Overland Traffic Consultants, Inc.
952 Manhattan Beach Boulevard, # 100
Manhattan Beach, CA 90266
Phone (310) 545-1235
E-mail: liz@overlandtraffic.com

October 18, 2024

Mr. Steve Kaplan
Attorney
16130 Ventura Boulevard, Suite 140
Encino, CA 91436

RE: Evaluation of Potential Traffic Signal at LaCienega Boulevard and Knowlton Street

Overland Traffic Consultants conducted an evaluation of the potential need for a new traffic signal at the intersection of La Cienega Boulevard and Knowlton Street. The intersection is currently controlled with a stop sign at Knowlton Street only. Multiple elements are considered in the determination of the need for a traffic signal. These include major and minor street traffic volumes, visibility, roadway progression, proximity to schools, pedestrian volumes, and accident data. The City of Los Angeles requires a traffic signal warrant analysis to consider the installation of new traffic signals. The State of California has established "Warrants" to determine if traffic signal control is required at an intersection. A signal analysis was conducted utilizing Los Angeles Department of Transportation (LADOT) Traffic Signal Warrant Worksheets (revised 8-10-2020) based on the State Warrants incorporating size of the community, traffic volumes, lane configurations, speed limits, distances to other controls, peak hour delay, accidents, number of pedestrians and number of cyclists.

It is common traffic engineering practice to use the Signal Warrant Analysis as a tool to determine if a traffic signal is needed. Meeting one or even more than one traffic signal warrant does not necessarily mean that a traffic signal is the preferred approach to improve traffic conditions at a location. Other items are also considered including potential degradation to progression, alternative improvements such as widening or other traffic controls. The input information for the signal analysis is the same as the intersection analysis. Six to eight hours of peak hour traffic data are considered for potentially meeting traffic signal warrants. Six hours of peak hour data was collected in the evaluation of this intersection. The traffic data collected during the AM and PM peak periods was input into the software and comparisons to the relevant tables and graphs were conducted to determine if a traffic signal was warranted. Note that if Warrant 1 (Eight Hour Vehicle Volume Warrant) was found to be warranted using the six hours of data, an additional two hours of data would be collected to determine if Warrant 1 is met.

The traffic lanes, traffic volumes, and pedestrians, as indicated in the count information and the count information + future growth + project were used in the signal analysis.

A brief explanation of the eleven traffic signal warrants[1] is provided below and on the following pages.

Warrant 1 – Eight-Hour Vehicular Volume

There are two conditions for this warrant. Condition A is the Minimum Vehicular Volume Warrant intended for applications at intersections where large volumes of traffic are the principal reason to consider a new traffic signal. Condition B is the Interruption of Continuous Traffic Warrant intended for use at intersection where the Minimum Vehicular Volume warrant isn't likely to be met, but the main street volumes are high and create excessive delay or conflict for minor street traffic. Either or both conditions may be met for this warrant to be satisfied. The traffic volumes at this intersection do not meet this warrant.

Warrant 2 – Four Hour Vehicular Volume

This warrant's conditions are intended to be met when the high volume of peak hour intersecting traffic is the primary reason for the need of a traffic signal. Four hours of data are evaluated under this warrant. The traffic volumes at this intersection do not meet this warrant.

Warrant 3 – Peak Hour

The Peak Hour Warrant is intended for use at a location where the minor street encounters undue delay when entering or crossing the major street for at least one hour of a typical day. This is applied only in unusual circumstances such as large office complexes, manufacturing plants, industrial complexes, or facilities that attract or discharge large numbers of vehicles over a short period of time. This warrant does not apply to this project.

Warrant 4 – Pedestrian Volume

Two conditions must be met for the Pedestrian Volume warrant to be considered met. At least 100 pedestrians per hour are required for a minimum of four hours or at least 190 pedestrians within one hour. The second condition checks if a new signal will restrict traffic flow and if there are adequate gaps for pedestrians to cross.

[1] *Based on Warrants 8 User Guide – Copyright 2011 Trafficware Ltd. Page 5-29. LADOT Traffic Signal Warrants Sheets Used in Analysis*

The Pedestrian Volume Warrant is intended for use when high volumes of pedestrians encounter extensive delays in crossing a high-volume major street. The pedestrian volumes are very low.

Warrant 5 – School Crossing

This warrant is for use when school children are crossing a major street. The School Crossing Warrant is intended for use where school children crossing the intersection are the primary reason for considering installation of a new traffic signal. The Project is not adjacent to a school.

Warrant 6 – Coordinated Signal System

Occasionally, to maintain proper progressive movement of vehicles through a signal system, it is necessary to install a new traffic signal at a location where it would not otherwise be necessary. This warrant is not met.

Warrant 7 – Crash Experience

Locations where there are frequent and severe accidents are occasionally considered for installation of a traffic signal if such installation will reduce the frequency and/or severity of the accidents. Traffic accident data was based on Transportation Injury Mapping System Berkeley SafeTREC. Five years of data were evaluated to determine the highest accident experience in the five past years. This warrant was not met.

Warrant 8 – Roadway Network

This Warrant uses information from Warrants 1, 2 and 3. It would be met if the new traffic signal encouraged concentration and organization of traffic flow on a roadway network. The proximity of this intersection from La Cienega Boulevard and Centinela Boulevard was such that this warrant was not met.

Warrant 9 – Intersection Near a Grade Crossing

This Warrant is considered when an intersection is near a grade crossing. The study intersections are not near a grade crossing and this Warrant is not applicable.

Warrant 10 – Bicycles

This Warrant considers the traffic and cyclist volume, accidents including cyclists and the roadway configurations in the area. This warrant was not met.

Warrant 11 – Activated Pedestrian Warning Device

Signal warrants analysis was conducted under existing and future conditions with and without the Project. Pedestrian volumes do not meet the requirements for a Pedestrian Warning Device.

As shown below in Table 1 summary of traffic signal warrant analysis results on the following page, none of the traffic signal warrants were met. Evaluation was conducted using Future 2025 With the 5227 Knowlton Street Project traffic volumes as this would be the highest volume experienced in the LADOT approved data. The detailed signal warrant sheets are provided in Attachment A.

Table 1
Traffic Signal Warrant Analysis Results

La Cienega Boulevard and Knowlton Street		EXISTING 2024	EXISTING + PROJECT	FUTURE 2025 WITHOUT PROJECT	FUTURE 2025 WITH PROJECT
Warrant 1	Eight-Hour Vehicular Volume	Not Met	Not Met	Not Met	Not Met
Warrant 2	Four-Hour Vehicular Volume	Not Met	Not Met	Not Met	Not Met
Warrant 3	Peak Hour	n/a	n/a	n/a	n/a
Warrant 4	Pedestrian Volume	Not Met	Not Met	Not Met	Not Met
Warrant 5	School Crossing	n/a	n/a	n/a	n/a
Warrant 6	Coordinated Signal System	Not Met	Not Met	Not Met	Not Met
Warrant 7	Crash Experience Warrant	Not Met	Not Met	Not Met	Not Met
Warrant 8	Roadway Network	Not Met	Not Met	Not Met	Not Met
Warrant 9	Intersection Near a Grade Crossing	n/a	n/a	n/a	n/a
Warrant 10	Bicycles	Not Met	Not Met	Not Met	Not Met
Warrant 11	Pedestrian Activated Yellow Flashing Beacons	Not Met	Not Met	Not Met	Not Met

No traffic signal warrants are met without or with the proposed 5227 Knowlton Street project. LADOT would not be able to warrant at traffic signal at this location at this time. It is apparent from the evaluation of the data, that motorists do not frequently turn left from Knowlton Street to northbound La Cienega Boulevard. The existing traffic signal at the west end of Knowlton Street is likely the preferred option to facilitate this movement. This traffic signal can be used to facilitate northbound movement from the roadway.

Please contact me if you have any questions.

Sincerely,

Liz Fleming

FUTURE 2025
WITH PROJECT

Traffic Signal Warrants Worksheet

SR#

DATE 10/16/24 PREPARER lf REVIEWER

MAJOR ST: LA CIENEGA BL

MINOR ST: KNOWLTON ST

Critical Approach Speed MPH or Speed Limit MPH 35

Speed limit or critical speed on major street traffic > 40 mph ☐
or
In built up area of isolated community of < 10,000 population ☐

RURAL (R) ☒ URBAN (U)

Eight-Hour Vehicular Volume — WARRANT 1

N/A ☐
SATISFIED YES ☐
NO ☒

☆ The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal ☆

a. Condition A or Condition B or combination of 80% of both parts A and B must be satisfied.

b. A 6-hour Manual Count may be used in a determination that this warrant is not met. However, supplement manual counts should be taken during separate hours for a determination that this warrant is met.

c. In applying each condition, the major street and minor street volumes shall be for the same hours. On the minor street, the higher volume does not need to be the same approach during each of the hours.

d. The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count.

e. Figure 4C-103(CA) should be used for new intersections, significantly reconstructed intersections, where near-term land development will result in increased volumes, or where it is not reasonable to use current traffic volumes.

f. Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. This site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles. Similar engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one -lane approach with only the traffic volume in the through/left-turn lane considered.

g. At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher volume of the major-street left-turn volumes plus the higher volume minor-street approach as the “minor street” volume and both approaches of the major street minus the higher of the major-street left-turn volume as “major street” volume. In these cases, engineering judgment should be used to determine if left-turn phasing is necessary to accommodate the high volume of left-turn traffic.

Eight-Hour Vehicular Volume WARRANT 1 (continued)

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal

Condition A

Minimum Vehicle Volume

SATISFIED	YES	NO
100%	☐	☒
80%	☐	☒

RIGHT TURN REDUCTION APPLICATION *MINOR STREET* (If Yes, fill in percentage) ☐ ☒ 50 %

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOW IN BRACKETS) 1 ✓ U	R	2 or More ✓ U	R	Hours 08:00	09:00	10:00		15:00	16:00	17:00	
Both Approach Major Street	500 (400)	350 (280)	600 ✓ (480)✓	420 (336)	4462	4320	3983		4078	4240	4212	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	42	35	36		77	78	66	

Condition B

Interruption of Continuous Traffic

SATISFIED	YES	NO
100%	☐	☒
80%	☐	☒

RIGHT TURN REDUCTION APPLICATION *MINOR STREET* (If Yes, fill in percentage) ☐ ☒ 50 %

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOW IN BRACKETS) 1 U	R	2 or More U	R	Hours 08:00	09:00	10:00		15:00	16:00	17:00	
Both Approach Major Street	750 (600)	525 (420)	900 ✓ (720)✓	630 (504)	4462	4320	3983		4078	4240	4212	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	42	35	36		77	78	66	

COMBINATION OF A & B

SATISFIED	YES	NO
	☐	☒

REQUIREMENT	CONDITION	✓	FULFILLED YES	NO
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		☐	☒
	AND			
	B. INTERRUPTION OF CONTINUOUS TRAFFIC			
AND AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			☐	☐

Eight-Hour Vehicular Volume — WARRANT 1 (continued)

☆ The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal ☆

Projected Volumes

	N/A	☒
SATISFIED	YES	NO
	☐	☐

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)
Based on Estimated Average Daily Traffic - see *Note

URBAN ☐	RURAL ☐	Minimum Requirements Estimated Average Daily Traffic			
CONDITION A - Minimum Vehicular Volume Satisfied ☐ Not Satisfied ☐		Vehicles Per Day On Major Street (Total of Both Approaches)		Vehicles Per Day On Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach		Urban	Rural	Urban	Rural
Major Street	Minor Street				
1	1	8,000	5,600	2,400	1,680
2 or More	1	9,600	6,720	2,400	1,680
2 or More	2 or More	9,600	6,720	3,200	2,240
1	2 or More	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic Satisfied ☐ Not Satisfied ☐		Vehicles Per Day On Major Street (Total of Both Approaches)		Vehicles Per Day On Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach		Urban	Rural	Urban	Rural
Minor Street	Minor Street				
1	1	12,000	8,400	1,200	850
2 or More	1	14,400	10,080	1,200	850
2 or More	2 or More	14,400	10,080	1,600	1,120
1	2 or More	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B Satisfied ☐ Not Satisfied ☐		2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% or more..... A ____ B ____					

** **Note:** To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes*

Four-Hour Vehicular Volume

WARRANT 2

N/A ☐
SATISFIED YES ☐
NO ☒

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. Record hourly vehicle volumes for the highest four hours of an average day.

b. In applying each condition, the major street and minor street volumes shall be for the same hours. On the minor street, the higher volume does not need to be the same approach during each of the hours.

c. The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count.

d. Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. This site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles. Similar engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.

e. At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher volume of the major-street left-turn volumes plus the higher volume minor-street approach as the “minor street” volume and both approaches of the major street minus the higher of the major-street left-turn volume as “major street” volume. In these cases, engineering judgment should be used to determine if left-turn phasing is necessary to accommodate the high volume of left -turn traffic.

APPROACH LANES	One	2 or More	Hours 08:00	15:00	16:00	17:00
Both Approaches - Major Street		✓	4462	4078	4240	4212
Higher Approach - Minor Street	✓		42	77	78	66

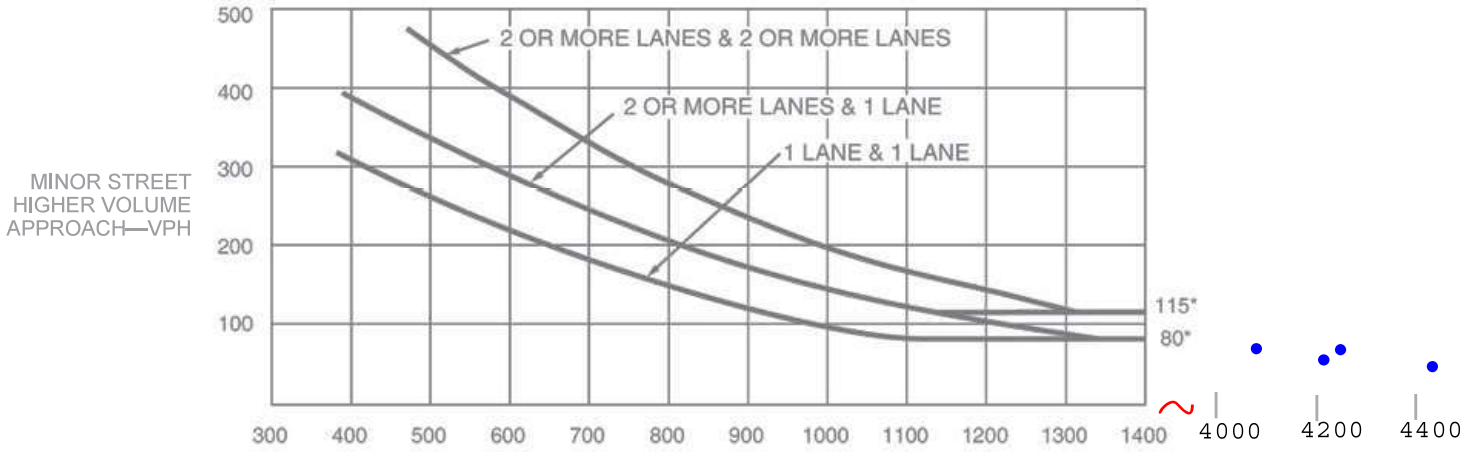
	YES	NO
RIGHT TURN REDUCTION APPLICATION *MINOR STREET*	☒	☐
(If Yes, fill in percentage)	50 %	

* All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	☐	☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)		

Four-Hour Vehicular Volume WARRANT 2 (continued)

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

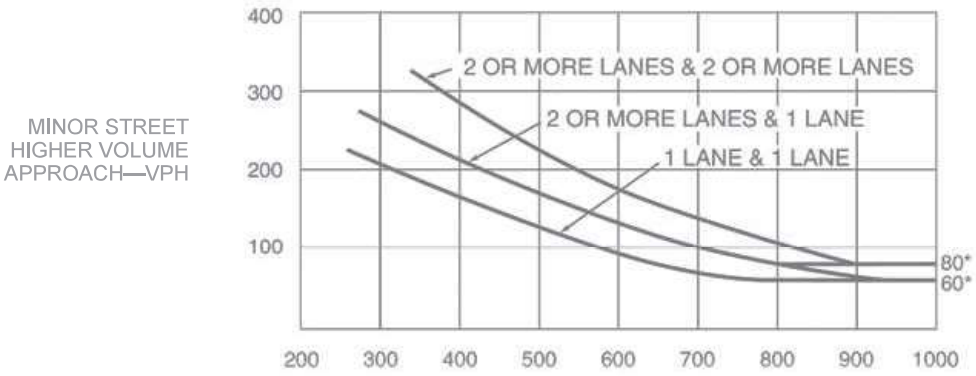
URBAN
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



MAJOR STREET—TOTAL OF BOTH APPROACHES—VEHICLES PER HOUR (VPH)

**Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.*

RURAL
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)



MAJOR STREET—TOTAL OF BOTH APPROACHES—VEHICLES PER HOUR (VPH)

**Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.*

Peak Hour WARRANT 3

N/A ☒

SATISFIED YES ☐ NO ☐

☆ The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal ☆

a. Part A or Part B must be satisfied.
b. This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.
c. In applying each condition, the major street and minor street volumes shall be for the same hours.
d. The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count.
e. Estimated Peak Hour Volumes may be used for new intersections, significantly reconstructed intersections, or where near-term land development will result in increased volumes.
f. Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. This site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles. Similar engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.
g. At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher volume of the major-street left-turn volumes plus the higher volume minor-street approach as the "minor street" volume and both approaches of the major street minus the higher of the major-street left-turn volume as "major street" volume. In these cases, engineering judgment should be used to determine if left-turn phasing is necessary to accommodate the high volume of left-turn traffic.

Unusual facility per Note b.	YES ☐	NO ☐

Name _____

PART A

	SATISFIED	YES	NO
All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)		☐	☐

	YES	NO	N/A
1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	☐	☐	☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	☐	☐	☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	☐	☐	☐

PART B

	SATISFIED	YES	NO
		☐	☐

APPROACH LANES	One	2 or More	Hour 16:00
Both Approaches - Major Street		✓	4240
Higher Approach - Minor Street	✓		78

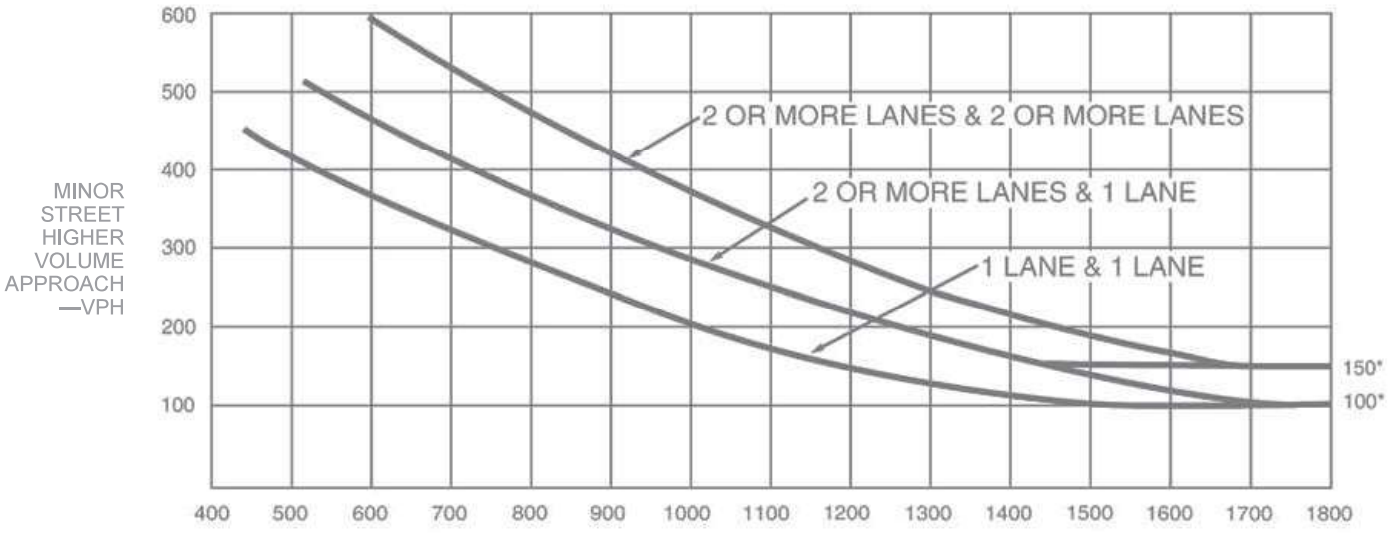
RIGHT TURN REDUCTION APPLICATION *MINOR STREET*	YES ☐	NO ☐
(If Yes, fill in percentage)	_____ %	

	YES	NO
The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	☐	☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)		

Peak Hour WARRANT 3 (continued)

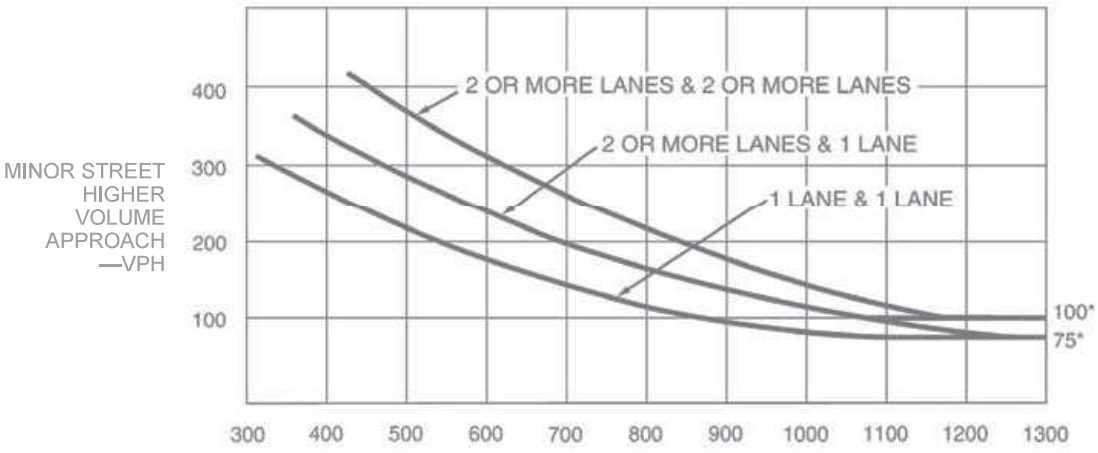
✯ The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal ✯

URBAN
Figure 4C-3. Warrant 3, Peak Hour



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.*

RURAL
Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
(Community Less Than 10,000 Population or Above 40 MPH on Major Street)



** Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.*

Pedestrian Volume

WARRANT 4

N/A ☐

SATISFIED YES ☐

NO ☒

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. Parts 1 and 2 shall be satisfied.
b. The pedestrian volume criterion may be reduced by as much as 50% if the 15th percentile speed of the pedestrians is less than 3.5 feet/second.
c. Estimated pedestrian volumes may be used where nearby, near-term land use development has been approved for construction.
d. In applying each condition, the total vehicles per hour on the major street (on both approaches) and the total pedestrians per hour crossing the major street shall be for the same hours.
e. The Pedestrian Volume signal warrants shall not be applied at locations where the distance to the nearest traffic control signal or STOP sign controlling the street that pedestrians desire to cross is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of traffic.
f. Traffic control signal may not be needed at the study location if adjacent coordinated traffic control signals consistently provide gaps of adequate length for pedestrians to cross the street.
g. If it is considered at a non-intersection crossing, the traffic control signal should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs. If the traffic control signal is installed at a non-intersection crossing, at least one of the signal faces should be over the traveled way for each approach, parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the crosswalk or site accommodations should be made through curb extensions or other techniques to provide adequate sight distance, and the installation should include suitable standard signs and pavement markings.
h. Bicycles may be counted as pedestrians.
i. Pedestrian Hybrid Beacons may be considered instead of a traffic signal if a device is recommended based upon pedestrian needs

PART 1 (A or B must be satisfied)

SATISFIED	YES	NO
	☐	☒

A. FOUR-HOUR PEDESTRIAN VOLUMES

	Hours: 9:00			
Vehicles per hour on major street for 4 hours	4320			
Pedestrians crossing major street per hour for highest 4 hours	3	0	0	0

(FIGURE 4C-5 OR 4C-6 SATISFIED)

SATISFIED	YES	NO
100%	☐	☒
80%	☐	☒
50%	☐	☒
15% WALKING RATE	_____ fps	

B. ONE HOUR PEDESTRIAN VOLUMES

	Hour: 09:00
Vehicles per hour on major street for 1 hour	4320
Pedestrians crossing major street per hour for highest 1 hour	3

(FIGURE 4C-7 or 4C-8 SATISFIED)

SATISFIED	YES	NO
100%	☐	☒
80%	☐	☒
50%	☐	☒
15% WALKING RATE	_____ fps	

PART 2

SATISFIED	YES	NO
	☒	☐

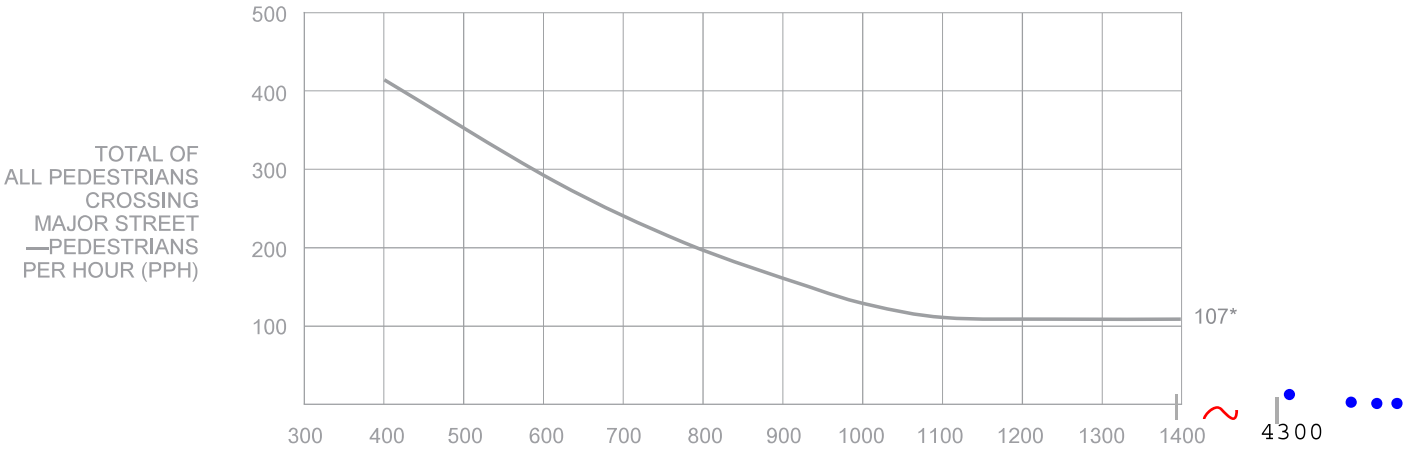
	YES	NO
AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	☒	☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street	☐	☐

Pedestrian Volume WARRANT 4 (continued)

✯ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ✯

SPEED ≤ 35 MPH

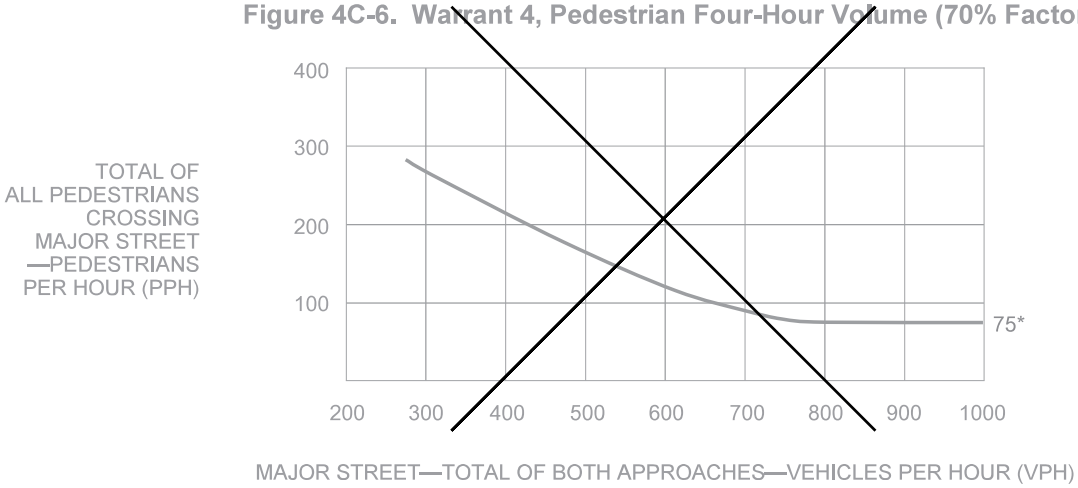
Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



** Note: 107 pph applies as the lower threshold volume*

SPEED > 35 MPH

Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)



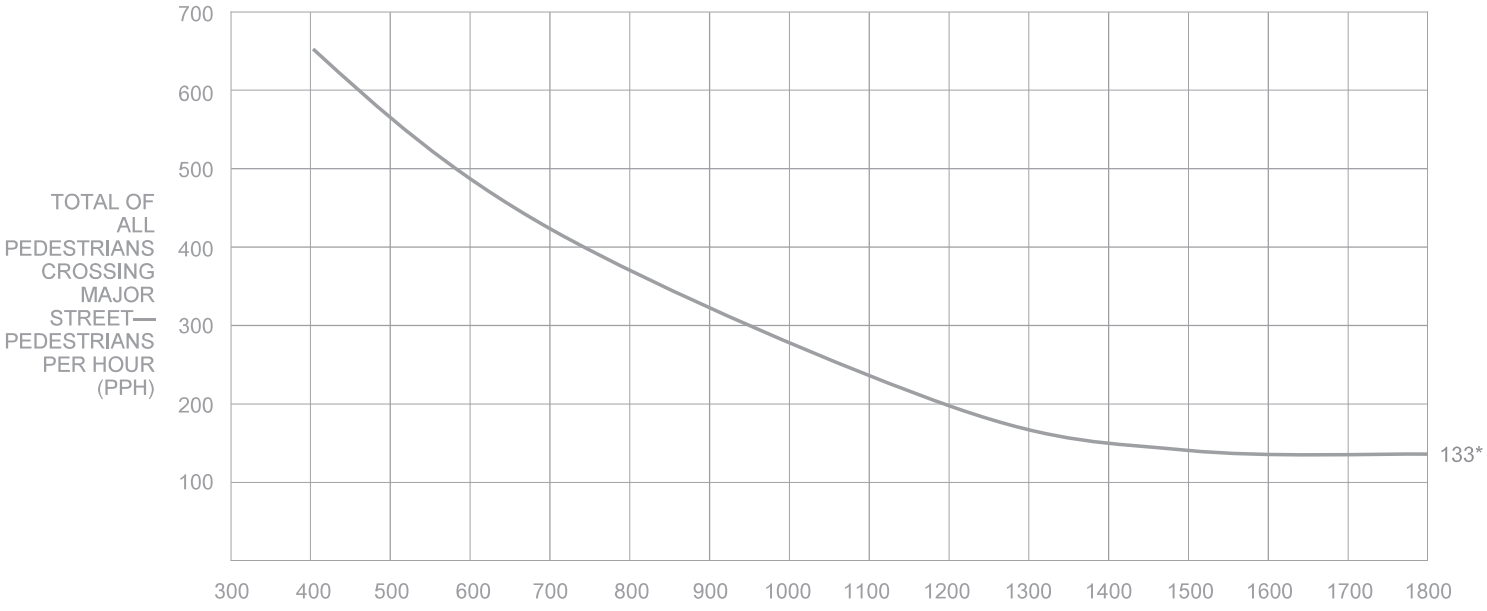
** Note: 75 pph applies as the lower threshold volume*

Pedestrian Volume WARRANT 4 (continued)

✯ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ✯

SPEED ≤ 35 MPH

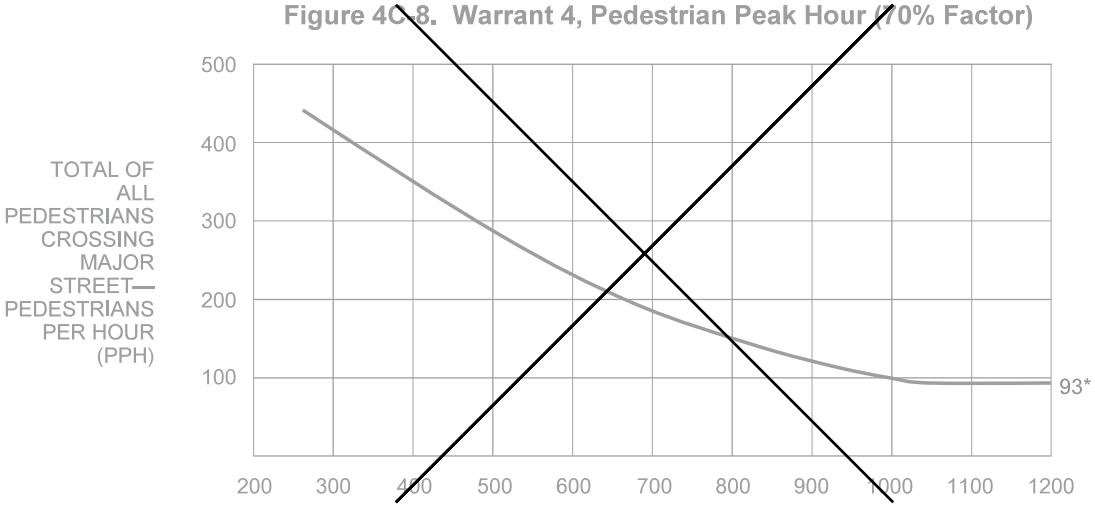
Figure 4C-7. Warrant 4, Pedestrian Peak Hour



** Note: 133 pph applies as the lower threshold volume*

SPEED > 35 MPH

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



** Note: 93 pph applies as the lower threshold volume*

School Crossing — WARRANT 5

N/A ☒

SATISFIED YES ☐ NO ☐

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. Part A and Part B shall be satisfied.
b. For purposes of this warrant, schoolchildren include elementary through high school students.
c. Estimated schoolchildren volumes may be used where a new school or expanded school has been approved for construction.
d. The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of schoolchildren at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the schoolchildren are using the crossing is less than the number of minutes in the same period and there are a minimum of 20 schoolchildren during the highest crossing hour.
e. The School Crossing signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of traffic.
f. Non-intersectional schoolchildren crosswalk locations may be signalized when justified.
g. Pedestrian Hybrid Beacons may be considered instead of a traffic signal if a device is recommended based upon pedestrian needs

PART A — SATISFIED YES ☐ NO ☐

Gap / Minutes and # of Children		Hour		YES	NO
Gaps vs Minutes	Minutes Children Using Crossing		Gaps < Minutes	☐	☐
	Number of Adequate Gaps		AND Children ≥ 20/hr	☐	☐
School Age Pedestrians Crossing Street / hr					
AND, Consideration has been given to less restrictive remedial measures				☐	☐

PART B — SATISFIED YES ☐ NO ☐

	YES	NO
The distance to the nearest traffic signal along the major street is greater than 300 ft	☐	☐
OR, The proposed traffic signal will not restrict progressive movement of traffic	☐	☐

Coordinated Signal System — WARRANT 6

N/A ☐

SATISFIED YES ☐ NO ☒

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. The Coordinated Signal System signal warrant should not be applied where the resultant spacing of traffic control signals would be less than 1,000 feet.
b. All Parts must be satisfied.

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	YES	NO
≥ 1000 ft	N 760 ft, S 740 ft, E _____ ft, W 950 ft	☐	☒
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		☐	☒
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.			

Crash Experience Warrant — WARRANT 7

N/A ☐
SATISFIED YES ☐
NO ☒

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. All Parts must be satisfied.
b. For locations that involve other agencies, crash data from other involved jurisdictions should be obtained.

			YES	NO
Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency			☐	☒
REQUIREMENTS	Number of crashes reported within a 12-month period susceptible to correction by a traffic signal: 2		☐	☒
5 OR MORE	*Indicate Date(s):* 1/2/2024, 2/20/2024			
REQUIREMENTS	**CONDITIONS**	✓		
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		☐	☒
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic			
	OR, Warrant 4, Pedestrian Volume Condition - Ped Vol ≥ 80% for ped volumes per Figures 4C-5 to 4C-8			

Roadway Network — WARRANT 8

N/A ☐
SATISFIED YES ☐
NO ☒

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. Existing traffic volumes with an ambient growth rate of 1% (or other LADOT approved ambient growth rate) may be used if projected volumes are not available.
b. All Parts must be satisfied.

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULLFILLED YES	FULLFILLED NO
1000 Veh / Hr	During Typical Weekday Peak Hour _____ Veh/Hr **AND** has 5-year projected traffic volumes that meet one or more of Warrants 1,2, and 3 during an average weekday.		☐	☒
	OR During Each of Any 5 Hrs. of a Saturday or Sunday _____ Veh / Hr			

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B	YES	NO
Highway System Serving as Principal Network for Through Traffic	X			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City	X			
Appears as Major Route on an Official Plan	X			
Any Major Route Characteristics Met, Both Streets			☐	☒

Intersection Near a Grade Crossing

WARRANT 9

N/A ☒

SATISFIED YES ☐

NO ☐

☆ *The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal* ☆

a. Both Parts A and B shall be satisfied.

b. This Warrant shall only be applied after review and approval by the LADOT Railroad Crossing and Safety Section (RCOSS), subject to CPUC General Order approval.

c. This Warrant does not apply for Pre-Signals and/or Queue-Cutter signals, as an alternative application of Pre-Signals (See 2012 CA MUTCD, Sec 8C.09). Pre-Signals shall only be applied after review and approval by RCOSS, subject to CPUC General Order approval.

	FULFILLED	
	YES	NO
PART A A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft	☐	☐
PART B **There is one minor street approach lane at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH **OR, There are two or more minor street approach lanes at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH	☐	☐

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C-10.

1. Number of Rail Traffic per Day _____ Adjustment factor from Table 4C-2 _____
2. Percentage of High-Occupancy Buses on Minor Street Approach _____ Adjustment factor from Table 4C-3 _____
3. Percentage of Tractor-Trailer Trucks on Minor Street Approach _____ Adjustment factor from Table 4C-4 _____

NOTE: If no data is available or known, then use AF = 1 (no adjustment)

Table 4C-2. Warrant 9, Adjustment Factor for Daily Frequency of Rail Traffic

Rail Traffic per Day	Adjustment Factor
1	0.67
2	0.91
3 to 5	1.00
6 to 8	1.18
9 to 11	1.25
12 or more	1.33

Table 4C-3. Warrant 9, Adjustment Factor for Percentage of High-Occupancy Buses

% of High-Occupancy Buses * on Minor-Street Approach	Adjustment Factor
0 %	1.00
2 %	1.09
4 %	1.19
6 % or more	1.32

* A high-occupancy bus is defined as a bus occupied by at least 20 people

Intersection Near a Grade Crossing WARRANT 9 (continued)

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal

**Table 4C-4. Warrant 9,
Adjustment Factor for Percentage of Tractor-Trailer Trucks**

% of Tractor-Trailer Trucks on Minor-Street Approach	Adjustment Factor	
	D less than 70 feet	D of 70 feet or more
0% to 2.5%	0.50	0.50
2.6% to 7.5%	0.75	0.75
7.6% to 12.5%	1.00	1.00
12.6% to 17.5%	2.30	1.15
17.6% to 22.5%	2.70	1.35
22.6% to 27.5%	3.28	1.64
More than 27.5%	4.18	2.09

**Figure 4C-9. Warrant 9, Intersection Near a Grade Crossing
(One Approach Lane at the Track Crossing)**

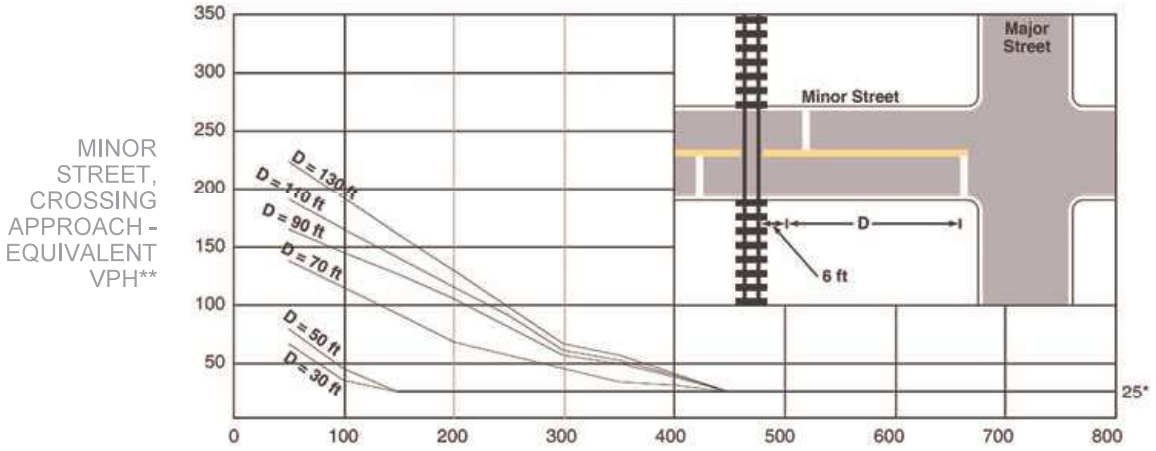
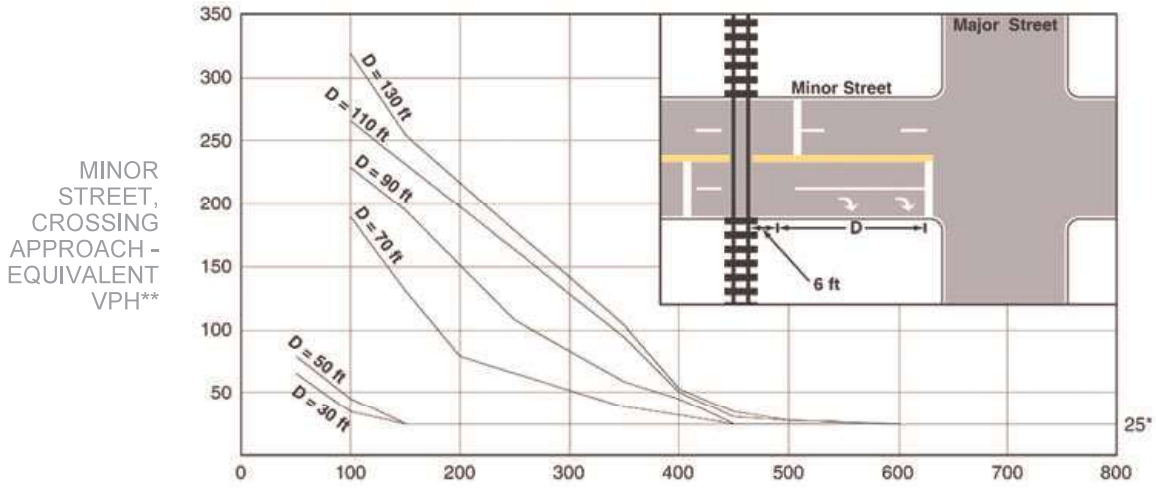


**Figure 4C-10. Warrant 9, Intersection Near a Grade Crossing
(Two or More Approach Lanes at the Track Crossing)**



** 25 vph applies as the lower threshold volume*
*** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate*

The next two warrants are not included in the MUTCD (CA) standard warrants, but are added as optional warrants that an engineer may use with discretion to justify a traffic signal for special conditions where other traffic control devices could be considered, but where a traffic signal might be more appropriate

Bicycles WARRANT 10

N/A	☐
SATISFIED YES	☐
NO	☒

** The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal **

a. Part A and Part B shall be satisfied
b. Per MUTCD (CA) Section 4C.01.15: "For signal warrant analysis, bicyclists may be counted as either vehicles or pedestrians."
c. When performing a signal warrant analysis, bicyclists riding in the street with other vehicular traffic are usually counted as vehicles, and bicyclists who are clearly using pedestrian facilities are usually counted as pedestrians; however for this bicycle specific warrant, bicyclists are counted as bicyclists, regardless of where they are riding.
d. Bicycle signal faces should be considered for use when this warrant is satisfied, with the final determination made during the signal design process. Refer to MUTCD (CA) Section 4D.104 (CA).
e. Estimated peak hour bicycle volumes may be used for new intersections, significantly reconstructed intersections, or where new bicycle facilities or near-term land development are proposed which will result in increased bicycle volumes.

PART A and B must be satisfied

SATISFIED	YES	NO
	☐	☒

PART A (*1 or 2 below must be satisfied*)

	SATISFIED YES	NO
1. Location meets the Department's guidelines for a marked crosswalk with Pedestrian Hybrid Beacons, where pedestrian units are replaced with bicyclists; **AND** the minor street is designated as part of the Neighborhood Enhanced Network in the Mobility Plan 2035 Element of the City's General Plan.	☐	☒
2. The intersection features a two-way bicycle or pedestrian path or trail within the median or alongside one of the roadways.	☐	☒

PART B (*1, 2, or 3 below must be satisfied*)

	SATISFIED YES	NO
1. Signal would be part of a corridor or area project to improve bicycle connectivity.*	☐	☐
2. Signal is associated with a development project.*	☐	☐
3. There have been at least 3 correctable collisions involving bicyclists in the last 1 year, 2 per year for the last 2 years, or 5 in the last 3 years of available data.	☐	☐

Specify dates of correctable bicycle collisions:

	Period Dates	Dates of Correctable Bicycle Collisions
1 year		
2 year		
3 year		

**The authority for a traffic signal justified using Part B.1 or B.2 shall be automatically rescinded three years after the date of approval if funding for construction of the traffic signal is not secured or project plans are not actively being reviewed for approval.*

Pedestrian Activated Yellow Flashing Beacons

WARRANT 11

N/A ☐
SATISFIED YES ☐
NO ☒

✯ The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal ✯

a. All Parts shall be satisfied.
b. This warrant should be applied when Pedestrian Activated Yellow Flashing Beacons are recommended within 600 feet BOTH upstream and downstream of existing traffic signals.

PART A	YES	NO
Location meets the guidelines for the installation of Pedestrian Activated Yellow Flashing Beacons as described in the LADOT Marked Crosswalk Guidelines.	☐	☒

PART B

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNALS	YES	NO
≤ 600 ft	N 760 ft, S 740 ft, E _____ ft, W 950 ft	☐	☒