

## MEMORANDUM

Date: April 16, 2010

To: Kate Breen

From: Jack Fleck

Re: Bike Collisions at Market Street and Octavia Boulevard

Octavia Boulevard opened to traffic on September 9, 2005, replacing the elevated portion of the Central Freeway (US-101) north of Market Street. Since that time, at least 25 bicyclists have been hit by cars at Market Street at Octavia Boulevard.

The Octavia Boulevard design includes a prohibition of right turns from eastbound Market Street onto the entrance to the Central Freeway at Octavia Boulevard. Consequently, the original design included standard traffic control devices to convey the No Right Turn regulation to motorists in accordance with applicable engineering standards. These included a NO RIGHT TURN (symbol) sign on the signal mast-arm, and a NO TURN pavement message in the right-most, eastbound traffic lane.

After the opening of Octavia Boulevard, SFMTA engineers observed that a majority of motorists complied with the No Right Turn regulation at the subject intersection, but a sizable minority began to violate it. Table 1 shows the number of illegal right turns observed by SFMTA staff during periodic traffic counts performed between September 2005 and October 2006.

<b>TABLE 1</b>		
<b>Date</b>	<b>Time of Counts</b>	<b>Illegal Right Turns</b>
Sept. 28, 2005	7a-8a	33
Jan. 24, 2006	7a-8a	30
Jan. 24, 2006	4p-5p	8
Jan. 25, 2006	7a-8a	36
Jan. 25, 2006	4p-5p	16
Oct. 26, 2006	8a-9a	19

Based on these observations SFMTA engineers installed the following additional traffic engineering measures at the subject intersection to reinforce the no right turn regulation:

a) Additional "No Right Turn" signs facing eastbound traffic were installed in April and June of 2006.

- b) Straight (vertical) green traffic-signal arrows facing eastbound traffic to emphasize that turns are not allowed was installed around March 2006;
- c) Additional “No Turn” pavement messages were painted around March 2006;
- d) Painted white traffic island was installed on May 11, 2006 and safe-hit posts were installed on January 26, 2007, along the eastbound approach, between the right-most vehicular traffic lane and the bicycle lane (safe-hit posts are flexible plastic posts that are designed to delineate traffic, but will deflect and return to an upright position when hit by a vehicle);
- e) Larger guide signs at, in advance of, and past the subject intersection indicating alternative routes to the freeway were installed on February 12, 2007; and
- f) A “Watch For Bicycles” (symbol) warning sign in advance of the intersection was installed on February 13, 2007;
- g) Replacement of the painted traffic island with a raised concrete traffic island, installation of object markers atop the new island, installation of new safe-hit posts and striping approaching the new island, and adjustment of the lane extension markings through the intersection were installed on December 14, 2007.

Table 2 includes the number of illegal right turns observed by SFMTA staff during traffic counts performed in February 2007 and May 2007, after installation of the improvements (except for the raised median island).

<b>TABLE 2</b>		
<b>Date</b>	<b>Time of Counts</b>	<b>Illegal Right Turns</b>
February 9, 2007	8a-9a	3
May 1, 2007	7a-8a	1
May 1, 2007	8a-9a	0
May 1, 2007	4p-5p	2
May 1, 2007	5p-6p	0
May 2, 2007	4p-5p	0
May 2, 2007	5p-6p	0
May 9, 2007	7a-8a	5
May 9, 2007	8a-9a	1

SFMTA engineers have observed a greater than 93% decrease in the average number of illegal right turns per hour at the subject intersection since the installation of the improvements. Specifically, during the AM peak hours of 7:00 – 9:00 a.m., when the majority of illegal right-turns were observed, a comparison of Tables 1 and 2 shows that there was an average of 29.5 illegal right turns per hour during the 17-month period before the installation of the improvements (except for the raised median island) (September 2005 – January 2007), but an average of only two illegal right turns per hour during the four-month period after the installation (February 2007 – May 2007). These results are further reinforced by traffic count data collected from 7:00 a.m. to 9:00 a.m. on January 15 and 16, 2008, when SFMTA staff observed a total of one and zero illegal right turns, respectively.

Despite the decrease in the number of motorists illegally turning right onto the Central Freeway after installation of the improvements, during the same time period the number of collisions between bicycles and illegally right-turning vehicles has actually increased. In the 17 months between September 2005 when the on/off ramp opened and January 2007 when the traffic island, safe hit posts and additional freeway signs were installed, there were five collisions at the intersection of Market Street and Octavia Boulevard involving a bicyclist and an illegally right turning vehicle which were reported by the San Francisco Police Department to the California Highway Patrol, and recorded in the Statewide Integrated Traffic Record System, a rate of .3 per month. In the 11 months between February 2007 and December 2007 (when the raised concrete island was installed), there were six such collisions, an increase to .6 per month. Between December 2007 and July 31, 2008 (after the raised concrete island was installed to now) there were four such collisions, maintaining the rate of .6 per month. It is also important to note that no other intersection in San Francisco had more than six reported bicycle collisions from September, 2005 to December, 2006 with the exception of Fell Street and Masonic Avenue which had eleven collisions and has subsequently had major improvements.

Thus, SFMTA efforts to reinforce the No Right Turn regulation at Market and Octavia have succeeded in significantly reducing the incidence of illegal right turns, but have **not** reduced the rate of bicycle-involved collisions.

One additional step that SFMTA implemented to improve the safety of this intersection was the installation of an additional warning sign for bicyclists, which was approved by the California Traffic Control Devices Committee at its meeting on January 31, 2008. The sign was installed in April of 2008. Since its installation there have been two bicycle injury collisions caused by illegal right turns (0.5 per month), it is too early to determine if this measure has successfully reduced the incidence of bicycle collisions.

Note: This report was written in October of 2008. In 2009, there were six bicycle collisions at Market/Octavia, so the pattern of high collisions has continued.