



CITY OF POMONA COUNCIL REPORT

May 6, 2019

To: Honorable Mayor and Members of the City Council

From: Linda Lowry, City Manager

Submitted By: Rene Guerrero, Interim Public Works Director

SUBJECT: REPORT ON WARRANTS (UNIFORM STANDARDS AND SPECIFICATIONS) FOR LEFT TURN ARROWS, STOP SIGNS, AND TRAFFIC SIGNALS AND RECOMMENDATIONS FOR TRAFFIC CONTROLS AT INDIAN HILL/LINCOLN AVE. AND HUMANE WAY/ROSELAWN AVE.

RECOMMENDATION:

It is recommended that the City Council take the following actions:

- 1) Receive and file a report on warrants for left-turn arrows, stop signs and traffic signals;
- 2) Evaluate Staff findings and recommendations for Indian Hill and Lincoln Ave. left-turn arrow request; and
- 3) Evaluate Staff findings and recommendations for Humane Way and Roselawn Avenue traffic signal request.

EXECUTIVE SUMMARY: Annually, the Engineering Division receives several requests for the installation of various traffic control devices, including left-turn arrows, stop signs and traffic signals. Staff is providing a summary of the uniform standards and specifications adopted by the State of California, Department of Transportation for left-turn arrows, stop signs and traffic signals in California, as published in the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in accordance with the California Vehicle Code (CVC).

FISCAL IMPACT: It is anticipated that there will be a minor impact of less than \$1,000 for the recommended sign installations which can be funded within the existing Paint and Sign Operational Budget.

PREVIOUS RELATED ACTION: On May 2, 2016, City Council received and filed a report on warrants for left-turn arrows, stop signs, and traffic signals.

DISCUSSION: The use of uniform traffic control devices (messages, location, size, shapes, and colors) helps to reduce crashes and congestion, and improves the efficiency of the surface transportation system. Uniformity also helps reduce the cost of traffic control devices through standardization. The CA MUTCD is one of the key documents in the field of transportation engineering because it contains guidelines and warrants for the design and application of traffic control devices. For example, to determine if a traffic signal is warranted, an evaluation is performed utilizing nationally accepted warrants for traffic signals from both the State of California and Federal MUTCD. The Engineering Department receives and processes public requests to review and evaluate traffic-related concerns, and from time to time, Staff will receive a request to modify an existing traffic signal with left-turn arrows, install a stop sign(s), or install a new traffic signal. To the extent that CA MUTCD guidelines are adhered to as best practices, cities are able to experience less exposure to traffic accident related litigation.

Left-Turn Arrows

Requests for left-turn arrows have their own criteria for evaluation. As presented in the latest edition of the 2014 CA MUTCD, left-turn arrows should be considered when one or more of the following conditions exist:

- Collisions – 5 or more collisions for a particular left-turn movement during a recent 12-month period.
- Delay – 1 or more vehicles waiting at the beginning of the green interval and still remaining in the left turn lane after it turns red for at least 80% of the total number of cycles for one hour.
- Volume (traffic counts) – which is only applicable to new intersections where only estimated volumes are available.

Other factors to consider include whether there is a large percentage of buses and trucks that cross the intersection, and if there exists impaired-sight distance due to the curvature of the roadway.

Recent Request: Indian Hill Blvd. and Lincoln Ave. (all directions)

	Indian Hill and Lincoln	Minimum Requirement	Criteria Satisfied?
Number of left turn related collisions in a 12-month period	2	5	No
Delays (Data collected on Tuesday 2/21/19)	9%	80%	No

As shown in the table above, the criteria have not been met for left-turn arrows to be installed in any direction at the intersection of Indian Hill Blvd. and Lincoln Ave. As such, Staff does not recommend left-turn arrows at this intersection as it does not meet any of the criteria presented in the CA MUTCD.

Stop Signs

The City often receives inquiries about installing a stop sign at intersections as a way to reduce speeding in residential neighborhoods. Stop signs, however, are installed to regulate traffic flow and assign vehicle right-of-way. The installation of stop signs is not recommended for the

purpose of reducing vehicle speeds. The City uses the CA MUTCD criteria for installing a stop sign at intersections. Any of the following conditions may warrant a multi-way stop sign installation:

- When the total vehicular volume entering the intersection from all approaches averages at least 300 vehicles per hour for any eight-hour period of an average day, and the combined vehicular and pedestrian volume from the minor street averages at least 200 units per hour for the same eight hours.
- When five or more collisions of the type correctable by a multi-way stop installation occur within a 12-month period. Such collisions include right- and left-turn collisions, as well as right-angle collisions.

The City does not typically use stop signs at T-intersections in residential areas. The right-of-way at T-intersections is addressed in the California Vehicle Code, which requires that motorists on the T-leg yield to motorists on the through roadway. Stop signs are generally used on the minor leg of a T-intersection only if there is significant traffic volume on the through street.

There are many existing stop-controlled intersections throughout the City that may not appear to meet the current minimum requirements noted above. It may have been that when a particular subdivision or neighborhood was developed 30+ years ago, the criteria was different, such that it allowed for the stop sign installation. The criteria and requirements for the installation of stop signs have evolved over time.

Example:

Jefferson Ave. and Gibbs St.	Tuesday (03/01/16)	Minimum Requirement	Criteria Satisfied?
Average vehicles per hour for any 8 hours	19	300	No
Combined vehicular, pedestrian, and bicycle counts	19	200	No
Number of collisions in a 12-month period	0	5	No

Traffic Signals

Traffic signals are one of the most restrictive forms of traffic control that can be used at an intersection. In order to ensure that the use of traffic signals is limited to situations where they will be most effective, practitioners have developed a series of traffic signal warrants to define the minimum traffic conditions that should be present before a traffic signal is installed. The application of these traffic signal warrants can be complicated at times.

The public often views traffic signals as a cure-all for traffic problems at intersections. As a result, traffic signals have often been installed at intersections where less restrictive traffic control would have been more appropriate, effective, and economical. Traffic signal warrants have been developed to establish minimum criteria for evaluating the need for a traffic signal at a specific intersection. These warrants do not define the need for a traffic signal, but merely indicate where further study of a traffic signal installation is justified. When properly justified and installed, traffic signals can have many positive benefits. However, traffic signals also have negative impacts, particularly if the signal is improperly justified or installed.

When the installation of a traffic signal is properly justified, and the design, operation, and maintenance are in accordance with current principles, the signal can have many positive benefits on the efficiency and safety of vehicular and pedestrian traffic at the intersection. The advantages to a properly justified and installed traffic signal may include one or more of the following:

- It can provide for the orderly movement of traffic.
- It can increase the traffic-handling capacity of the intersection if proper physical layouts and control measures are used and the signal operational parameters are reviewed and updated on a regular basis to maximize the ability of the traffic control signal to satisfy current traffic demands.
- It can reduce the frequency of certain types of crashes, especially right-angle collisions.
- By coordinating the signal with adjacent signals, it can provide for continuous or nearly continuous movement of traffic at a definite speed along a given route under favorable conditions.
- It can be used to interrupt heavy traffic on the major street to permit vehicular and pedestrian traffic on the minor street to cross.

Disadvantages may result if a traffic signal is not properly justified or if the traffic signal is ill-designed, ineffectively placed, improperly operated, or poorly maintained. The disadvantages that may be associated with an improperly justified, installed, operated, or maintained traffic signal include:

- It can increase delay for all traffic movements.
- It can lead to an increase in traffic violations at the intersection.
- It can increase the frequency of traffic crashes at the intersection (primarily rear-end crashes).
- It can cause road users to increase the use of alternative routes to avoid the signal. Often, these alternative routes travel through neighborhoods or other less adequate roads.
- Installation of traffic signals is expensive and diverts funds from normal roadway maintenance

In deciding if a traffic signal will be an asset instead of a liability, traffic engineers evaluate nationally accepted warrants for traffic signals. When an inquiry for a traffic signal is made by the public, Staff will investigate and prepare a signal warrant analysis, including a review of traffic conditions, pedestrian characteristics, and physical characteristics of the intersection to determine whether installation or modification of a traffic signal is justified at a particular location. The investigation will include analysis of factors related to the existing operation, safety, potential to improve these conditions, and applicable factors contained in the traffic signal warrants.

The term "traffic signal warrants" refers to the list of established criteria used by traffic engineers to quantitatively justify or determine the potential need for the installation of a traffic signal at an intersection. The nine signal warrant criteria are presented in the latest edition of the 2014 CA MUTCD as follows:

- Warrant 1 – Eight-Hour Vehicular Volume
Is the vehicle volume on the main street so heavy that drivers on the side street will try to cross when it is not safe?

- **Warrant 2 – Four-Hour Vehicular Volume**
Is the volume of vehicles entering an intersection creating confusion or congestion?
- **Warrant 3 – Peak Hour**
Is the traffic condition at the intersection during the peak hour causing the minor street traffic to suffer undue delays in entering or crossing the major street?
- **Warrant 4 – Pedestrian Volume**
Is the number of pedestrians trying to cross a busy main street creating confusion, congestion or hazardous conditions?
- **Warrant 5 – School Crossing**
Does the number of school children crossing a street require special control for their protection? If so, is a traffic signal the best solution?
- **Warrant 6 – Coordinated Signal System**
Will the installation of a traffic signal allow for continuous, uniform traffic flow with a minimum number of vehicle stops?
- **Warrant 7 – Crash Experience**
Does the intersection's accident history indicate that a traffic signal will reduce the possibility of a collision?
- **Warrant 8 – Roadway Network**
Will the installation of the traffic signal negatively impact the traffic flow on the existing network?
- **Warrant 9 – Intersection Near a Grade Crossing**
Is the intersection too close to a railroad at-grade crossing?

Recent Request: Humane Way and Roselawn Ave.

Intersection	Traffic Signal Warrant	Warrant Satisfied	Signal Warranted
Humane Wy/ Roselawn Ave	Eight-Hour Vehicular Volume	No	Yes
	Four-Hour Vehicular Volume	Yes	
	Peak Hour	Yes	
	Pedestrian Volume	No	
	School Crossing	No	
	Coordinated Signal System	No	
	Crash Experience	No	
	Roadway Network	No	
	Intersection Near a Grade Crossing	No	

For this analysis, two of the nine warrants were satisfied which means a traffic signal is warranted. Staff concurs with the recommendation for a traffic signal as it will improve the overall operation and decrease delay to Roselawn Ave.. The cost to design and install a traffic signal at this location will be higher due to its unique topography. At this time, there are no funds available to start design. As an interim measure, MUTCD allows the installation of an all-way

stop control until a traffic signal is installed. As such, Staff recommends installing all-way stop control at Humane Way and Roselawn Ave.

ALTERNATIVE(S): The City Council has the following alternatives:

- 1) Reject Staff findings and recommendations for left-turn arrow request at Indian Hill Blvd. and Lincoln Ave. and provide Staff with further direction; and/or
- 2) Reject Staff recommendations to install all-way stop control at Humane Way and Roselawn Ave. as an interim measure and leave the intersection as is until funds become available to install a traffic signal.

Prepared by:

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