



To Gary Sidhu, Alameda County Transportation Commission
From Michael Canepa, PE, HMM
Date 4/15/16
Project #
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CC Lee Abramson, Chris Metzger, Isaias Hernandez, Farhad Nourbakhsh
Subject SR262 Connector Study

This memo discusses various alternatives for conceptual design of a connection between I680 and I880 via Mission Blvd (SR262). The alternatives addressed in this memo include an aerial viaduct with two HOV lanes connecting directly from I880 to I680 and a trench structure with four general purpose lanes between the I880 Mission Blvd ramps and the I680 Mission Blvd ramps. The following information was evaluated in support of the findings of this study:

- Typical cross sections for each alternative
- Plan/profile for each alternative
- ROW impacts
- Utility impacts
- Environmental impacts
- Cost estimate

OPTION 1 – HOV CONNECTOR

The first alternative is to build an aerial viaduct connecting future planned HOV lanes on I880 directly to future planned HOV lanes on I680 along the Mission Blvd alignment. Local improvements at the I680 interchange are also included in this alternative.

Typical Cross Sections

Design Assumptions

- Design speed on HOV connector is minimum 50 mph
- Maximum roadway grade on HOV connector is 6%
- Roadway vertical clearance for local road is 15' (HDM 309.2)
- Roadway bridge depth
 - For typical span of 140' – 7' deep box girder
 - For 180' span – 8.5' deep box girder
 - For 250' span with 180' side spans – variable depth box girder 15' deep at columns and 8.5' deep at center of span
- No Caltrans design exceptions are needed



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- Freeway widening on I880 and I680 is assumed have occurred prior to this project. Therefore, HOV lane design and ROW impact assessment do not include impacts of freeway widening

The connector has one 12' HOV lane in each direction between I880 and I680. Shoulder widths are per HDM (Table 302.1). Mission Blvd maintains the current lane configuration of three lanes in each direction with left and right turn lanes at intersections per existing conditions. Lane and shoulder widths on Mission Blvd match existing.

Plan/Profile

The connector viaduct exits from future center HOV lanes on I880 and crosses existing I880 ramps to Mission Blvd, where it follows the Mission Blvd alignment, with columns in the center median. Assuming a 10' median throughout the length of Mission Blvd to accommodate the columns, the north side of Mission Blvd is shifted north while the south side of Mission Blvd remains unchanged. The connector viaduct then merges onto I680 at future center HOV lanes.

Single columns, 8' wide and 6' deep, support the aerial structure in the median of the freeways and in the median of Mission Blvd; Caltrans standard double column bents are used where possible elsewhere. Straddle bents are used where the structure crosses I880 and I680.

At the I680 interchange, local ramp improvements are incorporated to alleviate congestion at ramps. These improvements include creating a partial cloverleaf interchange by eliminating the northeast and southwest loop ramps. These ramps are replaced with signalized intersections at the northbound and southbound ramps. Based on an estimate of future traffic volumes for the year 2050, a second lane is added to the northbound on-ramp and to the southbound off-ramp to accommodate higher traffic volumes in those directions.

ROW Impacts

- Ramps to/from Kato Rd to Mission Blvd are closed – traffic reaches Mission Blvd via Warren Ave to Warm Springs Blvd



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- ROW impacts to the grassy area on Aver property on northwest side of Mission Blvd/Warm Springs Blvd intersection
- ROW impacts to shopping center on north side of Mission Blvd between Warm Springs and Mohave Dr., including impacts to parking and East West Bank building
- ROW impacts to grassy area in front of Jack in the Box building at northeast corner of Mission Blvd/Mohave Dr.

Utility Impacts

The columns and footings of the viaduct structure are to be designed such that they avoid conflicts with existing underground utilities to the maximum extent possible. Overhead power lines along Warm Springs Blvd at the Mission Blvd intersection maybe need to be relocated underground. Other impacts to utilities may occur with the widening of Mission Blvd on the north side of the existing roadway.

Environmental Impacts

The two major environmental concerns in the study area are the Agua Caliente Creek and the Agua Fria Creek. Agua Caliente Creek runs in a pipe under Mission Blvd at the I680 interchange and then turns to the northwest, where it daylights to an earthen channel. Agua Fria Creek runs in a box under I680 just south of the Mission Blvd interchange. It daylights to a channel after passing below the interchange and then turns to parallel Mission Blvd where it enters a concrete box.

The columns and footings of the viaduct structure are to be designed such they avoid impacting the two creeks and their box structures at locations where the alignment crosses the creeks. Impacts to Agua Fria Creek due to improvements to local traffic on Mission Blvd are avoided by holding the existing curb and gutter on the south side of the street such that any roadway widening occurs on the north side of Mission Blvd away from the creek.

OPTION 2 – TRENCH

The second alternative is to build a trench down the center of Mission Blvd so that through traffic can bypass traffic signals and turning movements at driveways located between I880 and I680. Local improvements at the I680 interchange are also included in this alternative.



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Three scenarios are evaluated, with varying levels of through traffic and local traffic separation.

Typical Cross Sections

Design Assumptions

- Design speed for through traffic is 45 mph
- Maximum roadway grade for through traffic is 8%
- Roadway vertical clearance for through traffic is 16.5' (HDM 309.2)
- Trench cover depth is 6'
- Trench walls have 1' facing with 4' drilled caissons
- Trench invert slab depth is 5'
- No Caltrans design exceptions are needed

Two of the three existing lanes in each direction on Mission Blvd are lowered into a trench between the rail bridges and the I680 interchange. These lanes are to be used by through traffic to bypass local congestion. Lane widths are 12'; shoulder widths are 2' for inside shoulder and 8' for outside shoulder per HDM (Table 302.1).

The third existing lane in each direction is used for local traffic accessing local street connections and businesses on Mission Blvd. A second local traffic lane in each direction is added between Warm Springs Blvd and Mohave Dr. Lane widths for local traffic on Mission Blvd are 10' with a 2' inside shoulder and 8' outside shoulder.

Plan/Profile

Option 2a provides grade separation for through traffic at the Warm Springs Blvd and Mohave Dr. intersections via a trench down the center of Mission Blvd. Through traffic conforms to existing grade just east of the rail bridges spanning Mission Blvd and just west of the I680 interchange, where it joins local traffic.

Option 2b provides grade separation for through traffic at Warm Springs Blvd only, which is the larger and more highly used intersection along Mission Blvd. Through traffic merges with local traffic farther west of the I680 interchange than in Option 2a. Because there is



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insufficient weaving room to merge through traffic with local traffic west of the Mohave Dr. intersection, movement that intersection is limited to right in and right out traffic only.

Option 2c provides no grade separation of through traffic along Mission Blvd.

For all three scenarios, local ramp improvements are incorporated at the I680 interchange to alleviate congestion at ramps. These improvements include creating a partial cloverleaf interchange by eliminating the northeast and southwest loop ramps. These ramps are replaced with signalized intersections at the northbound and southbound ramps. Based on an estimate of future traffic volumes for the year 2050, a second lane is added to the northbound on-ramp and to the southbound off-ramp to accommodate higher traffic volumes in those directions.

Another option that was evaluated for effectiveness at relieving congestion at the Warm Springs Blvd/Mission Blvd intersection was a roundabout. This option is not recommended, however, due to the fact that per the calculations performed, a three lane roundabout cannot handle the existing traffic at the intersection above a Level of Service (LOS) of F, and therefore, would not effectively handle the increase in future volumes.

ROW Impacts

Option 2a

- Ramps to/from Kato Rd to Mission Blvd are closed – traffic reaches Mission Blvd via Warren Ave to Warm Springs Blvd
- ROW impacts to the grassy area on Aver property on northwest side of Mission Blvd/Warm Springs Blvd intersection
- ROW impacts to shopping center on north side of Mission Blvd between Warm Springs and Mohave, including impacts to parking, the East West Bank building, and the Carl's Jr building
- ROW impacts to grassy area in front of Jack in the Box building
- ROW impacts to grassy area in front of Bank of America building
- ROW impacts to shopping strip mall on south side of Mission Blvd at Mohave, including impacts to building



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- ROW impacts to Valero gas station
- ROW impacts to parking at Extended Stay America property

Option 2b

- Ramps to/from Kato Rd to Mission Blvd are closed – traffic reaches Mission Blvd via Warren Ave to Warm Springs Blvd
- ROW impacts to the grassy area on Aver property on northwest side of Mission Blvd/Warm Springs Blvd intersection
- ROW impacts to shopping center on north side of Mission Blvd between Warm Springs and Mohave, including impacts to parking, the East West Bank building, and the Carl's Jr building
- ROW impacts to shopping strip mall on south side of Mission Blvd at Mohave, including impacts to building
- ROW impacts to Valero gas station
- ROW impacts to grassy area in front of Extended Stay America property

Option 2c

- No ROW impacts will occur

Utility Impacts

Relocation of underground utilities in Mission Blvd, as well as Warm Springs Blvd and Mohave Dr., are necessary to accommodate the profile of the trench as it runs below existing grade in the center of Mission Blvd. Other impacts to utilities may occur with the widening of Mission Blvd on both sides of the existing roadway. Impacts to utilities vary based on the three options described above with the most impacts occurring with Option 2a. All three options avoid impacts to the Hetch Hetchy line, which crosses beneath the existing southeast loop ramp of the I680 interchange.

Environmental Impacts

The two major environmental concerns in the study area are the Agua Caliente Creek and the Agua Fria Creek as described above in Option 1. Impacts to Agua Fria Creek due to



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improvements to local traffic on Mission Blvd are avoided by limiting the amount of widening on the south side of the existing roadway. Impacts to Agua Caliente Creek are avoided by bringing the trench up to existing grade before the creek passes under Mission Blvd.

COST ESTIMATE

A preliminary cost estimate for each alternative for comparative purposes is provided as Attachment A to this memo. The major civil components used to produce the preliminary cost estimates include earthwork, trench and viaduct structures, pavement and striping, signage, signals, and right-of-way costs. Soft costs for professional services and contingency costs have been included as percentages of estimated construction and project costs.