



OCCUPATIONAL & ENVIRONMENTAL HEALTH

14 October, 2005

Tilly Chang
Manager of Planning
San Francisco County Transportation Authority
100 Van Ness Avenue 25th Floor
San Francisco California 94102

Re: Comments on Folsom Street SAR

Dear Tilly:

Thank you for forwarding the Folsom Street SAR for our review. I appreciate the opportunity to provide the SFCTA the Department of Public Health's input into this evaluation. My comments on the SAR are listed below

1. The Pros and Cons of Conversion to Two-Way Operations related to human and environmental health (Table 3. Page 10) may benefit from the following additional information.

- Evidence indicates that on average lane reductions result in 11% net reductions in vehicle trips on a route and on alternate routes. (See comment below) This suggests that some scenarios (involving net reductions in the number of lanes) would be beneficial to congestion as well as total VMT.
- The table notes that improved pedestrian safety results from reductions in speed and reductions in VMT. More specifically, the probability of serious injury in a collision increases rapidly triples from 20 mph to 30 mph.¹ Ninety percent of pedestrians struck at speeds greater than 30 mph suffer severe injuries. Broadly speaking, each 1mph reduction in speed may reduce accident frequency by 5% with effects greatest for urban main roads and low speed residential roads.² A meta-analysis of traffic calming interventions demonstrated a 15% average reduction in the

¹ New directions in Speed Management: a review of policy.

² Taylor M, Lynam D, Barua A The effects of drivers speed on the frequency of road accidents. Transport Research Laboratory. TRL Report 421 Crowthorne, UK, 2000.

frequency of accidents.³ A 10% reduction in vehicle mileage might provide a 10-14% reduction in crashes.⁴

- Significant safety improvements may also result from increased lateral separation accompanying pedestrian facility improvements, from reduced potential conflict sequences at intersections with two-way circulation, and finally from increased pedestrian activity itself.
- Increased physical activity is an important indirect public health benefit of increased pedestrian activity.
- Increased community and social cohesion is an indirect social and public health benefit from increased pedestrian activity.
- Reduced noise is identified as a benefit to pedestrians. Reduced noise should be identified as a more general community benefit for residents, business owners, and walkers. Reduced noise is due to reduced speed and VMT as well as changes in vehicle type. Noise levels in SOMA are significantly above WHO guidelines for community noise.
- The table identifies low-speeds and stop-and-go traffic as two factors potentially contributing to air emissions. The relationship traffic speed–vehicle emissions relationship is U-Shaped and not linear. Emissions per mile generally fall with speed to about 30 miles per hour, then emissions per mile increase with speed. Particulate matter and Nitrogen oxide emissions increase with increasing speed above 30-40 mph. Carbon dioxide emissions are proportional to fuel consumption, also increasing above a threshold of about 30-40 mph. Effects on air emission will thus be dependent on weighted average changes in speed as well as changes in overall VMT and vehicle type. Any speed reductions down to 30mph would be beneficial to air emissions. Given the evidence on trip reductions following lane reductions, VMT related air emission reductions could be significant in some scenarios. Furthermore, potential mode shifts to transit, bicycling and walking, for local trips will have benefits on air quality.

2. Given our diverse transportation objectives and the current context of rezoning and residential development in the area, the SAR should document how the SFCTA CHAMP models dynamic changes in transportation demand secondary to land use changes in land uses and changes in the level of service related to each transport mode.

Reductions in road space can lead to changes in the route of a journey, changes in the time at which trips are made, changes in the means of travel, changes in the frequency of travel, changes in the destination of travel, trip elimination, and consolidation of trips to serve several destinations on one journey.⁵

Evidence suggests that lane reductions can reduce traffic volume. For example, Sally Cairns and her colleagues reviewed over 70 case studies where roadway lanes were reduced (e.g., lane reductions, temporary closures). In these cases, available data allowed for a “before and after” analysis of vehicle

³ Morrison DS, Petticrew M, Thomson H. What are the most effective ways of improving population health through transport interventions? Evidence from systematic reviews. *Journal of Epidemiology and Community Health* 2003;57:327-333.

⁴ Litman, T. *If Health Matters: Integrating Public Health Objectives in Transportation Planning*. Victoria Transportation Policy Institute. 2004.

⁵ Hunt, 2002

flow. Overall, reduction in roadway capacity led to reduced traffic volumes as measured on the affected roadway as well as on alternative routes (mean reduction -21.9%; median reduction -10.6%).⁶ Data from more recent changes (e.g. Portero Street) may provide local data on this effect. According to the SAR, the CHAMP model evaluates changes in auto traffic and transit due to changes in street configuration and transit service. ***How does the CHAMP model take into account the potential dynamic changes in vehicle trips resulting from changes in automobile level of service, for example, where reduced motor vehicle capacity may encourage people to shift to other transport times, routes or travel mode?***

Similarly, one-way to two-way conversion will simultaneously make changes to environmental conditions for all transportation modes. Pedestrian and bicycle facility improvements may decrease vehicle mode share. ***More generally, how does the CHAMP model or the TA take into account changes in the time, frequency, and mode of trips resulting from independent changes in the level of service of each mode?***

If the CHAMP model does not account for these effects, how might the TA adjust model results to take such modal shift effects into account?

3. The SAR and subsequent analysis of a two way conversion presents will need to balance the needs of commercial trucks with other multimodal transport objectives.

One issue that may require more attention in the SAR or future planning studies is the ongoing expected commercial needs for truck parking and deliveries for commercial businesses. Some degree of residual conflicts will remain in any multi-modal plan; however, a conversion needs to seek a balance between the needs of businesses and the recognition that trucks, double parking, and deliveries, create potential conflicts with the needs of pedestrians and bicyclists. Time restrictions or size restriction of delivery vehicles may be a feasible policy options. Speed controls may also limit potential adverse impacts of these conflicts.

4. The SAR and subsequent analysis of a two way conversion presents opportunities to apply quantitative health impact analytic methods to the evaluation of transportation planning

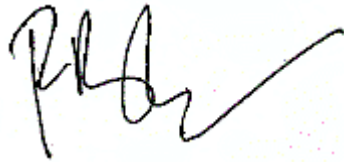
SFDPH is working with other professionals nationally to develop analytic methods to quantify and qualify environmental and human health impacts of the transportation system changes. SFDPH is in a position now to supplement forecasting methods used in transportation planning with health impact methods and measures. These methods currently allow some degree of quantification of how changes in transportation affect injuries, physical activity, and respiratory disease. Such health outcome measures can be modeled based on changes in VMT, speed, and indexes of neighborhood “walkability. Given that Public Health

⁶ Cairns, 2002

and Safety and Healthy Environment are two of the six Countywide Transportation Plan Goals, we would welcome the opportunity to contribute to a more robust project analysis using analytic health impact assessment methods.

Please feel free to contact me with any question on our comments at 252-3982.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rajiv Bhatia', with a long horizontal stroke extending to the right.

Rajiv Bhatia, MD, MPH
Medical Director, Occupational & Environmental Health

CC: Jose Luis Moscovich
Peter Cohen
Chris Daly
Tom Radulovich
Leah Shahum