Volume (veh/h)	428	63	1063	1448	101	591
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	451	66	1119	1524	106	622
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	594	272	2047	2086	136	2527
Arrive On Green	0.17	0.17	0.58	0.58	0.08	0.71
Sat Flow, veh/h	3456	1585	3647	2790	1781	3647
Grp Volume(v), veh/h	451	66	1119	1524	106	622
Grp Sat Flow(s),veh/h/ln	1728	1585	1777	1395	1781	1777
Q Serve(g_s), s	9.6	2.8	15.0	23.4	4.5	4.7
Cycle Q Clear(g_c), s	9.6	2.8	15.0	23.4	4.5	4.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	594	272	2047	2086	136	2527
V/C Ratio(X)	0.76	0.24	0.55	0.73	0.78	0.25
Avail Cap(c_a), veh/h	1182	542	2047	2086	259	2527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	27.5	10.1	5.4	34.9	3.9
Incr Delay (d2), s/veh	2.0	0.5	1.1	2.3	9.1	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	1.1	4.8	4.9	2.2	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	32.4	28.0	11.1	7.7	44.0	4.1
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	517		2643			728
Approach Delay, s/veh	31.8		9.2			9.9
Approach LOS	C		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.4	48.8			59.2	17.7
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	11.2	39.0			54.7	26.3
Max Q Clear Time (g_c+I1), s	6.5	25.4			6.7	11.6
Green Ext Time (p_c), s	0.1	10.9			4.3	1.7

Intersection Summary						
HCM 6th Ctrl Delay, s/veh			12.3			
HCM 6th LOS			B			

Lanes, Volumes, Timings  
2: N Cannon St & Taft Ave

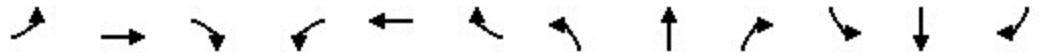
Existing PM.syn  
01/23/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Volume (vph)	330	0	57	1	0	0	32	2230	3	0	879	140
Future Volume (vph)	330	0	57	1	0	0	32	2230	3	0	879	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	170		0	70		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			85			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.979	
Flt Protected		0.950			0.950		0.950					
Satd. Flow (prot)	0	1770	1583	0	1770	0	1770	3539	0	1863	3465	0
Flt Permitted		0.757			0.197		0.950					
Satd. Flow (perm)	0	1410	1583	0	367	0	1770	3539	0	1863	3465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60									24
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		925			407			2386			959	
Travel Time (s)		21.0			9.3			36.2			14.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	347	0	60	1	0	0	34	2347	3	0	925	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	347	60	0	1	0	34	2350	0	0	1072	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8								

Lanes, Volumes, Timings  
2: N Cannon St & Taft Ave

Existing PM.syn  
01/23/2024

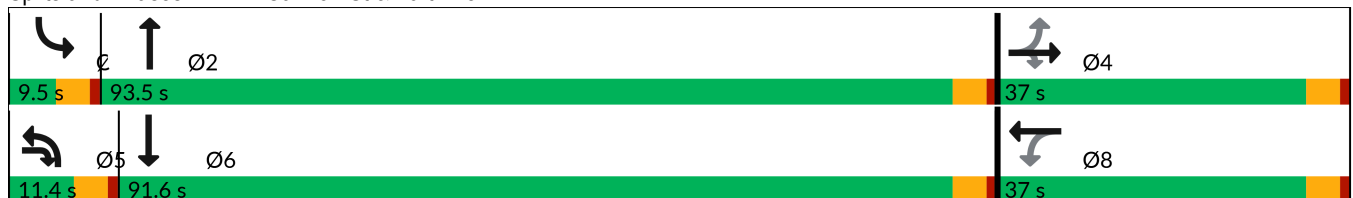


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	37.0	37.0	11.4	37.0	37.0		11.4	93.5		9.5	91.6	
Total Split (%)	26.4%	26.4%	8.1%	26.4%	26.4%		8.1%	66.8%		6.8%	65.4%	
Maximum Green (s)	32.5	32.5	6.9	32.5	32.5		6.9	89.0		5.0	87.1	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		32.5	43.6		32.5		6.6	96.6			87.6	
Actuated g/C Ratio		0.24	0.32		0.24		0.05	0.70			0.63	
v/c Ratio		1.05	0.11		0.01		0.40	0.95			0.49	
Control Delay (s/veh)		112.6	8.5		42.0		79.0	28.7			14.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay (s/veh)		112.6	8.5		42.0		79.0	28.7			14.3	
LOS		F	A		D		E	C			B	
Approach Delay (s/veh)		97.2			42.0			29.5			14.3	
Approach LOS		F			D			C			B	

Intersection Summary

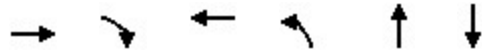
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	138.1
Natural Cycle:	140
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.05
Intersection Signal Delay (s/veh):	32.4
Intersection LOS:	C
Intersection Capacity Utilization:	86.4%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 2: N Cannon St & Taft Ave



Queues  
2: N Cannon St & Taft Ave

Existing PM.syn  
01/23/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	347	60	1	34	2350	1072
v/c Ratio	1.05	0.11	0.01	0.40	0.95	0.49
Control Delay (s/veh)	112.6	8.5	42.0	79.0	28.7	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	112.6	8.5	42.0	79.0	28.7	14.3
Queue Length 50th (ft)	~346	0	1	31	908	259
Queue Length 95th (ft)	#545	34	6	69	1075	312
Internal Link Dist (ft)	845		327		2306	879
Turn Bay Length (ft)				170		
Base Capacity (vph)	332	544	86	88	2474	2206
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.11	0.01	0.39	0.95	0.49

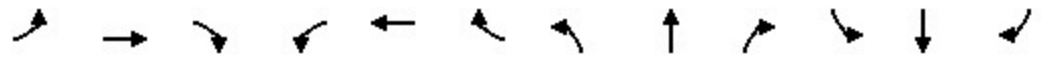
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 2: N Cannon St & Taft Ave

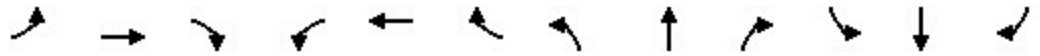
Existing PM.syn  
 01/23/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Volume (veh/h)	330	0	57	1	0	0	32	2230	3	0	879	140
Future Volume (veh/h)	330	0	57	1	0	0	32	2230	3	0	879	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	347	0	60	1	0	0	34	2347	3	0	925	147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	426	0	381	85	0	0	48	2617	3	1	2020	321
Arrive On Green	0.21	0.00	0.21	0.21	0.00	0.00	0.03	0.72	0.72	0.00	0.66	0.66
Sat Flow, veh/h	1743	0	1585	145	0	0	1781	3642	5	1781	3071	488
Grp Volume(v), veh/h	347	0	60	1	0	0	34	1145	1205	0	535	537
Grp Sat Flow(s),veh/h/ln	1743	0	1585	145	0	0	1781	1777	1870	1781	1777	1783
Q Serve(g_s), s	0.0	0.0	4.0	0.1	0.0	0.0	2.5	67.5	67.6	0.0	19.5	19.5
Cycle Q Clear(g_c), s	25.2	0.0	4.0	25.3	0.0	0.0	2.5	67.5	67.6	0.0	19.5	19.5
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.27
Lane Grp Cap(c), veh/h	426	0	381	85	0	0	48	1277	1344	1	1169	1172
V/C Ratio(X)	0.81	0.00	0.16	0.01	0.00	0.00	0.71	0.90	0.90	0.00	0.46	0.46
Avail Cap(c_a), veh/h	472	0	432	128	0	0	93	1277	1344	67	1169	1172
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	50.9	0.0	39.7	63.2	0.0	0.0	63.9	14.7	14.7	0.0	11.1	11.1
Incr Delay (d2), s/veh	9.7	0.0	0.2	0.1	0.0	0.0	17.4	10.0	9.7	0.0	1.3	1.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	0.0	1.6	0.0	0.0	0.0	1.3	25.4	26.6	0.0	7.3	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	60.6	0.0	39.9	63.2	0.0	0.0	81.3	24.8	24.4	0.0	12.4	12.4
LnGrp LOS	E		D	E			F	C	C		B	B
Approach Vol, veh/h		407			1			2384			1072	
Approach Delay, s/veh		57.5			63.2			25.4			12.4	
Approach LOS		E			E			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	99.7		32.8	8.1	91.6		32.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	89.0		32.5	6.9	87.1		32.5				
Max Q Clear Time (g_c+I1), s	0.0	69.6		27.2	4.5	21.5		27.3				
Green Ext Time (p_c), s	0.0	16.4		1.1	0.0	8.0		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			25.2									
HCM 6th LOS			C									

Lanes, Volumes, Timings  
 3: N Cannon St & E Santiago Canyon Rd

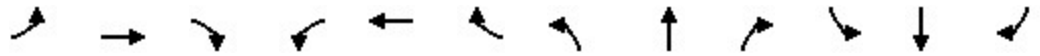
Existing PM.syn  
 01/23/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	819	344	88	41	857	1027	63	388	6	447	132	368
Future Volume (vph)	819	344	88	41	857	1027	63	388	6	447	132	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	315		0	140		400	80		0	385		0
Storage Lanes	2		0	1		1	1		0	2		1
Taper Length (ft)	85			85			60			125		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	0.86	0.86	1.00
Frt		0.969				0.850		0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.974	
Satd. Flow (prot)	3433	3430	0	1770	3539	1583	1770	3532	0	3044	3121	1583
Flt Permitted	0.950			0.950			0.950			0.950	0.974	
Satd. Flow (perm)	3433	3430	0	1770	3539	1583	1770	3532	0	3044	3121	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				581		1				276
Link Speed (mph)		50			50			40				45
Link Distance (ft)		1746			1394			1328			2386	
Travel Time (s)		23.8			19.0			22.6			36.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	862	362	93	43	902	1081	66	408	6	471	139	387
Shared Lane Traffic (%)										33%		
Lane Group Flow (vph)	862	455	0	43	902	1081	66	414	0	316	294	387
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Free	Split	NA		Split	NA	pm+ov
Protected Phases	7	4		3	8		2	2		6	6	7
Permitted Phases						Free						6

Lanes, Volumes, Timings  
 3: N Cannon St & E Santiago Canyon Rd

Existing PM.syn  
 01/23/2024

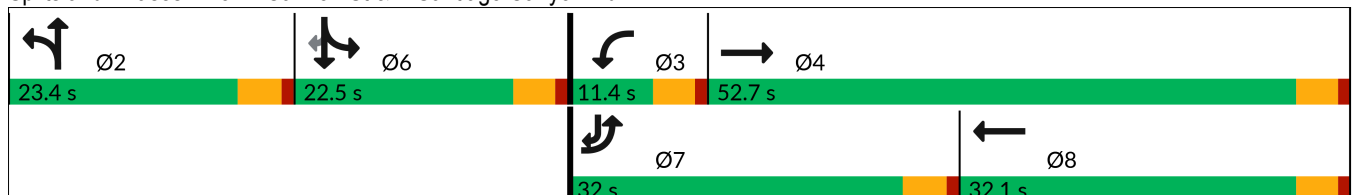


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		22.5	22.5		22.5	22.5	9.5
Total Split (s)	32.0	52.7		11.4	32.1		23.4	23.4		22.5	22.5	32.0
Total Split (%)	29.1%	47.9%		10.4%	29.2%		21.3%	21.3%		20.5%	20.5%	29.1%
Maximum Green (s)	27.5	48.2		6.9	27.6		18.9	18.9		18.0	18.0	27.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Max	Max		Max	Max	None
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	27.5	52.8		6.6	27.6	110.0	18.9	18.9		18.0	18.0	50.0
Actuated g/C Ratio	0.25	0.48		0.06	0.25	1.00	0.17	0.17		0.16	0.16	0.45
v/c Ratio	1.00	0.27		0.41	1.02	0.68	0.22	0.68		0.63	0.58	0.44
Control Delay (s/veh)	73.6	17.0		61.3	75.8	2.4	41.4	49.1		49.4	47.6	7.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	73.6	17.0		61.3	75.8	2.4	41.4	49.1		49.4	47.6	7.5
LOS	E	B		E	E	A	D	D		D	D	A
Approach Delay (s/veh)		54.0			36.3			48.0			32.6	
Approach LOS		D			D			D			C	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Natural Cycle:	110
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.02
Intersection Signal Delay (s/veh):	41.6
Intersection LOS:	D
Intersection Capacity Utilization:	81.5%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 3: N Cannon St & E Santiago Canyon Rd



Queues  
3: N Cannon St & E Santiago Canyon Rd

Existing PM.syn  
01/23/2024



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	862	455	43	902	1081	66	414	316	294	387
v/c Ratio	1.00	0.27	0.41	1.02	0.68	0.22	0.68	0.63	0.58	0.44
Control Delay (s/veh)	73.6	17.0	61.3	75.8	2.4	41.4	49.1	49.4	47.6	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	73.6	17.0	61.3	75.8	2.4	41.4	49.1	49.4	47.6	7.5
Queue Length 50th (ft)	~317	97	30	~345	0	41	145	122	112	45
Queue Length 95th (ft)	#451	135	68	#483	0	82	200	176	163	116
Internal Link Dist (ft)		1666		1314			1248		2306	
Turn Bay Length (ft)	315		140		400	80		385		
Base Capacity (vph)	858	1664	111	887	1583	304	607	498	510	870
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.27	0.39	1.02	0.68	0.22	0.68	0.63	0.58	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

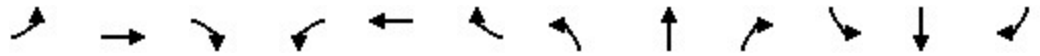
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



HCM 6th Signalized Intersection Summary  
 3: N Cannon St & E Santiago Canyon Rd

Existing PM.syn  
 01/23/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↕		↖	↕	↗	↖	↕		↗↘	↕	↗
Traffic Volume (veh/h)	819	344	88	41	857	1027	63	388	6	447	132	368
Future Volume (veh/h)	819	344	88	41	857	1027	63	388	6	447	132	368
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	862	362	93	43	902	0	66	408	6	471	139	387
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	864	1313	333	59	892		306	616	9	874	306	656
Arrive On Green	0.25	0.47	0.47	0.03	0.25	0.00	0.17	0.17	0.17	0.16	0.16	0.16
Sat Flow, veh/h	3456	2807	712	1781	3554	1585	1781	3585	53	5344	1870	1585
Grp Volume(v), veh/h	862	228	227	43	902	0	66	202	212	471	139	387
Grp Sat Flow(s),veh/h/ln	1728	1777	1742	1781	1777	1585	1781	1777	1861	1781	1870	1585
Q Serve(g_s), s	27.4	8.6	8.8	2.6	27.6	0.0	3.5	11.7	11.7	8.9	7.4	18.0
Cycle Q Clear(g_c), s	27.4	8.6	8.8	2.6	27.6	0.0	3.5	11.7	11.7	8.9	7.4	18.0
Prop In Lane	1.00		0.41	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	864	831	815	59	892		306	305	320	874	306	656
V/C Ratio(X)	1.00	0.27	0.28	0.73	1.01		0.22	0.66	0.66	0.54	0.45	0.59
Avail Cap(c_a), veh/h	864	831	815	112	892		306	305	320	874	306	656
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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.2	17.9	17.9	52.7	41.2	0.0	39.2	42.6	42.6	42.2	41.6	25.0
Incr Delay (d2), s/veh	30.0	0.2	0.2	15.5	33.0	0.0	1.6	10.8	10.4	2.4	4.8	3.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	3.3	3.3	1.4	15.5	0.0	1.6	5.9	6.2	4.0	3.7	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.3	18.1	18.1	68.2	74.2	0.0	40.8	53.3	52.9	44.6	46.4	28.9
LnGrp LOS	E	B	B	E	F		D	D	D	D	D	C
Approach Vol, veh/h		1317			945			480				997
Approach Delay, s/veh		52.9			74.0			51.4				38.7
Approach LOS		D			E			D				D
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.4	8.2	55.9		22.5	32.0	32.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		18.9	6.9	48.2		18.0	27.5	27.6				
Max Q Clear Time (g_c+I1), s		13.7	4.6	10.8		20.0	29.4	29.6				
Green Ext Time (p_c), s		1.1	0.0	2.5		0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay, s/veh	54.3
HCM 6th LOS	D

Notes

- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.