SFMTA
Municipal Transportation Agency

November 20, 2012

Bill Wycko
San Francisco Planning Department
30 Van Ness Avenue
San Francisco, CA 94102

RE: Left Turn Treatment at Brighton Street and Ocean Avenue
Balboa Park Station Area Plan Transportation Study
Case #2004.1059E

Dear Mr. Wycko

SFMTA Sustainable Streets has reviewed the traffic mitigation proposed in the Balboa Park Station Area Plan Final EIR (Case No. 2004.1059E) regarding the intersection of Brighton Avenue and Ocean Avenue and determined that a protected left turn phase from westbound Ocean Avenue onto southbound Brighton Avenue is neither feasible nor acceptable to SFMTA.

The primary concern is the delays such a signal change would impose on the Muni K Line, a light rail vehicle (LRV) line which operates on Ocean Avenue. Given the current roadway geometry there is no way to provide a separate left turn pocket for the westbound left turn without widening the roadway and relocating the tracks so they would be 12 feet further apart. That mitigation was not proposed so left turns are made from the track lane. SFMTA rejection of the protected left turn phase treatment stems from problems associated with protected left turns made from a lane shared by both rail traffic and through/left-turn vehicle traffic. The following describes problems associated with the three types of protected signal phasing.

1. **Leading Left Turn Phase** – Because there are no exclusive left turn lanes at this intersection only one direction can have a protected left turn phase, which would be westbound for this intersection. If a leading left turn phase were to be provided, then there will be less time allocated for the opposing (eastbound) transit and through and left turn traffic. As a consequence, more vehicles would queue in the eastbound track lane; any left turning cars that did not clear the intersection would remain in the track lane and Muni inbound service would be directly impacted; outbound would also be affected as the LRVs must reach the end of the line before returning westbound. In addition, because of the eastbound traffic demand, only a small percentage of time can be provided to the left turn movement. Therefore only the first four or five vehicles would clear the intersection before the left turn phase terminated. Any other vehicles in the queue wanting to turn left will be making a permissive left turn against an

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eastbound traffic stream that is more densely packed as a consequence of having to wait for the westbound left turn phase to end. It is likely that the K Line would be stuck behind left turning traffic for multiple signal cycles in both directions. A second impact would be that westbound through traffic would experience more delay as more cars maneuvered around the backed-up track lane into the curb lane – the increased lane changes and usage of the curb lane would cause that lane to queue as well.

2. **Lagging Westbound Left Turn Phase** - If a lagging left-turn phase were to be implemented, the impact on the K Line would be less than the leading left-turn phase, but still cause delay for the K-Line primarily in the eastbound direction. In addition, incorporating a lagging left turn phase requires that the opposing (eastbound) left turn movement be prohibited in order to avoid a left-turn trap for eastbound traffic. The trap is created when the opposing direction (eastbound) making a left turn movement at the end of their green phase does not know that the westbound left turning vehicles had just received a green arrow. Prohibition of an eastbound left turn is contrary to the intent of the development.

3. **Split phase operation** – while neither considered in the EIR nor analyzed below, it is discussed here for completeness. Split phase operation occurs when only one direction of traffic goes at a time – first eastbound, then westbound. Split phase operation has its uses in limited circumstances – for example, at intersections with heavy turn movement volumes and modest to light pedestrian volume. Such operation would result in increased delay for all traffic (LRV, pedestrians and vehicles) at this intersection and disrupt east/west coordination for Muni and vehicle traffic. Intersection delay would increase. SFMTA would not support split phase operation at this intersection.

2012 Analysis

SFMTA staff used Synchro 8 to analyze Level of Service and delays associated with the existing phasing, leading left turn phasing and lagging westbound left turn phasing using data from the Balboa Park Traffic Study. The results are shown below in Table 1. Given the current lane configuration, the existing two phase operation results in less delay for the intersection and eastbound traffic turning traffic than the protected phase operation. Westbound traffic faces dismal delays under all three scenarios.

TABLE 1: STUDY DATA (2006), HCM 2000

Signal Phasing	Level of Service and Delay (seconds)		
	Intersection	EB	WB
Existing (2 phase)	F (121)	C (28)	F (217)
Leading LT	F (127)	D (45)	F (216)
Lagging WBLT*	F (128)	E (72)	F (194)

* eastbound left turn prohibited

SFMTA staff was perplexed by the delays calculated by Synchro for this intersection. Traffic Engineering would have received numerous complaints from the public and Muni if the intersection was experiencing this much delay. A PM Peak traffic count was conducted on 11/7/2012. The traffic volumes were about 20% less than those used in the Balboa Park transportation study (see study figure 9: EXISTING PLUS KRAGEN TRAFFIC VOLUMES). The new data was put into SFMTA's Synchro model, and the results are shown in Table 2 below. The intersection Level of Service and delay are consistent with field observation, and the existing two phase operation still shows less delay than does the leading left turn phase operation. While lagging left turn phase overall intersection operation has overall lower intersection delay, it requires prohibition of eastbound left turns (which will need to occur somewhere else), and comes at a slight increase in delay to eastbound transit and traffic when compared to existing two-phase operation.

TABLE 2: CURRENT TRAFFIC DATA (11/7/2012), HCM 2000

Signal Phasing	Level of Service and Delay (seconds)		
	Intersection	EB	WB
Existing (2 phase)	D (36)	C (20)	D (52)
Leading LT	D (41)	C (24)	E (58)
Lagging WBLT*	C (32)	C (25)	D (39)

* eastbound left turn prohibited

If you have further questions about this matter please contact Brian Dusseault of my staff at (415) 701-4676.

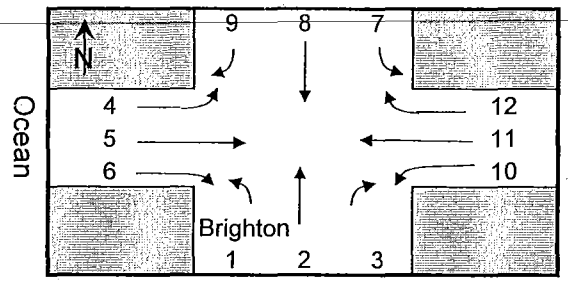
Sincerely,

Ricardo Olea
City Traffic Engineer

cc: Brian Dusseault, Al Herce, Scott Broady, Jerry Robbins – SFMTA
Robin Reitzes – Deputy City Attorney
Scott Sanchez – City Planning

ATTACHMENT: Ocean and Brighton PM Peak Traffic Count (11/7/2012)

City and County of San Francisco
SF Municipal Transportation Agency



Location: Ocean **at** Brighton

Date: November 7, 2012 **Day:** Wed **Weather:** Cloudy

Observers: Scott Broady / Jeff Tom **Time:** 4:40pm-5:40pm

Remarks: *Bold numbers=cumul count data*

TIME	Ocean Eastb'd			Ocean Westb'd			Brighton Northb'd			Brighton Southb'd		
	4	5	6	10	11	12	1	2	3	9	8	7
	→	→	→	←	←	←	↰	↑	↱	↓	↓	↓
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	12	*197*	*2*	*40*	*185*	*14*	*5*	*3*	*10*	*1*	*0*	*0*
4:45 PM	**12**	**197**	**2**	**40**	**185**	**14**	**5**	**3**	**10**	**1**	**0**	**0**
	11	*212*	*5*	*24*	*225*	*14*	*3*	*2*	*13*	*0*	*0*	*1*
5:00 PM	**23**	**409**	**7**	**64**	**410**	**28**	**8**	**5**	**23**	**1**	**0**	**1**
	5	*227*	*4*	*36*	*221*	*12*	*3*	*1*	*18*	*3*	*0*	*0*
5:15 PM	**28**	**636**	**11**	**100**	**631**	**40**	**11**	**6**	**41**	**4**	**0**	**1**
	11	*199*	*5*	*39*	*233*	*13*	*1*	*0*	*14*	*0*	*0*	*3*
5:30 PM	**39**	**835**	**16**	**139**	**864**	**53**	**12**	**6**	**55**	**4**	**0**	**4**
Highest 15 min	*12*	*227*	*5*	*40*	*225*	*14*	*5*	*3*	*18*	*3*	*0*	*3*
High 15m x 4	*48*	*908*	*20*	*160*	*900*	*56*	*20*	*12*	*72*	*12*	*0*	*12*