



DATE: August 6, 2012

TO: Mayor and Members of the City Council

VIA: James C. Hardy, City Manager

FROM: Ramon Towne, Director of Public Works
Leah Edwards, Assistant Engineer

SUBJECT: TRAFFIC CONTROL DEVICES ON EDGEWATER BOULEVARD AT
PORT ROYAL AVENUE (NORTH)

RECOMMENDATION

It is recommended that the City Council accept by motion and Minute Order the Traffic Review Committee's recommendation to install advance yield lines with corresponding signage on Edgewater Boulevard at the intersection with Port Royal Avenue (north).

EXECUTIVE SUMMARY

At the June 27, 2012 Traffic Review Committee (TRC) Meeting, the Committee reviewed, discussed and voted to proceed with the installation of additional traffic control devices on Edgewater Boulevard at the intersection with Port Royal Avenue (north). Yield lines would be painted on the street prior to the existing crosswalks and "Yield Here to Pedestrians" signs installed adjacent to the lines.

BACKGROUND

At the January 9, 2012 Special City Council Meeting, Council requested a review for the installation of stop signs at the intersection of Edgewater Boulevard and Port Royal Avenue (north). Staff had a Stop Sign Warrant Study performed by Republic ITS in February 2012 (see Attachment 1). The TRC reviewed and discussed the Stop Sign Warrant Study at the March 28, 2012 TRC meeting and accepted the results of the Study that stop signs are not warranted at this intersection. The TRC did, however, request that further review of the intersection be performed for improving pedestrian safety.

Staff conducted site visits and pedestrian counts and studied options for improving pedestrian safety at the marked uncontrolled crosswalk. Various options were identified and considered by the TRC at the June 27, 2012 meeting (see Attachment 2). Installing advance yield lines with corresponding signage on Edgewater Boulevard at the Port

Royal Avenue (north) crosswalk is the preferred and recommended next step in a progressive approach to improving pedestrian safety.

ANALYSIS

The TRC discussed various options and voted to proceed with installing yield lines and corresponding signage at the crosswalks on Edgewater Boulevard and Port Royal Avenue (north). Although this type of traffic control has been installed at other Bay Area locations, this would be the first installation of this type in Foster City. Public outreach regarding the traffic control measure will be done prior to installation.

Attachments: 1. Stop Warrant Study
2. June 27, 2012 Memo to Traffic Review Committee

cc: Subject
Chron



CA Lic: 647154
 3765 Yale Way
 Fremont, CA 94538
 (510) 440-8127 Phone
 (510) 440-1751 fax

Memo

To: Leah Edwards/Foster City

From: Steve Fitzsimons

Date: February 23, 2012

Re: Edgewater Boulevard and Port Royal
 (north) multi-way Stop warrant study

This memo summarizes the data collected and analysis completed for a Stop sign Warrant study at the Edgewater Boulevard and Port Royal (north) intersection in Foster City. The study consisted of a vehicle, pedestrian and traffic gap count under the guidelines of *Section 2B.07 Multiway Stop Applications* of the California Manual on Uniform Traffic Control Devices.

In summary, the warrant states that an all-way stop sign is warranted (provides a net operations benefit) if:

- A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right- and left turn collisions as well as right-angle collisions, OR:
- The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and the combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour

Crash History

City files indicate there have been a total of 4 correctible reported crashes at the study intersection in the last three years of available data. Two occurred in 2007 and two more in 2009. This represents a maximum of two crashes in a 12-month period. The available records were furnished from the State Wide Integrated Traffic Records System (SWITRS) for the period starting May 2007 and ending April 2010. Reported crashes are summarized in Table 1.

Conclusion: the crash history warrant is not satisfied.

**Table 1
Crash Records**

Date	Time	Collision Type	Veh 1 Movement	Veh 2 Movement	Primary Collision Factor	Within Intersection?	Correctible? ⁴
1/31/2007	8:17AM	Broadside	EB LT	WB Th	Improper turn	Yes	No
6/3/2007	11:30AM	Other	NB Th	NB RT	Other	No ²	No
10/20/2007	3:36 PM	Hit Object	NB Th	None	Inattention	No	No
11/10/2007	2:11 PM	Rear end	SB Th	SB Th	Unsafe Speed	Yes	Yes
11/13/2007	9:27 AM	Improper Turn	SB U	NB Th	Improper turn	Yes	Yes
4/29/2008	3:08 PM	Sideswipe	SB U	SB Th	Lane Change	No	No
6/22/2009	8:39 PM	Hit Object	NB LT	None	Unsafe Speed	Yes	No
7/11/2009	2:49 PM	Other	EB Backing	WB Stopped	Inattention	Yes	No
7/23/2009	8:00 AM	Hit Object	EB LT	NB Th	Inattention	Yes	Unknown ³
8/15/2009	11:41AM	Rear end	NB Th	NB Th	Unsafe Speed	Yes	Yes

Notes:

1. EB=Eastbound, NB=Northbound, SB=Southbound, WB=Westbound. Th=Through, RT=Right Turn, LT=Left Turn, U=U-turn.
2. Accident records are typically requested within the study intersection and within 200 feet of the study intersection.
3. The accident report shows the accident type as Hit Object but all other data in the report indicates it was a broadside collision. This report assumes the accident type was entered in error.
4. "Correctible?" means is it likely the accident would not have occurred if all-way stop control were in place.

Every reported crash occurred in daylight hours, and all but the 11/10/07 crash occurred when the pavement was dry. These observation suggest the reported crashes occurred because of operator error, not because of poor lighting or intersection design.

Traffic Volume Warrant

Traffic counts were collected by the firm Marks Traffic Data on Tuesday February 14 with 24-hour machine counters. The counts show a total of 6366 southbound vehicles and 5902 northbound vehicles on Edgewater Boulevard, and 564 westbound and 497 eastbound vehicles on Port Royal Avenue. Table 2 shows the data in the form needed for the warrant criterion.

To supplement this machine count data, manual peak hour (5-6 PM) counts and delay studies were collected on Tuesday February 21, 2012. During the observation period, the weather was sunny and warm.

The peak hour count collected February 21 showed 89 vehicles, 4 pedestrians and no bicycles on Port Royal Drive (sum of both directions). Side street delays were recorded in a range of 4 to 43 seconds, with an average delay of 12.1 seconds.

Conclusion: the volume warrant is not satisfied.

Table 2 Traffic Count Summary						
Start Time	Edgewater			Port Royal		
	NB	SB	Total Entering	EB	WB	Total Entering
12:00 AM	17	23	40	0	2	2
1:00 AM	5	18	23	0	1	1
2:00 AM	4	9	13	0	0	0
3:00 AM	5	5	10	0	0	0
4:00 AM	13	4	17	1	0	1
5:00 AM	79	11	90	6	6	12
6:00 AM	225	39	264	9	7	16
7:00 AM	709	174	883	32	26	58
8:00 AM	679	354	1033	66	36	102
9:00 AM	436	255	691	27	30	57
10:00 AM	363	229	592	22	30	52
11:00 AM	282	270	552	32	31	63
12:00 Noon	308	380	688	31	44	75
1:00 PM	307	337	644	36	30	66
2:00 PM	422	384	806	37	50	87
3:00 PM	324	536	860	36	49	85
4:00 PM	377	561	938	28	47	75
5:00 PM	408	762	**1170	39	66	105
6:00 PM	385	733	1118	26	34	60
7:00 PM	233	505	738	32	22	54
8:00 PM	138	326	464	22	28	50
9:00 PM	94	233	327	8	20	28
10:00 PM	59	149	208	4	3	7
11:00 PM	30	69	99	3	2	5
TOTAL	5902	6366	12268	497	564	1061
Notes: ** = Peak hour Yellow highlighting indicates the 8 highest volumes of the day.						

Other Factors

Other factors may be considered in a Warrant Study, including

A. The need to control left-turn conflicts;

- B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;
- C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and
- D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

It is evident from the field observations that A and B are not relevant at this intersection.

Sight distance was carefully reviewed and also appears not relevant. Ample corner sight distance is available in the northwest and southwest corners (pictured on the left side in the photo below). Adequate sight distance is available in the northeast corner. Sight distance in the southwest corner is more limited than the other four corners. However, as shown in the photo below, a northbound driver on Edgewater Drive has adequate sight distance of westbound drivers. Based on field observations, westbound drivers were all observed to edge forward past the limit line before proceeding. The crash data also indicate this sight distance is not an issue.



Photo 1

Looking north along Edgewater Boulevard at Port Royal Avenue
Source of photo – Google Earth

The Edgewater & Port Royal intersection is not an intersection of two collector streets so item D also is not relevant.

Conclusion: other factors do not justify installation of the all-way Stop control.

Finding

The all-way stop control is not warranted.

This report was prepared by a Registered Civil Engineer



A handwritten signature in black ink that reads "Steve Fitzsimons". The signature is written in a cursive, flowing style.

By: Steve Fitzsimons Date: 2/23/12

MEMORANDUM

To: Traffic Review Committee Members

From: Leah Edwards, Assistant Civil Engineer *LE*

Date: June 27, 2012

Subject: Crosswalk Options on Edgewater Boulevard at Port Royal Avenue
(Item No. 1 --- Action)

RECOMMENDATION

It is recommended that the Traffic Review Committee (TRC) continue with a progressive approach to traffic calming by adding Advance Yield Lines and corresponding signage at the crosswalk on Edgewater Boulevard at Port Royal Avenue (north).

SUMMARY

The TRC reviewed and discussed the Edgewater Boulevard and Port Royal Avenue stop sign warrant study at the March 28, 2012 meeting. Based on the study, stop signs are not warranted, and the TRC requested further review of the intersection. Staff conducted site visits and pedestrian counts and studied options for improving pedestrian safety at the marked uncontrolled crosswalk. Installing advance yield lines and corresponding signage on Edgewater Boulevard at the Port Royal Avenue (north) crosswalk is recommended as the next step in a progressive approach to traffic calming.

BACKGROUND/ANALYSIS

The posted speed limit along this section of Edgewater Boulevard is 35 mph. There are marked crosswalks across Edgewater Boulevard both north and south of Port Royal Avenue (north). In past years, the TRC has reviewed this intersection and voted to implement improvement measures. Both crosswalks were striped to increase visibility. In 2004, all pedestrian advance and pedestrian crosswalk signs for northbound and southbound traffic at this intersection were changed to high visibility florescent signage.

To increase nighttime visibility, the power of the streetlights adjacent to the intersection was increased from 150 watts to 200 watts. In 2006, two "State Law - Yield to Pedestrians" signs were installed in the crosswalks on Edgewater Boulevard at Port Royal Avenue (north).

In March 2012, the TRC reviewed a stop sign warrant study conducted for the intersection of Edgewater Boulevard/Port Royal Avenue (north). The study showed that stop signs were not warranted, however the TRC decided to further study the intersection for additional improvements.

As part of the stop sign warrant study, 4 pedestrians were counted during the peak hour traffic (5-6pm). During April and May, Staff performed additional hourly pedestrian counts at the intersection. Pedestrians were counted on weekdays, between 7am and 5pm. On a typical weekday, 7am-5pm, an average of 6.5 pedestrians per hour (pph) crossed Edgewater Boulevard at Port Royal Avenue (north). The highest volume was 19 pph during one of thirty total hours counted. This occurred on a Thursday, between 3 and 4pm.

The following is a list of options for the crosswalk on Edgewater Boulevard at Port Royal Avenue (north):

1. Remove Crosswalk

Removing the crosswalk and signage on Edgewater Boulevard at Port Royal Avenue (north) would eliminate the false sense of security pedestrians may have when crossing at an uncontrolled intersection. This option is relatively inexpensive, and reduces maintenance costs at the intersection. However, pedestrians may still cross legally at this location, but it would be done with less driver awareness. Therefore removing the crosswalk is not recommended.

2. No action

Take no action, and leave the intersection as is.

3. Advance Yield Line

Advance yield lines encourage drivers to stop further back from the crosswalk, promoting better visibility between pedestrians and motorists. Yield lines (triangles) are painted prior to the crosswalk and "Yield Here to Pedestrians" signs point to the lines. These are markings and signs included in the most recent Manual on Uniform Traffic Control Devices (MUTCD). Costs include purchasing and installing the signs, painting the roadway and maintaining both. City crews would be able to do the work.

Adding yield lines could improve driver awareness of pedestrians at the intersection with minimal disruption to vehicular traffic on Edgewater Boulevard. Staff recommends proceeding with this option.

4. Pedestrian hybrid beacon

A pedestrian hybrid beacon is used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk. The lights are activated with pedestrian push buttons on either side of the intersection, so there is minimal disruption to vehicular traffic. The pedestrian volume at the intersection does not meet the 20pph lower threshold recommended in the MUTCD. The cost of equipment and installation is approximately \$15,000 plus ongoing maintenance costs. Staff does not recommend pursuing Option 4 at this time.

5. In-roadway lights

In-roadway lights would be installed at one of the crosswalks, and the second crosswalk eliminated. The lights are activated with pedestrian push buttons on either side of the intersection, so there is minimum disruption to vehicular traffic. The cost varies from \$20,000 – \$30,000, and ongoing maintenance costs tend to be high. The MUTCD recommends at least 40 pedestrians crossing during each of any two hours of a day before installing this device. The pedestrian count at the intersection does not meet this guideline. Due to the low number of pedestrians and the high costs, in-roadway lights are not recommended.

6. Stop signs

Stop signs on Edgewater Boulevard at Port Royal Avenue (north) are not warranted (see Item 1 from March 28, 2012 TRC Meeting). Installing stop signs would disrupt and delay the high volume of vehicular traffic on Edgewater Boulevard, which is a major arterial designed to move traffic through the city. There is a signalized intersection 800 feet north of the study intersection on Edgewater Boulevard at Beach Park Boulevard. Under normal conditions, it is unlikely that stop signs at Port Royal Avenue (north) would affect the signalized intersection of Edgewater Boulevard and Beach Park Boulevard. However, during peak traffic periods, a stop sign at Port Royal Avenue (north) could back up traffic to the signalized intersection, affecting signal operations. The highest volume of southbound traffic travels on Edgewater Boulevard at Port Royal Avenue (north) during the evening commute, 5-6pm. The cost of installing stop signs is relatively minor and work could be performed by City crews. However, since stop signs are unwarranted, this option is not recommended.

Based on pedestrian and vehicle counts, collisions, MUTCD guidelines, and costs, along with our policy of a progressive approach to traffic calming, Staff recommends pursuing Option 3, Advance Yield Lines and signage, at this time.