

memorandum



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To: **Mr. Steve Marshall**
City of Novato

From: Zack Matley

Project: NOV911

Subject: San Marin Interchange Findings – Alternatives 1 and 2

W-Trans has completed an analysis of interchange operation under the following two different buildout scenarios developed by the City.

Alternative 1

- Increase Birkenstock build-out by 100,000 square feet of office
- Assume land use intensity proposed by the previously-proposed American Assets project
- Assume a new connection to the American Assets site from Redwood Boulevard
- Include southbound off and northbound on “hook ramps” to US 101 approximately one mile to the north of San Marin Drive.
- Assume mitigation currently included in the General Plan/CIP plus signalization at Binford/Atherton (previously identified as necessary under all future scenarios)

Alternative 2

- Increase Birkenstock build-out by 100,000 square feet of office
- Assume land use intensity proposed by the previously-proposed American Assets project
- Assume buildout of San Marin Business Park Site 6c to be 300 multi-family units
- Assume buildout of San Marin Business Park Site 6d to be 100-room senior assisted living
- Only assumes mitigation currently included in the General Plan/CIP plus signalization at Binford/Atherton

Findings

Both alternatives result in substantial improvements to traffic operation and queuing compared to previous analyses conducted for the Commons at Mount Burdell (American Assets) project. The new hook ramps assumed in Alternative 1 would remove approximately 900 AM peak hour trips and 600 PM peak hour trips from the San Marin interchange, with approximately 400 vehicles using the new Redwood Boulevard connection to the American Assets site during each peak hour. The reduced intensity in North Redwood Boulevard development assumed in Alternative 2 also frees up a substantial amount of capacity at the interchange and the Redwood/San Marin intersection compared to prior analyses. Despite these improvements, however, adverse operation and queuing at Redwood/San Marin would still be expected at buildout with both alternatives.

The findings of the operational analysis are shown in Table I.

**Table I
Summary of Operational Findings**

Alternative	LOS	Queuing
Alternative 1	Ramps operate at LOS C during both peak hours. Redwood/San Marin operates at LOS D in the morning but LOS F in the afternoon.	Queues are generally acceptable in the morning, though EB queues would extend just beyond E. Campus Dr. In the afternoon, there would be extensive queues on EB San Marin and SB Redwood. During both peak hours, queues on the ramps would not extend onto US 101.
Alternative 2	Ramps operate at LOS C-D during both peak hours. Redwood/San Marin operates at LOS D in the morning and LOS F in the afternoon.	Queues are generally acceptable in the morning though nearly reach the mainline freeway at the US 101 South Ramps. In the afternoon there is extensive EB and NB queuing at Redwood/San Marin (worse than Alternative 1) though offramp queues remain acceptable.

Potential Mitigation with Alternatives

A preliminary evaluation of the mitigation measures needed to improve operation with Alternatives 1 and 2 was completed. The majority of additional improvements are common between the Alternatives, though Alternative 1 would require several more improvements than Alternative 2. Following is a list of the assumed improvements. Screenshots of the mitigated lane configurations are enclosed.

Common Mitigation with Alternatives 1 and 2

- Widen railroad overpass to 9 lanes (one more lane than assumed in CIP and current General Plan), comprised of four eastbound lanes and five westbound lanes
- Modify Redwood/San Marin intersection as follows:
 - Reconfigure northbound lane configuration to L-T-R-R (possible minor widening)
 - Reconfigure eastbound lane configuration to L-T-T-T-TR (striping change compared to current CIP and General Plan mitigation)
- Modify and widen US 101 S Ramps/San Marin Drive intersection eastbound approach to T-T-R-R (facilitated by widening of railroad overpass to 9 lanes)

Additional Alternative 1 Mitigation

- Install signal or roundabout at Redwood Boulevard/Rush Landing Road with connection to American Assets project
- Add channelized southbound right turn island at Redwood/San Marin (minor improvement)
- Reconfigure lanes on freeway overpass as follows (no widening required):
 - Westbound – three through lanes plus 250 foot long left turn pocket at SB Ramps
 - Eastbound – one through lane, one full-length left turn lane, and one 75-foot long second left turn pocket at NB ramps

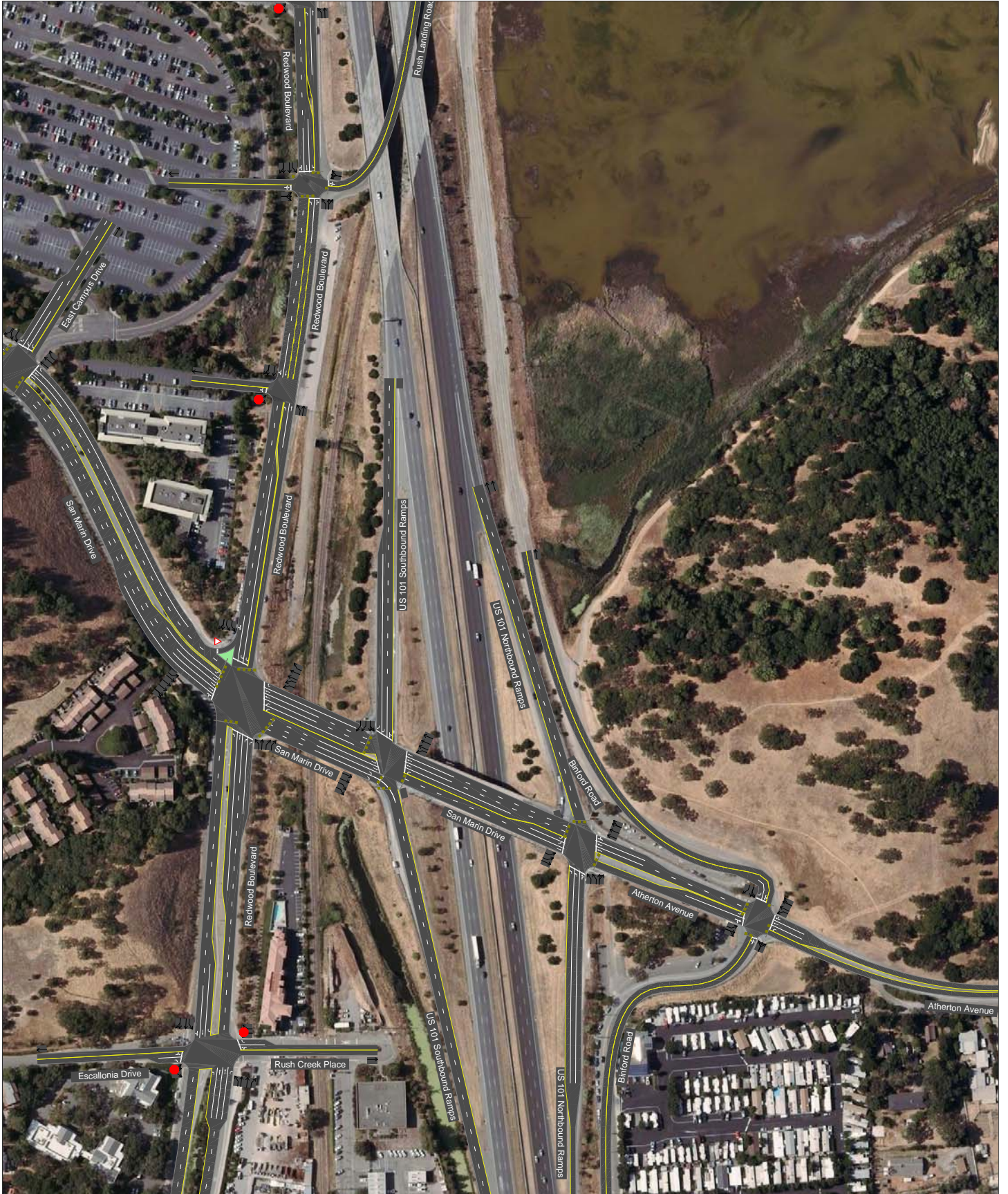
A summary of the projected operation and queuing with these mitigations is shown in Table 2.

Table 2
Summary of Operational Findings with Mitigation

Alternative	LOS	Queuing
Alternative 1 (Mitigated)	Redwood/San Marin and interchange intersections operate at LOS C during both peak hours.	Queues are generally acceptable and would not extend onto US 101.
Alternative 2 (Mitigated)	Redwood/San Marin operates at LOS D, and interchange intersections operate at LOS C-D during both peak hours.	Queues may occasionally extend from the southbound ramps onto mainline US 101 during the a.m. peak hour.

As shown in Table 2, Alternative 1 would function better than Alternative 2 with mitigation. In Alternative 2, we made attempts to alleviate the potential southbound ramps queuing onto US 101, though ultimately the capacity constraint was found to be at the Redwood/San Marin intersection where additional mitigation beyond that already identified would likely be cost prohibitive. Use of a diverging diamond interchange (DDI) as previously analyzed could further improve operation at the freeway ramp intersections in both Alternatives 1 and 2, though as with the current configuration a DDI would be susceptible to adverse queuing experienced at the Redwood/San Marin intersection.

Alternative 1 Potential Mitigation Scheme



Alternative 2 Potential Mitigation Scheme

