24601 HAWTHORNE BLVD. MIXED-USE DEVELOPMENT TRAFFIC IMPACT STUDY UPDATE TORRANCE - CALIFORNIA

Prepared for:

Ashai Design Consulting Corporation
15900 Hawthorne Boulevard
Lawndale, California 90260

Revised on:

April 12, 2021

COCO TRAFFIC PLANNERS, INC.

24601 HAWTHORNE BOULEVARD
MIXED-USE DEVELOPMENT TRAFFIC
IMPACT STUDY UPDATE
TORRANCE - CALIFORNIA

Prepared for:

Ashai Design Consulting Corporation
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Lawndale, California 90260

Revised on:

April 12, 2021

Prepared by:

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TRAFFIC • DESIGN • PARKING • MODELING • URBAN PLANNING

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April 12, 2021

Mr. Billy Ashai,
Assistant Project Manager
Ashai Design Consulting Corporation
15900 Hawthorne Boulevard
Lawndale California 90260

Subject: 24601 Hawthorne Blvd. Mixed-Use Development Traffic Impact Study Update - Torrance, California

Dear Mr. Ashai,

As authorized, we have conducted an update of the traffic impact study prepared by KHR Associates for the subject development project, who also revised it in January 2018. The proposed mixed-use commercial/residential project is located at 24601 Hawthorne Boulevard, in the City of Torrance, California, on the northwest corner the intersection of Hawthorne Boulevard and Via Valmonte. The scope of work was based upon the request that staff of the Department of Public Works of the City of Torrance issued for the purpose of revising the proposed project's initial land use quantities, and update its impact at the above key intersection. Specifically, the purpose of the analysis was to: **a)** Prepare a Trip Generation table, showing the project's traffic generation; **b)** Perform a queuing analysis for the eastbound Via Valmonte traffic, turning left onto northbound Hawthorne Boulevard; **c)** Verify that the proposed project's revised driveway location will be compatible with the expected length of the vehicles queue on the above eastbound Via Valmonte approach; **d)** Verify that the project's potential impact upon the area transit system, bicycle network, or pedestrian network will not be significant; and **e)** Verify that the project will be consistent with the Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy (SCAG RTP/SCS);

In order to perform the subject tasks, we reviewed the KHR Associates "*Traffic Impact Study, Mixed-Use Development Project, Torrance, California*", dated January 31, 2018. Our report analyzes the traffic and transportation impacts, associated with your development upon the intersection of Hawthorne Boulevard and Via Valmonte, and contains the findings and conclusions of our study with necessary supporting data.

PROJECT DESCRIPTION

The site consists of a 23,657 square feet (SF) lot of unimproved land. The proposed project has been revised to entail an eleven (11) dwelling unit (DU) multifamily residential building, and an adjacent 3,300 gross square feet (GSF) office building

(Project) which are supported by a 36 stall parking facility located at ground level beneath the two buildings. The residential section of the Project will have 25 stalls, while the office space will utilize 11 stalls. Access to the Project will be provided by one 2-way driveway located on Via Valmonte, about 200 feet west of Hawthorne Boulevard. Both left and right turn movements will be allowed from the driveway.

Figure 1 shows the location of the subject site on a regional basis. The Project's site plan along with the proposed parking layout is shown in Figure 2. Site plans and other pertinent information concerning the proposed project were provided by Mr. Billy Ashai, of Ashai Design, the project's architects.

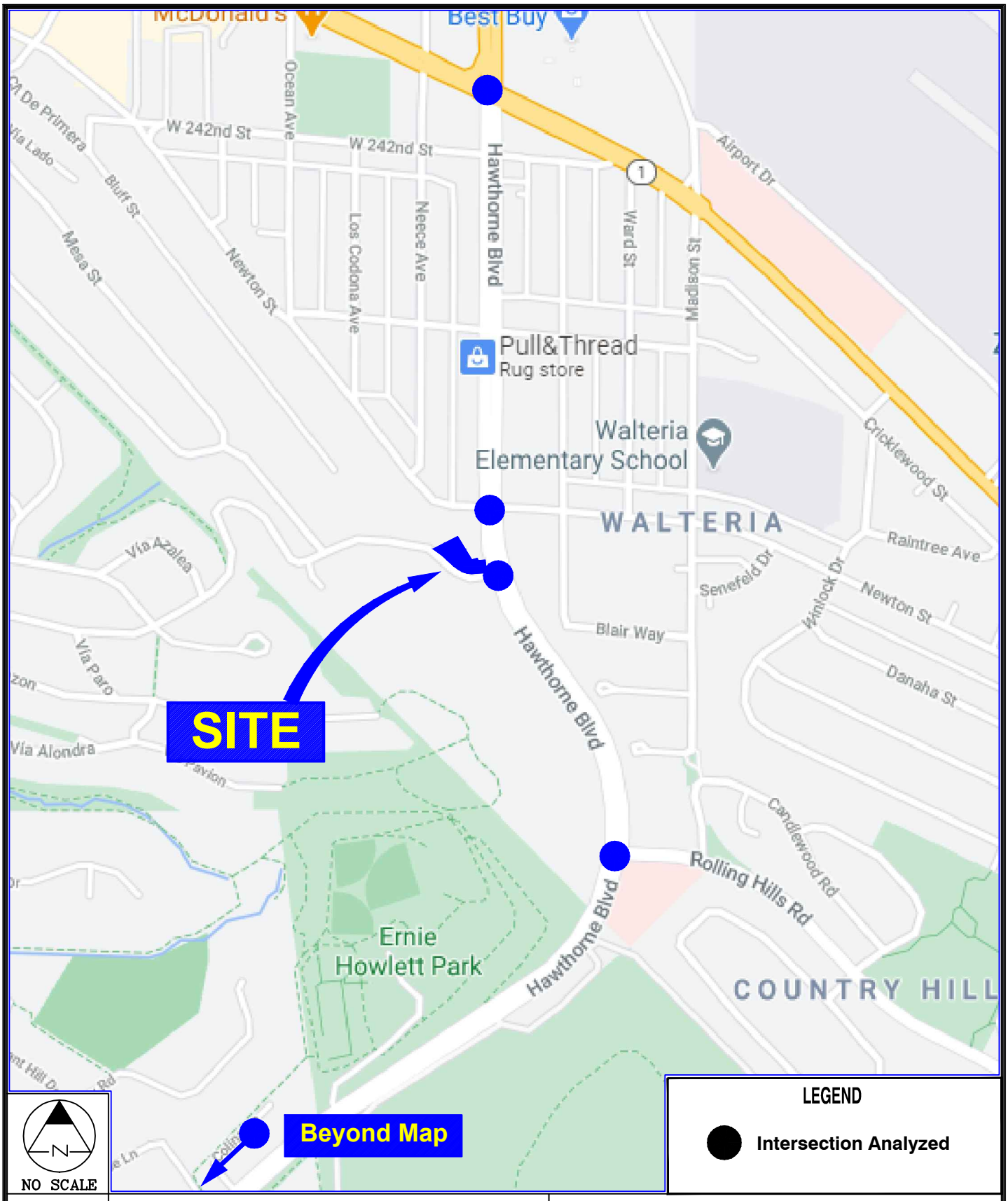
DATA SOURCES

Data contained in a traffic analysis performed for this project by KHR Associates, and published on January 31, 2018, was used in our analysis to obtain traffic counts, and project related information. Field investigations were made by our personnel to ascertain existing intersection geometry and street characteristics in the vicinity of the site and to update the above mentioned traffic study. It should be noted that, due to the current COVID-19 conditions, no new traffic counts could be taken, as at the present time, traffic is significantly lower than average, which would have provided unusually low traffic counts. Consequently, the most recent traffic counts available were used in our analysis, and where conducted in April 2016 for the KHR Associates, expanded with a 1% per year ambient traffic growth, to the year 2017, and presented in their report. The annual growth accounts for the combined effect of the increasing vehicle availability, intensification of use of existing developments and other factors. The counts were conducted during morning (AM) and evening (PM) peak periods. These AM and PM peak volumes have been used for calculation purposes and represent the critical times associated with this part of the City of Torrance.

SITE TRAFFIC GENERATION

Studies by the Institute of Transportation Engineers (ITE), Caltrans, ourselves and others have identified generalized factors which relate traffic characteristics with quantity and type of development. These traffic generation factors are useful in estimating the total future characteristics of a project yet to be constructed and occupied. Judgment is required on the part of the analyst to select the appropriate factors which best match the type of developments contemplated.

The quantity of floor area, the density of the development, the availability of public transportation, and the regional location of the project all affect the traffic generation rate. While there are many different types of uses and many parameters upon which to estimate traffic (acreage, floor area square footage, employment, etc.) the best factors for the kind of development contemplated relate to the number of dwelling units associated with the Project's residential portion, and the square footage of the office space included in the development.



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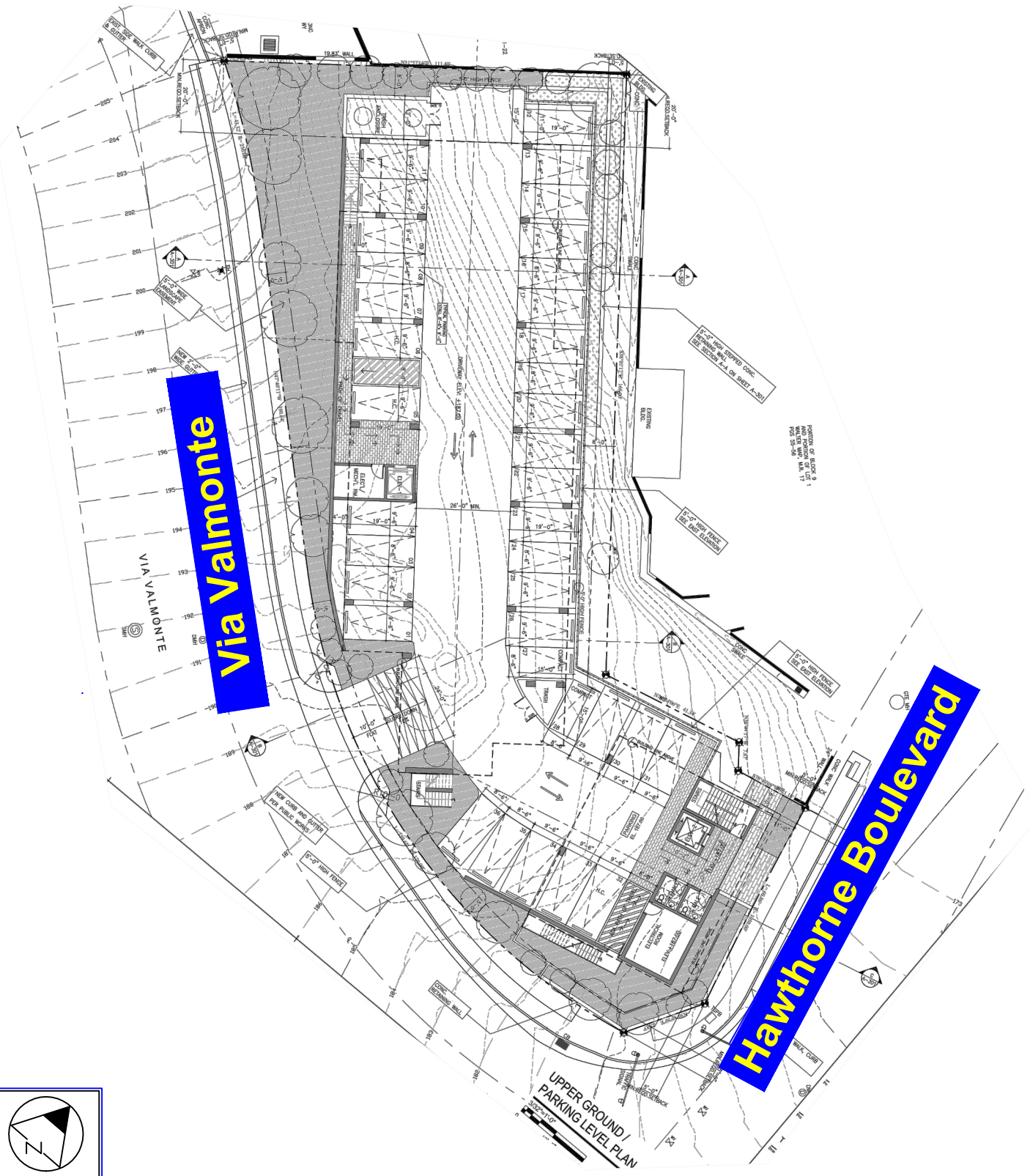
SITE LOCATION MAP

Project Name / No: 24601 Hawthorne Blvd. Mixed-Use Development Traffic Impact Study Update / 2K20040TS

Figure **1**



NO SCALE

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PARKING AND SITE PLAN

Project Name / No: 24601 Hawthorne Blvd. Mixed-Use Development Traffic Impact Study Update / 2K20040TS

Figure **2**

In order to evaluate the quantity of traffic generated by the site, ITE traffic generation factors from the 10th Edition of the Traffic Generation Manual were applied to the proposed project's land uses, for the daily and the morning and evening peak periods. The AM and PM peak hours relate to a one-hour period within the 7:00 to 9:00 AM and the 4:00 to 6:00 PM peak periods respectively.

Table 1 shows in detail the generation factors used for analysis purposes along with the related volumes, for the above mentioned conditions. The traffic generation factors used show that the Project land uses will generate a combined total of about 74 vehicle trips per day (37 inbound and 37 outbound). Similarly, during the AM commuter peak hour, they will generate a total of 35 vehicle trips (27 inbound and 8 outbound). The PM commuter peak hour traffic generation was estimated at 11 vehicle trips (5 inbound and 6 outbound). These volumes do not include any Transit Credit, internal, or pass-by trips in order to evaluate the Project's traffic impact under a "worst case scenario."

TRAFFIC DISTRIBUTION

Once the total quantity of traffic generated by a project is known, estimates are made of the directional distribution of this traffic. This will allow for an assignment of the vehicle trips to the roadway system to analyze the impacts. Figure 3 shows the site traffic distribution used in the analysis, which reflects that evaluated by KHR Associates. The values shown are expressed in terms of percentage of total traffic generated. On a regional level, it was estimated that about 45 percent of the total site traffic volumes will be oriented to and from the north; 15 percent to and from the east; 25 percent to and from the west; and 15 percent to and from the south.

Based upon the regional traffic distribution, the traffic volumes are then assigned locally to the study intersections for the AM and PM peak periods. The expected site traffic volumes were distributed to the adjacent street system based upon the KHR Associates report. Figure 4 shows the traffic assignment for the Project's inbound and outbound vehicles, expressed as percentages of the total traffic generated, at the intersections analyzed in the KHR Associates report, as well as at the Project's driveway. Similarly, Figure 5 shows the Project's morning and evening traffic volumes at the updated intersection of Hawthorne Boulevard and Via Valmonte, and at the Project driveway.

PARKING SUPPLY

In order to verify the adequacy of the proposed parking supply to support the intended land use, we conducted an analysis of the project's parking demand based upon data provided by the ITE Parking Generation Manual, 3rd Edition. The results of the analysis show the parking generation factors and the resulting number of parking stalls needed to satisfy the project's parking demand. The parking demand was evaluated using ITE factors for "General Office", land use number 710, and "Low/Mid Rise Apartments", land use number 221. The results of the analysis are shown in Table 2.

TABLE 1

PROJECT TRAFFIC GENERATION
24601 Hawthorne Boulevard Mixed-Use Development Traffic Impact Study Update - Torrance

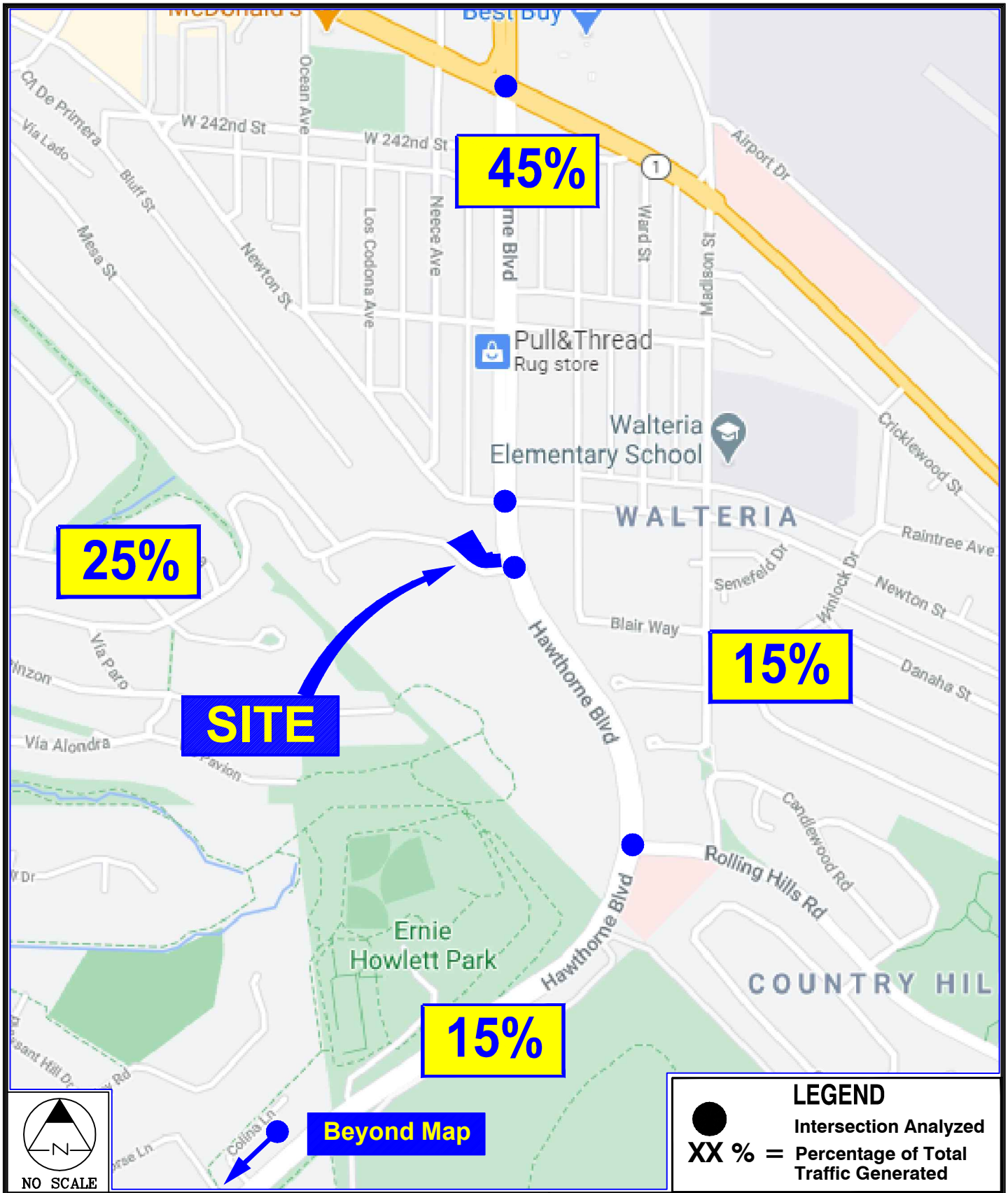
LAND USE	SIZE	UNIT	LAND USE CODE	AVERAGE DAILY TRAFFIC Trip Ends (TE) Rate (1)	AVERAGE DAILY TRAFFIC Trip Ends (TE) TE (2)	AM PEAK HOUR TE Rate (1) In	AM PEAK HOUR TE Rate (1) Out	AM PEAK HOUR Trip Ends (2) In	AM PEAK HOUR Trip Ends (2) Out	PM PEAK HOUR TE Rate (1) In	PM PEAK HOUR TE Rate (1) Out	PM PEAK HOUR Trip Ends (2) In	PM PEAK HOUR Trip Ends (2) Out
Site Proposed Project													
Low-Rise Multifamily Housing (3)	**11**	**DU**	220	3.850	42	0.110	0.350	1	4	0.350	0.210	4	2
General Office (3)	**3.300**	**KGSF**	710	9.740	32	7.740	1.260	26	4	0.329	1.607	1	4
Proposed Project Traffic Generation					**74**	**AM Peak = 35**		**27**	**8**	**PM Peak = 11**		**5**	**6**
Total Future Site Traffic Addition					**74**	*AM Total = 35*		**27**	**8**	*PM Total = 11*		**5**	**6**

Note: Traffic Generation factors per Institute of Transportation Engineers (ITE) Traffic Generation Manual 10th Edition.

1) TE Rate is the average number of Trip Ends generated per "SIZE" Unit (i.e. DU).

2) Trip End is a one-way vehicle movement entering or leaving the traffic generator.

3) Trip Ends per Average Rate (TGen Manual 10th Edition), where project size is out of the range of the Fitted Curve.



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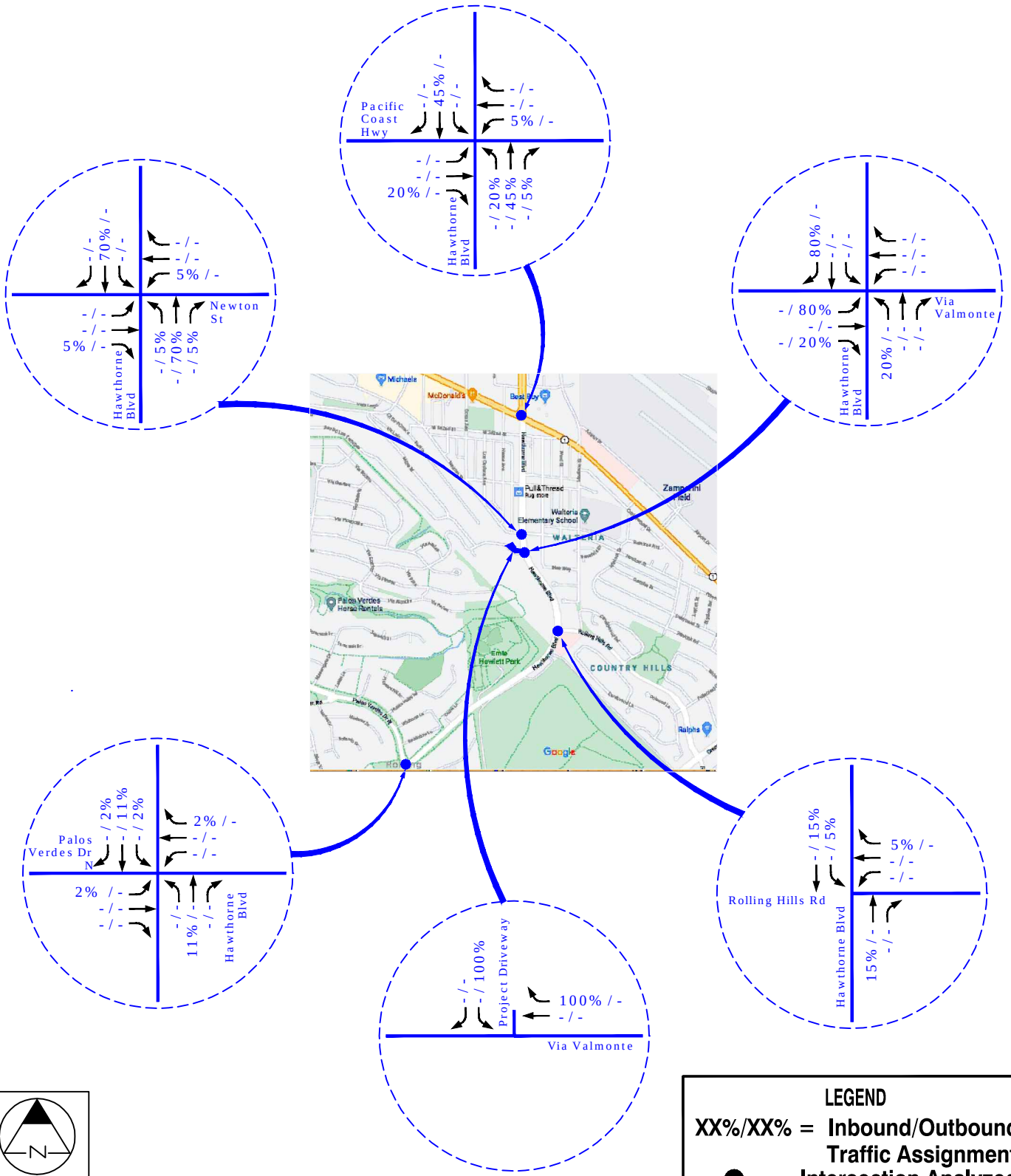
SITE REGIONAL TRAFFIC DISTRIBUTION

Project Name / No: 24601 Hawthorne Blvd. Mixed-Use Development Traffic Impact Study Update / 2K20040TS

Figure **3**



NO SCALE

LEGEND

XX%/XX% = Inbound/Outbound Traffic Assignment

● = Intersection Analyzed

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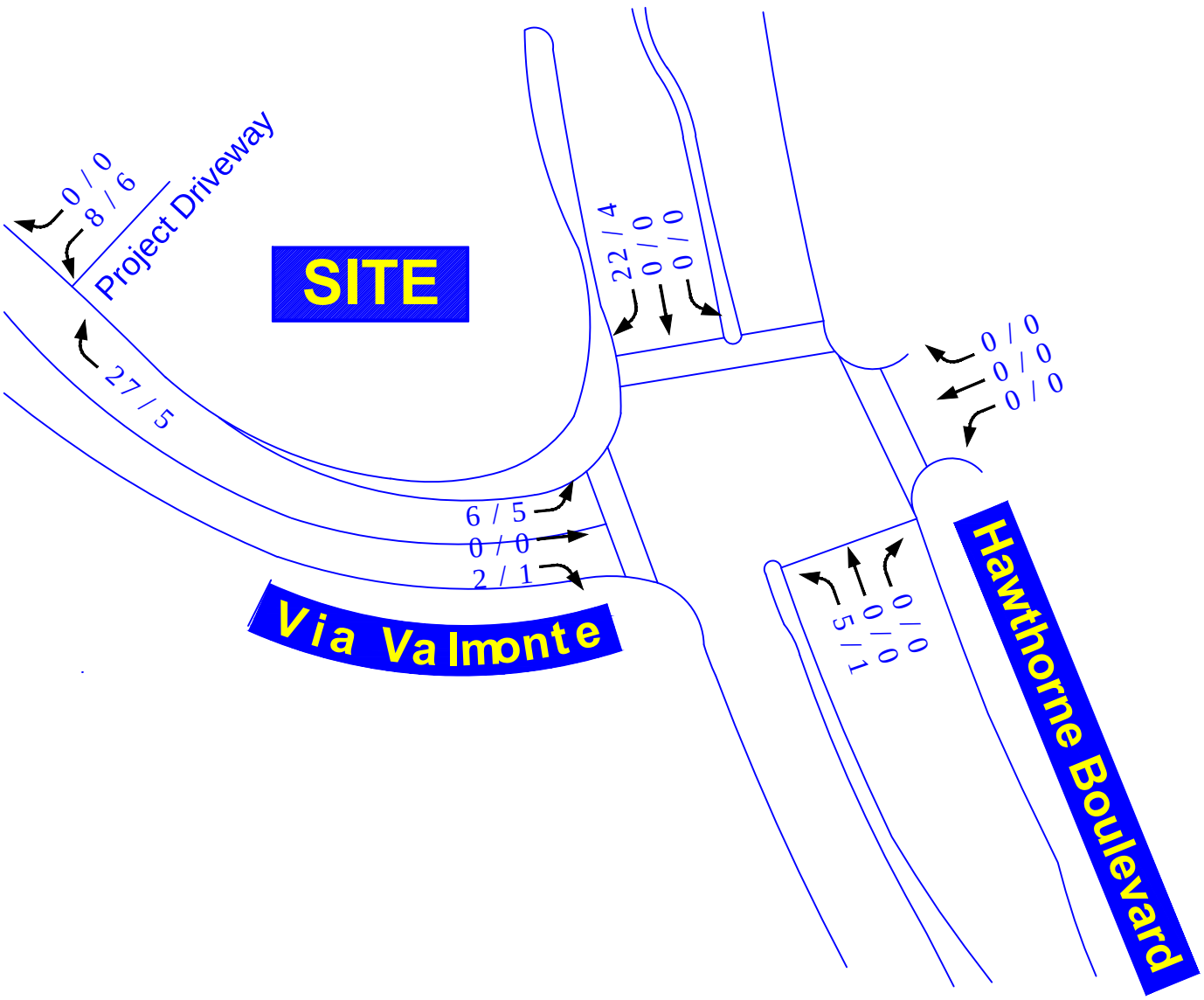
PROPOSED PROJECT TRAFFIC ASSIGNMENT

Project Name / No: 24601 Hawthorne Blvd. Mixed-Use Development Traffic Impact Study Update / 2K20040TS

Figure **4**



NO SCALE

LEGEND

XX / XX = AM/PM Peak Hour Traffic Volumes

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PROPOSED PROJECT TRAFFIC VOLUMES

Project Name / No: 24601 Hawthorne Blvd. Mixed-Use Development Traffic Impact Study Update / 2K20040TS

Figure **5**

TABLE 2

PROJECT PARKING GENERATION
24601 Hawthorne Boulevard Mixed-Use Development Traffic Impact Study Update - Torrance

LAND USE	SIZE	UNIT	LAND USE CODE	MAXIMUM # OF STALLS OCCUPIED (1) Pkg Rate	MAXIMUM # OF STALLS OCCUPIED (2) Stalls	CITY OF TORRANCE PARKING CODE (1) Pkg Rate	CITY OF TORRANCE PARKING CODE (2) Stalls	PROPOSED PARKING SUPPLY (1) Pkg Rate	PROPOSED PARKING SUPPLY (2) Stalls
Site Proposed Development									
Low-Rise Multifamily Housing	**11**	**DU**	221	1.50	17	2.27	25	2.27	25
General Office	**3.300**	**KGSF**	710	3.30	11	3.33	11	3.33	11
Total					**28**		**36**		**36**
Proposed Project's Peak Parking Needs				(77.8%)	**28**	(+100.0%)	**36**	(+100.0%)	**36**
Recommended Parking Supply (3)				(86.1%)	**31**	(100.0%)	**36**	(100.0%)	**36**

Note: Parking generation factors per ITE Parking Generation - 3rd Edition.

1) Pkg Rate is the average number of parking stalls occupied per "SIZE" Unit (i.e. KGSF).

2) Stalls indicates the maximum number of occupied parking spaces associated with the generator.

3) Maximum Number of Stalls Occupied increased by 10%.

As indicated in Table 2, the ITE Manual provides parking generation factors representing the relationship between the size of a development and its parking needs. Based upon that, the Project could have a peak parking demand of 28 stalls. It is common engineering practice to increase that value by between five to ten percent to reach the design value. The increase allows for a parking vacancy rate or to accommodate potential short term peaks. Assuming a ten percent factor, the parking design value for the proposed project is 31 parking stalls. Table 2 also reports the Project's parking demand based upon the City of Torrance Parking Code. The proposed parking supply, also is reported for comparison purposes. As indicated in Table 2, the City Code requires the project to provide 36 stalls. Consequently, the project's proposed 36 stall parking supply is in line with the City requirement and about 16% greater than the recommended parking supply. Based upon that, we estimate that the proposed development's parking supply will provide adequate parking for the planned mixed-use project. No on-street parking overflow is expected as a result of the Project.

SITE ACCESS AND INTERNAL CIRCULATION

As shown in Figure 2, the Project will be served by one 2-way driveway on Via Valmonte, about 26 feet in width, which will provide access to the proposed ground floor parking area. In order to maintain a safe sight distance for all exiting vehicles, it is recommended that landscaping in the vicinity of the parking driveway be kept below two feet in height. The Project parking facility circulation is satisfactory. Passenger car access to all parking areas is adequate and the parking facility in general has proper internal circulation. Turning radii are adequate both for ingress and egress movements. The location of the handicap parking stalls is satisfactory, with the stalls located near the buildings' pedestrian access points. We established that the internal design of the parking areas is acceptable and the development has proper circulation.

At the request of the City of Torrance a queuing analysis was performed for the eastbound approach to the Via Valmonte/Hawthorne Boulevard intersection, for the morning peak hour, which falls between 7:00 and 9:00 AM. The morning peak hour is the critical one for this location, which collects the traffic of a residential area, with significantly higher outbound movements in the morning. The purpose of the analysis is to estimate the number of vehicles that can be expected to line up at the red light, during a traffic signal cycle, under peak commuter traffic hours. In order to perform the subject analysis, we used the Synchro® Studio software, a complete suite of products which provides digital tools for traffic analyses, roadway networks modeling, optimization, and simulation applications, both for signalized and unsignalized intersections.

The results of the Synchro Queue Analysis are summarized in Table 3, with the calculation sheets reported in Appendix A. As indicated in Table 3, six traffic scenarios were evaluated in our analysis, specifically: 1) Existing traffic volumes, relating to the year 2021; 2) Scenario 1 plus Project's traffic volumes; 3) Expanded traffic volumes,

Table 3
Left Turn Queue Analysis Summary
24601 Hawthorne Boulevard Mixed-Use Development
Traffic Impact Study Update - Torrance

Via Valmonte @ Hawthorne Boulevard: Eatbound Approach - AM Peak Hour						
	Traffic Volume Condition					
	Existing (Y 2021)	Existing + Site Traffic	Expanded (Y 2022)	Expanded + Site Traffic	Y 2022 + Site w/ Mitigtn Measure (3)	Expanded (4) + Solana Traffic
50 % Confidence Factor (1)	135	140	136	141	111	109
95 % Confidence Factor (2)	223	230	224	233	183	178
Cycle Length (sec)	90	90	90	90	90	120
Length of veh in queue (ft):	25	25	25	25	25	25
Max Vehicles per Interval:	6	6	6	6	5	5
Max Vehicles per Interval:	8	9	8	9	7	7
Desirable Storage Length:	225' per Lane	230' per Lane	225' per Lane	235' per Lane	185' per Lane	180' per Lane

Note: vph = Vehicles per Hour.
1) The 50th percentile indicates that the related queue may be exceeded 50% of the times.
2) The 95th percentile indicates that the related queue may be exceeded 5% of the times.
3) Mitigation Measure consists of striping one Eastbound Right Turn Only lane.
4) Maximum queue associated with Thru Lane.

relating to the year 2022; 4) Scenario 3 plus Project's traffic volumes; 5) Scenario 4 plus the Solana Torrance residential development traffic volumes; and 6) Scenario 4 with measures mitigating the analysis intersection's eastbound traffic queue. The traffic expansion was obtained through an ambient growth rate of 1% per year. As indicated earlier in this report, the annual growth is needed to account for the combined effect of the increasing vehicle availability, intensification of use of existing developments, other possible future developments not known at the present time, and other factors.

The City requested that the Solana Torrance development be included in the analysis since this 248 dwelling units residential development will have its major access point on Via Valmonte, right across the Project's driveway. It should be noted that one of the conditions imposed upon the Solana Torrance project is to widen the eastbound approach to the intersection of Via Valmonte/Hawthorne Boulevard, in order to add one left turn lane, for a total of two eastbound lanes. In addition, the cycle length of the traffic signal at the intersection of Hawthorne/Via Valmonte will be increased to 120 seconds. Consequently, the Scenario 5 calculations reflect the future cycle length. The traffic volumes associated with the Solana Torrance project were obtained from the EIR that KHR Associates prepared for the Solana Torrance project, where it was estimated that this project is expected to add about 37 left turning vehicles to the eastbound approach being evaluated.

The City also requested the evaluation of Scenario 6 above, which relates to the event that the Solana Torrance project were not approved for development, in which case the proposed 24601 Hawthorne Boulevard Mixed-Use Development would be required to reduce the current queue (223') at the eastbound approach of the intersection of Hawthorne Boulevard at Via Valmonte. The mitigation measure would provide an additional right turn only lane at that approach, on the existing right of way.

As reported in Table 3, in Scenario 1 (Existing, 2021 traffic volumes), the queue may exceed a length of 135 feet, about 50% of the morning commuter peak hour cycles, which translates into six vehicles (with an average distance of 25 feet per vehicle). Similarly, the queue may exceed a length of 223 feet, or eight vehicles, about five times in a 100 cycle peak hour periods. In prospective, that means that this queue may be exceed about two times (40 cycles/hour x 5%) per weekday traffic conditions.

With the addition of the Project traffic, Scenario 2 shows that the queue may exceed 140 feet, or six vehicles, about 50% of the peak hour cycles, and 230 feet, or nine vehicles, five percent of the peak hour cycles. Consequently, the proposed mixed-use development traffic may increase the queue by about seven feet about two times a weekday. With expanded traffic volumes, Scenario 3 shows that in the year 2022 there would be a one foot increase in the queue length from Scenario 1 peak hour traffic conditions with 50% confidence factor, and an increase of one foot with the 95% confidence factor, and no change in the number of vehicles queued at the intersection. In Scenario 4 the Project's traffic volumes are added to the year 2022 expanded

volumes. Under those traffic conditions, the queue may exceed 141 feet, still six vehicles, about 50% of the peak hour cycles, and about 233 feet, again nine vehicles, five percent of the daily peak hour cycles. Consequently, the proposed mixed-use development traffic may increase the queue by about nine feet (233' minus 224') about two times a weekday.

Scenario 5, relates to the year 2022 with the proposed project's traffic volumes, and the restriping of the eastbound approach with one additional right turn only lane as mitigation measure, shows that the queue may exceed 111 feet, or five vehicles per lane, about 50% of the 40 peak hour cycles, and about 183 feet, or seven vehicles per lane, about five percent of the 40 daily peak hour cycles.

Scenario 6, adds the Solana Torrance development traffic volumes to Scenario 4, and the calculations show a significant reduction in the queue length. This is due to the addition of the left turning lane at the subject eastbound approach. Left turning vehicles would split between the two lanes, thus cutting the queue in about half. However, the increase in cycle length, reduces the benefit of the dual left turn lane. As indicated in Table 3, Scenario 6 shows that the queue may exceed 109 feet, or five vehicles per lane, about 50% of the 40 peak hour cycles, and about 178 feet, or seven vehicles per lane, about five percent of the 40 daily peak hour cycles, associated with the thru lane.

The above queue analysis shows that the proposed project's revised driveway location on Via Valmonte (about 198 feet from the intersection crosswalk) will be compatible with the expected length of the vehicles queue on the eastbound approach of the intersection of Hawthorne Boulevard and Via Valmonte. Table 4 shows the analysis intersection's traffic volumes for the year 2016 (traffic count year), and for all the above mentioned traffic scenarios.

TRANSIT BICYCLE AND PEDESTRIAN NETWORKS

Transit System

The City of Torrance operates the "Torrance Transit", a transit system that serves the South Bay region of the Los Angeles County. The system provides ten bus lines which run locally, within the City of Torrance, and connect it to nearby cities, downtown Los Angeles, and to the Los Angeles International Airport. However, the closest bus line to the Project, which runs along Hawthorne Boulevard, stops at Pacific Coast Highway, about 2,5 miles north of the Project. Consequently, traffic associated with the Project is not expected to have any significant impact upon the local transit system.

Bicycle Network

Class III bicycle routes exist along PCH to the north of the site, and along Rolling Hills Road, south of the site, between Hawthorne Boulevard and south of Crenshaw Boulevard. Based upon the Torrance County Bicycle Coalition and South Bay Bicycle

Table 4

Hawthorne Boulevard @ Via Valmonte Traffic Volumes

24601 Hawthorne Boulevard Mixed-Use Development
Traffic Impact Study Update - Torrance

Movement	Traffic Volumes (vph) Scenarios - AM Peak Hour					
	Traffic Count (Y 2016)	Existing (Y 2021)	Existing + Site Traffic	Expanded (Y 2022)	Expanded + Site Traffic	Expanded + Solana Traffic
Nb left	45	47	52	47	52	52
Nb Thru	1550	1628	1628	1644	1644	1649
Nb Right	36	38	38	38	38	38
Sb left	3	3	3	3	3	3
Sb Thru	950	998	998	1008	1008	1031
Sb Right	196	206	228	208	230	230
Eb Left	222	233	239	235	241	278
Eb Thru	12	13	13	13	13	13
Eb Right	66	69	71	70	72	77
Wb Left	1	1	1	1	1	1
Wb Thru	0	0	0	0	0	0
Wb Right	1	1	1	1	1	1

Movement	Traffic Volumes (vph) Scenarios - PM Peak Hour					
Nb left	62	65	66	66	67	67
Nb Thru	1167	1225	1225	1237	1237	1248
Nb Right	18	19	19	19	19	19
Sb left	16	17	17	17	17	17
Sb Thru	1611	1692	1692	1709	1709	1765
Sb Right	243	255	259	258	262	262
Eb Left	145	152	157	154	159	159
Eb Thru	3	3	3	3	3	3
Eb Right	59	62	63	63	64	67
Wb Left	13	14	14	14	14	14
Wb Thru	3	3	3	3	3	3
Wb Right	20	21	21	21	21	21

Note: vph = Vehicles per Hour.

Coalition South Bay Bicycle Master Plan, those are the only bicycle paths/routes available within the site's vicinity. In addition, bike lanes exist on Palos Verdes Drive between Ponderosa Lane and the Harbor Freeway (I-110). Due to the limited size of the Project, the potential number of bicycle riders is expected to be very minor consequently, the Project is not anticipated to have any measurable impact upon the local bicycle network. Similarly, the number of potential pedestrians associated with the Project will be extremely limited therefore, the Project is not anticipated to have any noticeable impact upon the site's surrounding pedestrian network.

SCAG RTP/SCS

The Southern California Association of Governments (SCAG) is an association of local governments and agencies that convene as a forum to address regional issues. Its primary responsibilities include the fulfillment of federal and state requirements, and the development of the 2020-2045 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS, also known as Connate SoCal), and transportation related portions of local air quality management plans. In addition, SCAG's other major functions include determining that the regional transportation plans and programs are in conformity with state air quality plans, in order to achieve regional emissions standards and greenhouse gas (GHG) reduction targets, balancing future mobility and housing needs with economic, environmental and public health goals.

At the present time, Connect SoCal entails over 4,000 transportation projects, ranging from highway improvements, railroad grade separations, bicycle lanes, new transit hubs, and replacement bridges. These projects have the potential to affect impact the established GHG reduction targets. As indicated above, the proposed Project will generate a very limited quantity of traffic, and is not considered in the Connect SoCal list of projects. In addition, the mixed-use nature of the Project, entailing residential units and office space, provides a significant opportunity to residents to work on site, in the adjacent office building. The potential reduction of the Project's vehicle miles traveled (VMT), makes it consistent with the GreenHouse Gases reduction policy. Consequently, it is reasonable to establish that the proposed 24601 Hawthorne Boulevard Mixed-Use Development project will be consistent with the Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy.

* * * * * *

SUMMARY AND CONCLUSIONS

A mixed-use residential/commercial development has been proposed to be located on the northwest corner of the intersection of Hawthorne Boulevard and Via Valmonte, in the City of Torrance, California. The parcel currently is undeveloped and consists of 23,657 square feet of land. The proposed project entails eleven dwelling unit, and a 3,300 gross square feet office building, reduced from previous plans which included 13 dwelling units, and 4,500 gross square feet of office space. Access to the Project will be provided by one 2-way driveway located on Via Valmonte, about 200 feet west of Hawthorne Boulevard.

A traffic analysis to update earlier Traffic Impact Studies was conducted to revise the proposed project's traffic impact with the revised project plan, at the adjacent intersection of Hawthorne/Via Valmonte. The analysis was conducted for the morning commuter peak hour, which is critical for the project's location, under six traffic conditions: **1.** Existing (2021) traffic volumes (Scenario 1); **2.** Existing (2021) traffic volumes plus site projects' traffic volumes (Scenario 2); **3.** Scenario 1 with traffic expansion to the year 2022 (Scenario 3); **4.** Scenario 3 (background volumes) plus site project's traffic volumes; **5.** Scenario 4 with a site related mitigation measure (stripe one additional eastbound right turn lane to the study intersection); and **6.** Scenario 4 plus the traffic volumes associated with the Solana Torrance development's currently proposed Via Valmonte access point.

It was found that:

a) the proposed project traffic generation will be significantly below the 110 daily trips which would trigger a more in depth analysis, including a VMT analysis. The area street system traffic operations, which in general are good or acceptable, will not be adversely effected by the minor increase in traffic volumes generated by the proposed project;

b) The queueing analysis showed that a maximum of nine vehicles may queue at the eastbound approach to the intersection of Hawthorne Boulevard and Via Valmonte. The maximum queue length will drop to about seven vehicles when the subject approach capacity will be increased with one additional left turn lane, as a result of the Solana Torrance development.

c) The proposed project's revised driveway location will be compatible with the expected length of the vehicles queue at the above eastbound Via Valmonte approach. The maximum queue found in the analysis may be exceed about two times per weekday during the morning peak hour, under all traffic conditions evaluated.

d) The traffic associated with the proposed project is not expected to have any significant impact upon the local transit system; it is not anticipated to have any measurable impact upon the local bicycle network. Similarly, the number of potential pedestrians associated with the proposed project will be extremely limited therefore, it will not have any noticeable impact upon the site's surrounding pedestrian network.

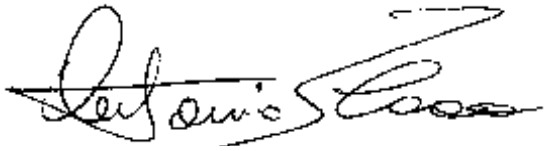
e) The proposed project's development plan is consistent with the Southern California Association of Governments Regional Transportation Plan/ Sustainable Communities Strategy. No mitigation measures were proposed, as none was necessary.

* * * * * *

Please call me if you have any questions with regard to our study. It has been a pleasure to serve you on this most interesting project.

Very truly yours,

COCO TRAFFIC PLANNERS, INC.



Dr. Antonio S. Coco, P.E.
President

ASC/gt
#2K20040TSU

APPENDIX A

SYNCHRO QUEUE ANALYSIS CALCULATION SHEETS

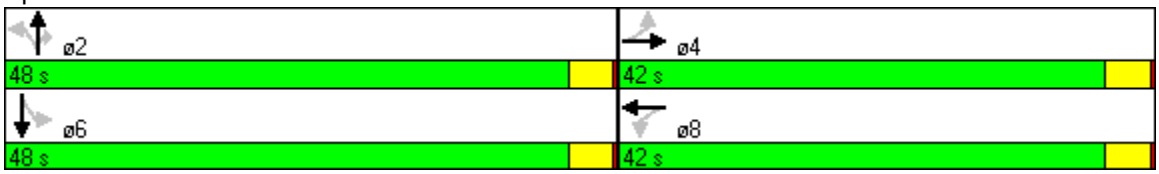
Analysis Year: 2021 Traffic
Peak Hour: 7:30 AM
1: Hawthorne Boulevard @ Via Valmonte
Condition 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Frt		0.970			0.925				0.850		0.974	
Flt Protected		0.964			0.976		0.950			0.950		
Satd. Flow (prot)	0	1742	0	0	3195	0	1770	5085	1583	1770	4953	0
Flt Permitted		0.781			0.915		0.141			0.091		
Satd. Flow (perm)	0	1411	0	0	2996	0	263	5085	1583	170	4953	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			7				41		69	
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
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3680			842			3611			3781	
Travel Time (s)		83.6			19.1			82.1			85.9	
Volume (vph)	233	13	69	1	0	1	47	1628	38	3	998	206
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	253	14	75	1	0	1	51	1770	41	3	1085	224
Lane Group Flow (vph)	0	342	0	0	2	0	51	1770	41	3	1309	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	42.0	42.0	0.0	42.0	42.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
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)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		38.0			38.0		44.0	44.0	44.0	44.0	44.0	
Actuated g/C Ratio		0.42			0.42		0.49	0.49	0.49	0.49	0.49	
v/c Ratio		0.56			0.00		0.40	0.71	0.05	0.04	0.53	
Control Delay		23.0			4.0		26.1	20.0	4.2	13.7	15.9	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		23.0			4.0		26.1	20.0	4.2	13.7	15.9	
LOS		C			A		C	C	A	B	B	
Approach Delay		23.0			4.0			19.9			15.9	
Approach LOS		C			A			B			B	
Stops (vph)		223			1		34	1215	6	3	748	
Fuel Used(gal)		12			0		2	59	1	0	44	
CO Emissions (g/hr)		821			1		123	4138	79	8	3043	
NOx Emissions (g/hr)		160			0		24	805	15	2	592	
VOC Emissions (g/hr)		190			0		29	959	18	2	705	
Dilemma Vehicles (#)		0			0		0	0	0	0	0	
Queue Length 50th (ft)		135			0		18	276	0	1	170	
Queue Length 95th (ft)		223			1		55	332	16	6	210	
Internal Link Dist (ft)		3600			762			3531			3701	
Turn Bay Length (ft)												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		607			1269		129	2486	795	83	2457	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.56			0.00		0.40	0.71	0.05	0.04	0.53	

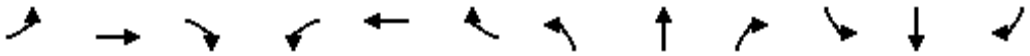
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 18.7		Intersection LOS: B	
Intersection Capacity Utilization 69.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Int



Analysis Year: 2021 w/Site Traffic
1: Hawthorne Boulevard @ Via Valmonte

Peak Hour: 7:30 AM
Condition 2



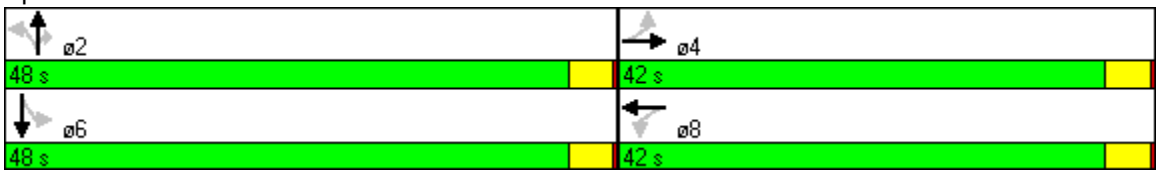
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.970			0.925				0.850		0.972	
Flt Protected		0.964			0.976		0.950			0.950		
Satd. Flow (prot)	0	1742	0	0	3195	0	1770	5085	1583	1770	4943	0
Flt Permitted		0.781			0.914		0.136			0.091		
Satd. Flow (perm)	0	1411	0	0	2992	0	253	5085	1583	170	4943	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			7				41		81	
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
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3680			842			3611			3781	
Travel Time (s)		83.6			19.1			82.1			85.9	
Volume (vph)	239	13	71	1	0	1	52	1628	38	3	998	228
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	260	14	77	1	0	1	57	1770	41	3	1085	248
Lane Group Flow (vph)	0	351	0	0	2	0	57	1770	41	3	1333	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	42.0	42.0	0.0	42.0	42.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
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)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max	Max	Max	Max	
Act Effct Green (s)		38.0			38.0		44.0	44.0	44.0	44.0	44.0	
Actuated g/C Ratio		0.42			0.42		0.49	0.49	0.49	0.49	0.49	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.58			0.00		0.46	0.71	0.05	0.04	0.54	
Control Delay		23.4			4.0		30.2	20.0	4.2	13.7	15.9	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		23.4			4.0		30.2	20.0	4.2	13.7	15.9	
LOS		C			A		C	C	A	B	B	
Approach Delay		23.4			4.0			20.0			15.9	
Approach LOS		C			A			C			B	
Stops (vph)		232			1		40	1215	6	3	762	
Fuel Used(gal)		12			0		2	59	1	0	44	
CO Emissions (g/hr)		845			1		140	4138	79	8	3098	
NOx Emissions (g/hr)		164			0		27	805	15	2	603	
VOC Emissions (g/hr)		196			0		32	959	18	2	718	
Dilemma Vehicles (#)		0			0		0	0	0	0	0	
Queue Length 50th (ft)		140			0		20	276	0	1	172	
Queue Length 95th (ft)		230			1		66	332	16	6	214	
Internal Link Dist (ft)		3600			762			3531			3701	
Turn Bay Length (ft)												
Base Capacity (vph)		607			1267		124	2486	795	83	2458	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.58			0.00		0.46	0.71	0.05	0.04	0.54	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 18.8 Intersection LOS: B
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Int



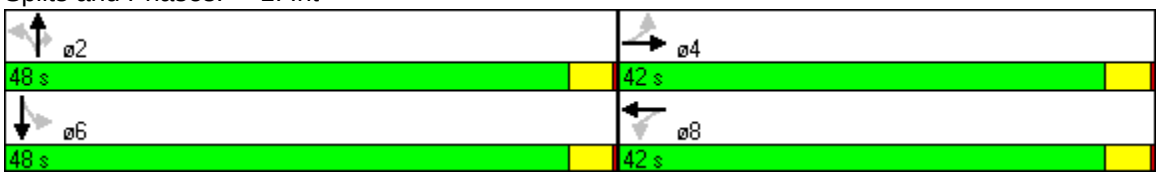
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.970			0.925				0.850		0.974	
Flt Protected		0.964			0.976		0.950			0.950		
Satd. Flow (prot)	0	1742	0	0	3195	0	1770	5085	1583	1770	4953	0
Flt Permitted		0.782			0.914		0.138			0.091		
Satd. Flow (perm)	0	1413	0	0	2992	0	257	5085	1583	170	4953	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			7				41		69	
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
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3680			842			3611			3781	
Travel Time (s)		83.6			19.1			82.1			85.9	
Volume (vph)	235	13	70	1	0	1	47	1644	38	3	1008	208
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	255	14	76	1	0	1	51	1787	41	3	1096	226
Lane Group Flow (vph)	0	345	0	0	2	0	51	1787	41	3	1322	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	42.0	42.0	0.0	42.0	42.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
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)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max	Max	Max	Max	
Act Effct Green (s)		38.0			38.0		44.0	44.0	44.0	44.0	44.0	
Actuated g/C Ratio		0.42			0.42		0.49	0.49	0.49	0.49	0.49	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.57			0.00		0.40	0.72	0.05	0.04	0.54	
Control Delay		23.0			4.0		26.8	20.2	4.2	13.7	16.0	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		23.0			4.0		26.8	20.2	4.2	13.7	16.0	
LOS		C			A		C	C	A	B	B	
Approach Delay		23.0			4.0			20.0			16.0	
Approach LOS		C			A			C			B	
Stops (vph)		225			1		34	1233	6	3	759	
Fuel Used(gal)		12			0		2	60	1	0	44	
CO Emissions (g/hr)		826			1		124	4184	79	8	3076	
NOx Emissions (g/hr)		161			0		24	814	15	2	598	
VOC Emissions (g/hr)		192			0		29	970	18	2	713	
Dilemma Vehicles (#)		0			0		0	0	0	0	0	
Queue Length 50th (ft)		136			0		18	280	0	1	172	
Queue Length 95th (ft)		224			1		56	336	16	6	213	
Internal Link Dist (ft)		3600			762			3531			3701	
Turn Bay Length (ft)												
Base Capacity (vph)		608			1267		126	2486	795	83	2457	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.57			0.00		0.40	0.72	0.05	0.04	0.54	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 18.8 Intersection LOS: B
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Int



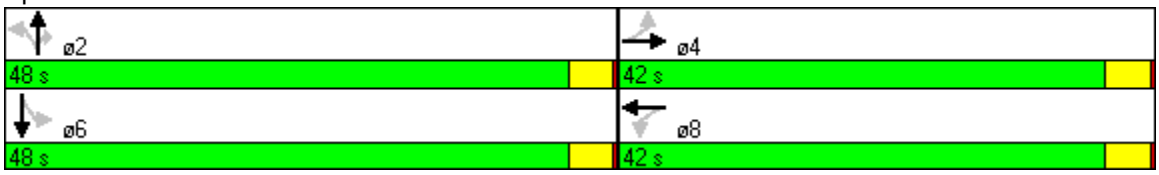
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.970			0.925				0.850		0.972	
Flt Protected		0.964			0.976		0.950			0.950		
Satd. Flow (prot)	0	1742	0	0	3195	0	1770	5085	1583	1770	4943	0
Flt Permitted		0.781			0.914		0.133			0.091		
Satd. Flow (perm)	0	1411	0	0	2992	0	248	5085	1583	170	4943	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			7				41		81	
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
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3680			842			3611			3781	
Travel Time (s)		83.6			19.1			82.1			85.9	
Volume (vph)	241	13	72	1	0	1	52	1644	38	3	1008	230
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	14	78	1	0	1	57	1787	41	3	1096	250
Lane Group Flow (vph)	0	354	0	0	2	0	57	1787	41	3	1346	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	42.0	42.0	0.0	42.0	42.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	46.7%	46.7%	0.0%	46.7%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
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)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max	Max	Max	Max	
Act Effct Green (s)		38.0			38.0		44.0	44.0	44.0	44.0	44.0	
Actuated g/C Ratio		0.42			0.42		0.49	0.49	0.49	0.49	0.49	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.58			0.00		0.47	0.72	0.05	0.04	0.55	
Control Delay		23.5			4.0		31.2	20.2	4.2	13.7	16.0	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		23.5			4.0		31.2	20.2	4.2	13.7	16.0	
LOS		C			A		C	C	A	B	B	
Approach Delay		23.5			4.0			20.2			16.0	
Approach LOS		C			A			C			B	
Stops (vph)		233			1		41	1233	6	3	773	
Fuel Used(gal)		12			0		2	60	1	0	45	
CO Emissions (g/hr)		853			1		141	4184	79	8	3131	
NOx Emissions (g/hr)		166			0		27	814	15	2	609	
VOC Emissions (g/hr)		198			0		33	970	18	2	726	
Dilemma Vehicles (#)		0			0		0	0	0	0	0	
Queue Length 50th (ft)		141			0		21	280	0	1	175	
Queue Length 95th (ft)		233			1		#68	336	16	6	216	
Internal Link Dist (ft)		3600			762			3531			3701	
Turn Bay Length (ft)												
Base Capacity (vph)		607			1267		121	2486	795	83	2458	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.58			0.00		0.47	0.72	0.05	0.04	0.55	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Int



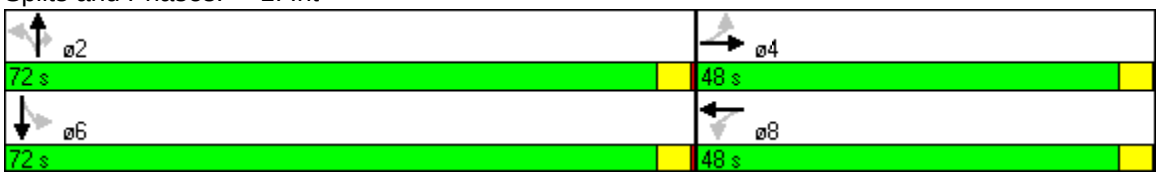
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.942			0.925				0.850		0.973	
Flt Protected	0.950	0.973			0.976		0.950			0.950		
Satd. Flow (prot)	1681	1622	0	0	3195	0	1770	5085	1583	1770	4948	0
Flt Permitted	0.756	0.973			0.920		0.142			0.074		
Satd. Flow (perm)	1338	1622	0	0	3012	0	265	5085	1583	138	4948	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			14				41		69	
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
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3680			842			3611			3781	
Travel Time (s)		83.6			19.1			82.1			85.9	
Volume (vph)	278	13	77	1	0	1	52	1649	38	3	1031	230
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	302	14	84	1	0	1	57	1792	41	3	1121	250
Lane Group Flow (vph)	183	217	0	0	2	0	57	1792	41	3	1371	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	48.0	48.0	0.0	48.0	48.0	0.0	72.0	72.0	72.0	72.0	72.0	0.0
Total Split (%)	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%	60.0%	60.0%	60.0%	60.0%	60.0%	0.0%
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)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max	Max	Max	Max	
Act Effct Green (s)	44.0	44.0			44.0		68.0	68.0	68.0	68.0	68.0	
Actuated g/C Ratio	0.37	0.37			0.37		0.57	0.57	0.57	0.57	0.57	

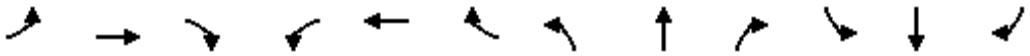
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.37	0.35			0.00		0.38	0.62	0.04	0.04	0.48	
Control Delay	30.7	25.6			0.0		23.7	18.6	3.6	13.3	15.3	
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	30.7	25.6			0.0		23.7	18.6	3.6	13.3	15.3	
LOS	C	C			A		C	B	A	B	B	
Approach Delay		27.9			0.0			18.4			15.3	
Approach LOS		C			A			B			B	
Stops (vph)	121	124			0		30	1053	5	2	682	
Fuel Used(gal)	7	7			0		2	58	1	0	45	
CO Emissions (g/hr)	457	522			1		131	4088	79	8	3137	
NOx Emissions (g/hr)	89	102			0		26	795	15	1	610	
VOC Emissions (g/hr)	106	121			0		30	947	18	2	727	
Dilemma Vehicles (#)	0	0			0		0	0	0	0	0	
Queue Length 50th (ft)	108	109			0		23	323	0	1	209	
Queue Length 95th (ft)	176	178			0		63	372	16	6	247	
Internal Link Dist (ft)		3600			762			3531			3701	
Turn Bay Length (ft)												
Base Capacity (vph)	491	614			1113		150	2882	915	78	2834	
Starvation Cap Reductn	0	0			0		0	0	0	0	0	
Spillback Cap Reductn	0	0			0		0	0	0	0	0	
Storage Cap Reductn	0	0			0		0	0	0	0	0	
Reduced v/c Ratio	0.37	0.35			0.00		0.38	0.62	0.04	0.04	0.48	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 18.3 Intersection LOS: B
Intersection Capacity Utilization 62.3% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Int





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850		0.925				0.850		0.972	
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1779	1583	0	3195	0	1770	5085	1583	1770	4943	0
Flt Permitted		0.736			0.918		0.133			0.091		
Satd. Flow (perm)	0	1371	1583	0	3005	0	248	5085	1583	170	4943	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54		7				41		81	
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
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3680			842			3611			3781	
Travel Time (s)		83.6			19.1			82.1			85.9	
Volume (vph)	241	13	72	1	0	1	52	1644	38	3	1008	230
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	14	78	1	0	1	57	1787	41	3	1096	250
Lane Group Flow (vph)	0	276	78	0	2	0	57	1787	41	3	1346	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phases	4	4	4	8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	42.0	42.0	42.0	42.0	42.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	46.7%	46.7%	46.7%	46.7%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		Max	Max	Max	Max	Max	
Act Effct Green (s)		38.0	38.0		38.0		44.0	44.0	44.0	44.0	44.0	
Actuated g/C Ratio		0.42	0.42		0.42		0.49	0.49	0.49	0.49	0.49	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.48	0.11		0.00		0.47	0.72	0.05	0.04	0.55	
Control Delay		22.3	7.3		4.0		31.2	20.2	4.2	13.7	16.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		22.3	7.3		4.0		31.2	20.2	4.2	13.7	16.0	
LOS		C	A		A		C	C	A	B	B	
Approach Delay		19.0			4.0			20.2			16.0	
Approach LOS		B			A			C			B	
Stops (vph)		180	18		1		41	1233	6	3	773	
Fuel Used(gal)		9	2		0		2	60	1	0	45	
CO Emissions (g/hr)		659	159		1		141	4184	79	8	3131	
NOx Emissions (g/hr)		128	31		0		27	814	15	2	609	
VOC Emissions (g/hr)		153	37		0		33	970	18	2	726	
Dilemma Vehicles (#)		0	0		0		0	0	0	0	0	
Queue Length 50th (ft)		111	8		0		21	280	0	1	175	
Queue Length 95th (ft)		183	34		1		#68	336	16	6	216	
Internal Link Dist (ft)		3600			762			3531			3701	
Turn Bay Length (ft)												
Base Capacity (vph)		579	700		1273		121	2486	795	83	2458	
Starvation Cap Reductn		0	0		0		0	0	0	0	0	
Spillback Cap Reductn		0	0		0		0	0	0	0	0	
Storage Cap Reductn		0	0		0		0	0	0	0	0	
Reduced v/c Ratio		0.48	0.11		0.00		0.47	0.72	0.05	0.04	0.55	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 18.5 Intersection LOS: B
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Int