



Public Works Department

August 11, 2014

04-SM-84 26.72
0413-NUS2070

Amjad Naseer
District Branch Chief
Office of Permits
Caltrans District 4
111 Grand Avenue
P.O. Box 23660
Oakland, CA 94623-0660

Dear Mr. Naseer:

Reference is made to your letter dated November 19, 2013 providing comments on the City of Menlo Park's November 7, 2014 submittal for Encroachment Permit to install one red light enforcement camera system consisting of (3) poles, foundation, underground 2" and 3" cables to run power, Cat 5 cable, phasing communication wirings and camera enclosure and flashes on State Highway 04-SM-84, Post Mile 26.72, at Chilco Street, in the City of Menlo Park.

Transmitted herewith for your review and consideration are the following:

- 1) Traffic Engineering Study for the Proposed Automated Red Light Enforcement System for the Intersection of Bayfront Expressway with Chilco Street in accordance with Policy Directive 14-01, Effective February 5, 2014
- 2) Five sets of the revised plans addressing the Electrical Design comments.

If you have questions regarding our submittals, please contact me at 650-330-6770.

Sincerely,

Rene C. Baile, P.E.
Transportation Engineer

Traffic Engineering Study for the Proposed Automated Red Light Enforcement System for the Intersection of Bayfront Expressway with Chilco Street in Accordance with Policy Directive 14-01, Effective February 5, 2014 (Permit No. 0413-NUS2070)

- **Consideration of the original signal warrant (if available) that precipitated the installation of the signal as outlined in the California Manual on Uniform Traffic Control Devices Chapter 4C, Traffic Control Signal Needs Studies**

Caltrans performed the original signal warrant for the traffic signal of Bayfront Expressway with Chilco Street.

- **Signal Timing in general**

Caltrans implemented the signal phasing and signal timing for the traffic signal of Bayfront Expressway and Chilco Street in accordance with the CA-MUTCD.

- **Determination of Yellow Interval in accordance with CA MUTCD Section 4D.26**

For the intersection of Bayfront Expressway and Chilco Street, the yellow intervals were determined by Caltrans in accordance with CA MUTCD Section 4D.26.

- **Analysis of collision data and identification of collision patterns and the expected reductions in severe collisions that will be obtained through implementation of the ARLE system, using the latest scientific methods to quantify the expected changes in intersection safety performance.**

The following are the collision information for the intersection of Bayfront Expressway and Chilco Street for the three- year period from January 1, 2009 to December 31, 2011: 7 traffic collisions, 6 of which were injury collisions that resulted in 1 fatality and 9 injuries. The primary collision factors for the traffic collisions are broken down as follows: speeding for 5 collisions, unsafe turn for 1 collision, and 1 other violation for 1 collision.

As another sampling for analysis of collision data and identification of collision patterns at the intersection, we looked at the following traffic collisions that occurred at the intersection from 2012 to present:

Year	Number of Collisions	Number of Injuries	Primary Collision Factors
2012	9	4	Speeding for 5 collisions Unsafe turn for 2 collisions DUI for 1 collision Unsafe passing for 1 collision
2013	4	3	Speeding for 2 collisions

			Unsafe turn for 2 collisions
2014*	2	1	Unsafe Turn for 2 collisions

- Not full year

The Journal of Trauma study examined driver behavior for nine months at a dangerous intersection in a New Orleans suburb. The report concluded that red light cameras decreased the rate of red-light running and had a "lasting effect on driver behavior." Based on these findings, traffic collisions, in which speeding, unsafe turns, and unsafe passing were the primary factors could be potentially eliminated by red light cameras. For the five and a year collision record, that is 20 of 22 collisions or 85 percent of the abovementioned traffic collision data.

Traffic collisions pre-camera at red light camera enforced intersections in Menlo Park totaled 141 from 2003 to mid-year 2008 when the first camera went live. Collisions decreased post red light camera implementation totaling 103 from mid-year 2008 to June 30, 2013, a 26.4 percent reduction. The number of rear-end collisions occurring in Menlo Park's red light camera enforced intersections has increased and the number of side-impact (T-bone) collisions has decreased. Studies find the coupling of these trends results in an overall net reduction in accident severity, including fewer serious injuries.

- **Comparison of collision frequency and rates to other similar type intersection in the area.**

The intersection of Bayfront Expressway with Chrysler Drive, one intersection north of the intersection of Bayfront Expressway with Chilco Street, is a similar type intersection in the area. From 2009 to April, 2014, there have been 11 collisions in the intersection resulting 11 injuries.

For the same time period from 2009 to April, 2014, there have been 22 collisions in the intersection of Bayfront Expressway with Chilco Street, resulting in 1 fatality and 17 injuries.

- **Contacting parties familiar with the intersection, including law enforcement and maintenance personnel, and determine their observations and comments regarding the collisions**

Menlo Park Police staff had observed the following contributory factors that have been causes for the collisions experienced over the years at the intersection of Bayfront Expressway and Chilco Street, and the feeding arteries to this intersection:

- Red light running (Primary Factor)
- Speeding above the Posted Speed Limit (Primary Factor)
- Unsafe lane change or right of way violation

Test hang was conducted on March 11, 2013 for a 12-hour period and did demonstrate a significant red light violation problem as shown in the following results.

Video Survey Results (Bayfront Expressway at Chilco Street) ---12 Hour Period Only---						
Date	Cross Street	Approach	Left Turn	Through	Right Turn	Total
3/11/13	Chilco & Bayfront Expressway	NB	1	5	0	6
	Chilco & Bayfront Expressway	SB	0	2	90	92
	Chilco & Bayfront Expressway	EB	5	0	114	119

The NB approach had 6 red light runners, 5 of which were going straight or were through traffic. This could be explained by the fact that there are no other controlled intersections for the northbound direction between this intersection and the intersection at Willow Road. Consequently, motorists, at this segment of the Expressway, tend to drive at speeds higher than the posted speed limits and run the red light.

- **Evaluation of previous countermeasure(s) implemented to address collision or driver behavior patterns**

Previous strategies or countermeasures to address collision or driver behavior as described above include working radar/lidar at the location to enforce the speed limits as well as monitoring of the intersection for red light violations. Enforcing the speed limits help drivers to drive at the posted speed limit and potentially, for drivers to avoid finding themselves in a dilemma zone when approaching a signalized intersection at high speeds and the light turns yellow. The dilemma zone is the space from the intersection to the point on the road where it may be difficult for the driver to discern whether they should run the yellow or red light or brake to be safe.

- **Identification and evaluation of possible countermeasure(s) to address collision or driver behavior patterns**

One of the issues that Menlo Park Police staff has faced while working the intersection of Bayfront Expressway and Chilco Street is placement of patrol vehicles. There is no safe place on the Expressway to deploy a car for an extended period of time. Parking on Chilco Street does not allow for officers to have full observation of light changes on Bayfront Expressway. Consequently, Menlo Park Police staff has identified and evaluated the automated red light enforcement system as a safe, accurate and practical countermeasure to address driver behavior patterns and reduction of collisions at the intersection.

Evaluation of citations being issued at the intersection, specifically straight through movement on red, and left turn on red, where rights are prohibited on red

Due to the constraints mentioned in the previous bullet point regarding enforcement of red light violations, the City had issued very few citations on which to base an evaluation of incidents of red light running at the intersection. Consequently, a test hang was conducted on March 11, 2013 for a 12-hour period to determine red light violations at the intersection. The result of the test hang is shown above.