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## *Memorandum*

TO: RBWG and RPC

DATE: February 14, 2008

FR: Sean Co

W. I.

RE: Evaluation of Regional Bicycle and Pedestrian Program (RBPP)

### **Background**

As part of the Transportation 2035 project assessment process, MTC will be evaluating the benefits of the existing regional programs. This evaluation will measure the programs against the same performance measures as the other county projects. The Regional Bicycle and Pedestrian Program (RBPP) will assess how the Regional Bicycle Network will increase bike trips and decrease Vehicle Miles Traveled (VMT) to assess reduction in delay, collisions and emissions.

### **Existing Studies or Literature**

The state and local Safe Routes to School (SR2S) programs have been evaluated as to the effectiveness of achieving the program goals. Caltrans through the UC Berkeley Traffic Safety Center has conducted an evaluation of the past 6 cycles of the statewide program in reducing injuries, impact of walking and biking to school and the safety benefits compared with other highway safety program.<sup>1</sup> In general, the study showed a 10% increase in walking and biking with some observed increases in the 20% - 200% range. The collision reduction rate ranged from 0-49%.

The SR2S projects must address the five "E's" education, enforcement, encouragement and engineering. It is difficult to isolate which of these "E's" is most effective in achieving the study results. A combination of all or some of elements working together could be responsible. The RBPP program primarily funds capital programs so it is difficult to evaluate just the capital investment by comparing it to SR2S.

The BAAQMD uses a standard method to estimate emission savings from a bicycle facility for the Transportation Fund for Clean Air program. The method assumes that a new bicycle facility will generate new bicycle trips that replace auto trips. These new bicycle trips will reduce the ADT on a parallel vehicle facility and thereby result in emissions reduction.

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<sup>1</sup> Orenstein Marla R., Gutierrez, Nicolas, Rice, Thomas M., Cooper, Jill F., Ragland David R. 2007. Safe Routes to School- Safety and Mobility Analysis. Institute of Transportation Studies. Berkeley Traffic Safety Center. University of California, Berkeley, 2007 Paper UCB-TSC-RR-2007-1 <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1042&context=its/tsc>

This method is a very simplistic method that assumes that one bike trip will replace one auto trip and does not account for trip re-routing, new bicycle trip generation and does not account for pedestrian trips.

A sketch plan tool from the National Cooperative Highway Research Program<sup>2</sup> uses growth rates to estimate future bicycle commute trips from a given facility. These growth rates can be applied to areas to see how the completed regional bicycle network affects bicycle trips. This method assumes that the density of the bike network is positively correlated to bicycle trips. The big issue is that since no similar pedestrian network exists, then this method would not be able to provide an estimate on how pedestrian facilities affects pedestrian trips.

In the short time dedicated to researching methods to quantify bicycle and pedestrian programs, the tools available for bike/ped projects were limited. Most of the tools available relied upon intensive data such as facility type, counts of bicyclists and pedestrians and demand. Some studies have attempted to assess the economic value of different non-motorized modes. These studies such as from the Victoria Transport Institute quantify cost per mile of savings resulting from bicycle and pedestrian investments. Economic cost benefit studies use a range of numbers and rely upon disaggregate data, which is not readily available.

### **Preferred Method**

The lack of data is one of the major constraints to quantify how bike facilities affect bicycle trips. By using bike trip data and miles of bicycle facilities growth over a given time period, factors can be developed to estimate future growth from capital improvements. Some of these bicycle trips can be substituted for auto trips and the resulting VMT reduction can be used to calculate environmental, delay and safety targets.

Using data from Portland, Oregon, the City of Oakland and MTC's Travel Forecast, bicycle counts and total trips are used as a level of cycling activity. With the growth of the Regional Bicycle Network (RBN) and the city networks, we then get an average trip per mile of bikeway completed. Since there is an element of "natural" growth of bike trips, which are not all attributed to network growth, a percentage of these trips due to the growth of the network will be estimated at 25% to 75%.

Three rates will be calculated from each city for the estimated number of bicycle trips per mile of bikeway. To estimate the cost of how a dollar of the Regional Bicycle Pedestrian Program relates to number of bicycle trips in 2035, we need the number of bikeway miles that will be completed with the remaining \$200 million dollar commitment by 2035 and the total number of bicycle trips by 2035.

Since \$179 million remains in the RBPP, the number of miles of the RBN that can be completed will be estimated. Using the three bike trips per mile factors, times the miles of the RBN, we have the total bike trips by 2035 per mile.

Taking the \$179 million divided by 2035 bike trip/mile, the cost of bike trip per mile of RBN is generated. This number gives a basis of the benefit of additional cyclist per MTC's current program. Using the 2035 bike trips we can estimate the reduction of VMT from to bicycle riding.

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<sup>2</sup> Krizek Kevin J., Guidelines for analysis of investments in bicycle facilities, Transportation Research Board, National Cooperative Highway Research Program Report 552, Washington, D.C. 2006.

The change in VMT can be used to estimate the emissions reduction, delay and safety improvements.

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