

## MAXWELL BRIDGE AIR QUALITY ANALYSIS

### **Introduction**

This study analyses of the potential local level carbon monoxide (CO) impacts of the Maxwell Bridge project. This study has been conducted in accordance with the project-level Air Quality Protocol provided by Caltrans. This Protocol complies with, but does not make additional requirements to: Section 176(c) of the 1990 Clean Air Act Amendments, federal conformity rules, state and local adoptions of the federal conformity rules, the National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA) requirements [Cal. Code Regs., tit. 21, '1509.3(25)].

The Caltrans Protocol was designed on the premise that the entire region (the nine-county Bay Area) has been brought into compliance with state and federal air quality standards with regard to carbon monoxide. In fact, the Bay Area has made significant progress in reducing overall CO levels. Carbon monoxide levels are determined at both the state and federal level by an eight-hour and a one-hour standard. Both state and federal eight-hour standards are 9 parts per million (ppm), the state's one-hour standard is 20ppm and the federal one-hour standard is 35 ppm. According to records from the Bay Area Air Quality Management District's air monitoring stations, the region is now in continued attainment for both state and federal eight-hour CO standards. One-hour standards have not been violated since the early 1980's.

Due to the fact that the entire Bay Area is now in continued attainment for standards set for carbon monoxide emissions, the need for formal quantitative analysis of potential impacts for specific small and moderate scale projects has been replaced with the method of reasonable comparison. Specifically, Caltrans Protocol recommends the project be compared with a similar existing roadway or intersection which is currently in use and in an attainment area for CO. Although the Maxwell Bridge project is a replacement of the existing bridge, it would include widening the bridge from two to four lanes. The intersection of Imola Avenue and Soscol Avenue is approximately one-half mile east of the bridge and was selected for analysis of air quality impacts. For the purposes of this analysis, the intersection of Foothill Boulevard and Mission Boulevard in Hayward has been selected as an appropriate analogous intersection.

### **Intersection Analysis**

The intersection of Imola Avenue and Soscol Avenue is a four-legged intersection at which Soscol Avenue becomes the Napa Vallejo Highway. Imola Avenue, in Napa, is also known as Highway 121, a rural highway which traverses the Napa area. Lane configuration is as follows:

- ? Soscol Avenue/Napa Vallejo-Highway:
  - ? three lanes in the north-bound direction
  - ? three lanes in the south-bound direction

- ? Imola Avenue:
  - ? two lanes in the east-bound direction
  - ? one lane in the west-bound direction
- ? There is a series of left and right-hand turning lanes which are short lanes which begin and end about 100 to 200 feet from the intersection.

The intersection of Mission Boulevard and Foothill Boulevard is a five-legged intersection at which Foothill Boulevard, which is also known as State Highway 238, intersects with Jackson Street, which is also known as State Highway 92. Mission Boulevard, also known as State Highway 185, turns into State Highway 238. Mission Boulevard, Foothill Boulevard, and Jackson Street are all heavily traveled main highways. Lane configuration is as follows:

- ? Mission Boulevard has five through lanes.
- ? Jackson Street/Highway 92 has four lanes
- ? Where Jackson Street/Highway 92 splits to two streets the lane count increases to seven
- ? There is also a series of short turning lanes

The geometry of the Mission/Foothill intersection is significantly more complex and the lane count higher than that of the Imola/Soscol intersection.

Traffic lane volumes even at peak hours at the Soscol/Imola intersection are much lower than at the Mission/Foothill intersection. This can be attributed partially to the fact that Mission Boulevard and Foothill Boulevard are not only State Highways and links to other major Bay Area highways, but also main routes for a local high-density population. The percentage of Heavy Duty Gas Trucks is fairly similar at both locations although perhaps slightly higher at the Hayward location due to the greater concentration of industrial uses in the Hayward area. The average delay and queue length for each approach is also similar in both locations, although there seems to be a larger amount of congestion at traffic signals in the Hayward location.

The percentage of vehicles operating in cold start mode is estimated to be between 15-20% at the Napa location simply because the intersection is that of two outer arterials. The Hayward intersection is likely similar as the roads are similar. However, it might be somewhat higher partially due to the fact that a higher population in the Hayward area is commuting to work. In addition, there is a Bay Area Rapid Transit (BART) station within half a mile of the site which contributes to the percentage of cold start mode drivers.

Receptors near the Imola/Soscol intersection are relatively few. Land use in the area is mostly commercial rather than residential. Both the southwest and the southeast corners of the intersection are vacant. On the northeast corner is a Best Western Hotel and a Denny's restaurant. On the northwest corner is a Chevron gas station. Past the intersection of Imola/Soscol to the south, Soscol Avenue becomes the Napa Vallejo Highway, which is mostly bordered by open space, however there is a community center just south of the intersection which is set back from the road and bordered by a lightly wooded area. North of the intersection on Soscol Avenue are a series of

gas stations, fast food restaurants and a discount mall including several major discount stores. To the immediate east and west of the intersection is open space.

Receptors near the Mission/Foothill intersection are more numerous, but are similar in type to those near Imola/Soscol. On two of the five Acorners@ of this intersection are fast food restaurants, two other Acorners@ support small retail stores, a small furniture store and a Grand Auto store. Set back from the fifth corner is a three-story apartment complex. Land use on all of the five roadways immediately adjacent to this intersection are of the same variety, mostly small retail or restaurants with some residential. Because this is in a much more urban environment than the Soscol/Imola intersection there are a greater density of receptors in a much closer proximity to the intersection.

The over-all and worst-case meteorology of the Napa area and the Hayward area are very similar. However, the background concentration of CO and other air pollutants is most likely higher at the Hayward intersection due to the fact that Hayward is located in a very urban section of the Bay Area. The Napa intersection is located in a more rural area in which air quality is generally better. As aforementioned, according to the Bay Area Air Quality Management District's April 1996 report neither area has had any 1-hour standard CO violations since the early 1980's. Conversation with a BAAQMD public information operator verified that both areas are in attainment for CO.

### **Conclusion**

A comparison between the intersection of Soscol Avenue and Imola Avenue in Napa and Mission Boulevard and Foothill Boulevard in Hayward supports the idea that the replacement of the Maxwell Bridge with a four lane configuration will not result in a violation of the carbon monoxide standards set by the state or federal government. By comparing an intersection close to the Maxwell Bridge (which carries significantly more traffic than the bridge will) to the significantly busier intersection of Mission Boulevard and Foothill Boulevard in Hayward it can be concluded that:

- ? the Hayward intersection has a more complex configuration
- ? the Hayward intersection has more total lanes
- ? the Hayward intersection has a greater number of proximate receptors
- ? the Hayward intersection has greater traffic lane volumes
- ? the Hayward intersection and the Napa intersection have a comparable percentage of Heavy Duty Truck Traffic
- ? the Hayward intersection and the Napa intersection have a comparable average delay and queue length
- ? the percentage of vehicles operating in cold start mode at the Hayward intersection is higher than at the Napa intersection
- ? the meteorology and background concentrations of both the Napa and Hayward intersections are comparable although the Hayward intersection is potentially worse overall.

As a result of this comparison, and in light of the fact that the intersection of Mission Boulevard and Foothill Boulevard in Hayward is in an area of continued attainment for carbon monoxide standards and in accordance will Caltrans Protocol, it has been determined that the replacement and widening

of the Maxwell Bridge in the City of Napa will not contribute carbon monoxide levels that will cause the area to exceed the attainment threshold established by the BAAQMD.