

memorandum



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Date: December 21, 2012
To: **Mr. Steve Marshall** From: Zack Matley
City of Novato Project: NOV911

Subject: Initial List of San Marin Drive Interchange Options

Following is a summary of mitigation concepts that have been identified by City Staff and consultants during the past several years, as well as a summary of other interchange types and their relative pros and cons. In addition to documenting past efforts, this information is intended to be used as a catalyst to spur additional ideas from W-Trans and City Staff.

Option 1 – Mt. Burdell Cumulative Mitigation

This option was developed by Fehr & Peers to achieve LOS D upon buildout of the City's General Plan, North Redwood Redevelopment project, and the Commons at Mt. Burdell Project. The mitigation includes:

- Widen freeway overpass to provide three additional lanes
- Widen railroad overpass to provide five additional lanes
- Close existing US 101 Southbound offramp
- Build new hook ramps to and from US 101 South opposite Wood Hollow Drive
- Signalize Atherton/Binford intersection
- Widen Atherton Avenue, San Marin Drive, Redwood Drive, Binford Road, and the freeway ramps to and from the south

This concept was not recommended for implementation; rather, it was intended to depict the level of infrastructure that may be required to accommodate future traffic volumes, and to demonstrate the potentially undesirable repercussions of such large-scale improvements to pedestrians and bicyclists. The concept would almost certainly be infeasible from a financing perspective, and the configuration of the Wood Hollow freeway ramps would likely be prohibited by Caltrans. From many perspectives this option may be considered the "worst case" mitigation scenario.

Option 2 – Realign North Redwood Boulevard

Under this scenario, the segment of North Redwood Boulevard immediately north of San Marin Drive would be abandoned, creating a tee-intersection at Redwood/San Marin. Additional components include:

- Realign the northern portion of Redwood Boulevard between Rush Landing Road and San Marin Drive to instead intersect at East Campus Drive
- Widen railroad overpass to provide three additional lanes
- Signalize Atherton/Binford intersection

- Widen portion of Atherton Avenue and US 101 ramps to and from the south

The intent of this concept is to improve the efficiency of the Redwood Boulevard/San Marin Drive intersection, and thereby improve efficiency of the entire interchange. The new northern segment of Redwood Boulevard would pass through property currently owned by American Assets, requiring dedication or condemnation. This concept has only been tested at a preliminary level and may not accommodate the maximum level of cumulative growth (including the previously-proposed Commons project).

Option 3 – New Ramps to and from US 101 North

This scenario relieves traffic volumes at the interchange by adding a set of additional freeway ramps to the north. Features include:

- Add a new southbound hook offramp at the Redwood Drive/Wood Hollow Drive intersection (similar to that shown in Option 1 but with no southbound onramp)
- Add a new hook onramp to US 101 North near the current terminus of Rush Landing Road, extending the ramp alongside the freeway until a point that is 1.0 mile north of San Marin Drive in order to meet Caltrans interchange spacing standards
- Realign and widen Redwood Boulevard near Wood Hollow Drive
- Construct a partial multi-lane roundabout at Redwood Boulevard/Rush Landing Road
- Add a new access point into the Commons site as a fourth leg at Redwood/Rush Landing
- Additional capacity improvements at the existing interchange would be required, similar to those shown in Option 3, but with less widening of the railroad overpass

The new ramps would require Caltrans design exceptions, though as depicted in the attached exhibit would not be expected to result in significant adverse impacts to the mainline freeway. The roundabout is consistent with concept plans prepared by SMART for the adjacent commuter rail station, and plays an important role in station area multimodal circulation. One concern with this scenario is that the new ramps draw traffic primarily from parcels north of San Marin Drive; creation of a new access point onto Redwood Boulevard from the American Assets parcel would be an important step in drawing as much traffic as possible away from the existing interchange.

Option 4 – Redwood Boulevard Grade Separation

With this option, Redwood Boulevard would be lowered to pass underneath San Marin Drive, and a new roadway connecting the northern section of Redwood Boulevard to San Marin Drive would be constructed. Key aspects of this option include:

- Construct an overpass on San Marin Drive that passes over a newly-lowered section of Redwood Boulevard
- Provide a ramp to serve right turning movements between northbound Redwood Boulevard and eastbound San Marin Drive
- Construct a new roadway between Redwood Boulevard and San Marin Drive, running between existing intersections at Rush Landing Road and East Campus Drive
- Construct roundabout at Redwood Boulevard/Rush Landing Drive
- Additional capacity improvements at the existing interchange would likely be required, though overpass widening may not be needed

As with Option 2, a new roadway would need to be built through the American Assets site, potentially requiring condemnation or dedication. The grade separation at Redwood Drive would likely be very expensive, requiring major earthwork, utility relocations, and long-term disruptions to traffic flow in the northern portions of Novato. The grade separation would, however, be likely to substantially increase traffic capacity at the interchange, and could be designed to substantially improve pedestrian and bicycle circulation in the area.

Other Interchange Types

Three nonstandard interchange types are discussed below, with photo examples shown on the following page.

Single Point Urban Interchange (SPUI)

This type of interchange combines two ramp intersections into a single central intersection, and can work well from a traffic perspective in some circumstances. They do consume a sizable footprint in order to achieve the required geometry, and in the case of the San Marin interchange would require construction of a substantially wider overpass deck. SPUIs can also introduce challenges to pedestrians and bicyclists attempting to traverse the interchange.

Roundabout Interchange

Roundabout interchanges are being deployed throughout the United States with great success, and are particularly advantageous in their ability to reduce queues. While these interchanges can handle significant traffic volumes, preliminary analysis suggests that they may not be able to handle the traffic levels anticipated at the San Marin interchange. The ability to achieve proper geometry may also be compromised by the tight spacing of adjacent intersections at Binford Road and Redwood Boulevard.

Diverging Diamond Interchange (DDI)

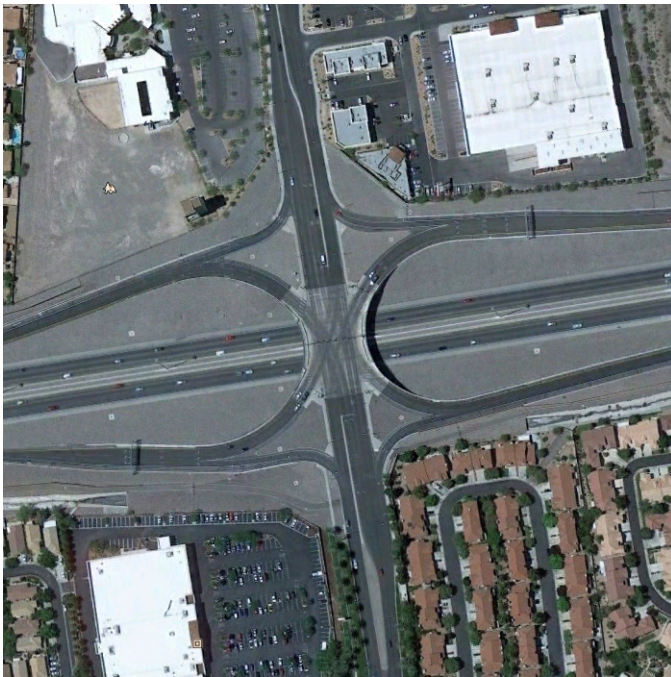
DDIs are one of the newer intersection types being explored in the United States. They shift traffic to the opposite side of the street between ramp intersections to better accommodate certain types of traffic flow patterns, including ramps with especially heavy left turn volumes. Preliminary investigation suggests that this configuration may work well at the San Marin interchange, though as with other interchange types the proximity of Binford Road and Redwood Boulevard presents challenges. DDIs also require special attention to pedestrian circulation that must be examined closely.

W-Trans will work internally and with Staff to develop additional mitigation options, some of which may include portions of the mitigations described above.

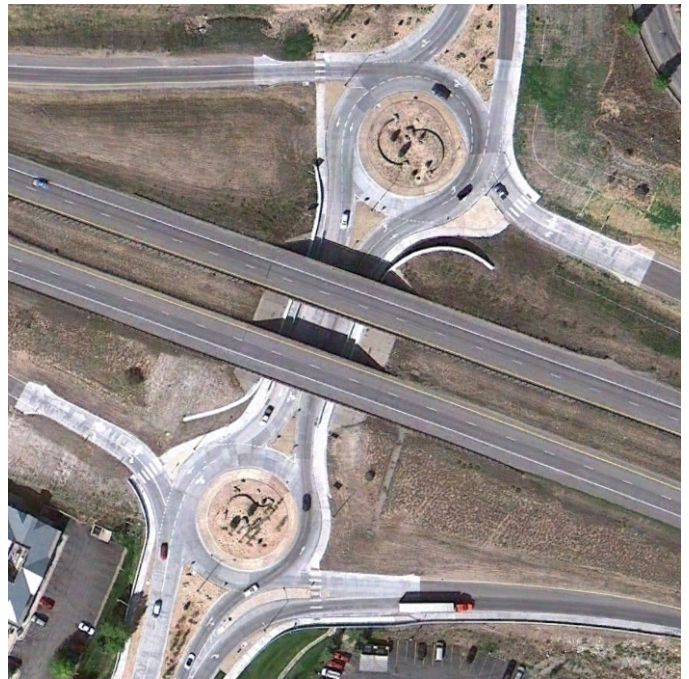
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Attachments: Photos of Single Point, Roundabout, and Diverging Diamond Interchanges
Option 1 Exhibit – Mt. Burdell Cumulative Mitigation
Option 2 Exhibit – Realign North Redwood Boulevard
Option 3 Exhibit – New Ramps to and from US 101 North
Option 4 Exhibit – Redwood Boulevard Grade Separation

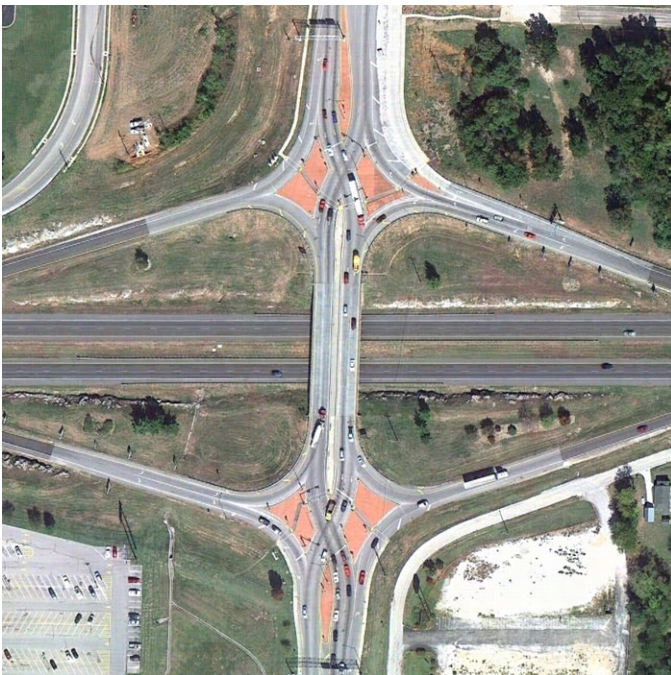
Other Interchange Types



Single Point Interchange

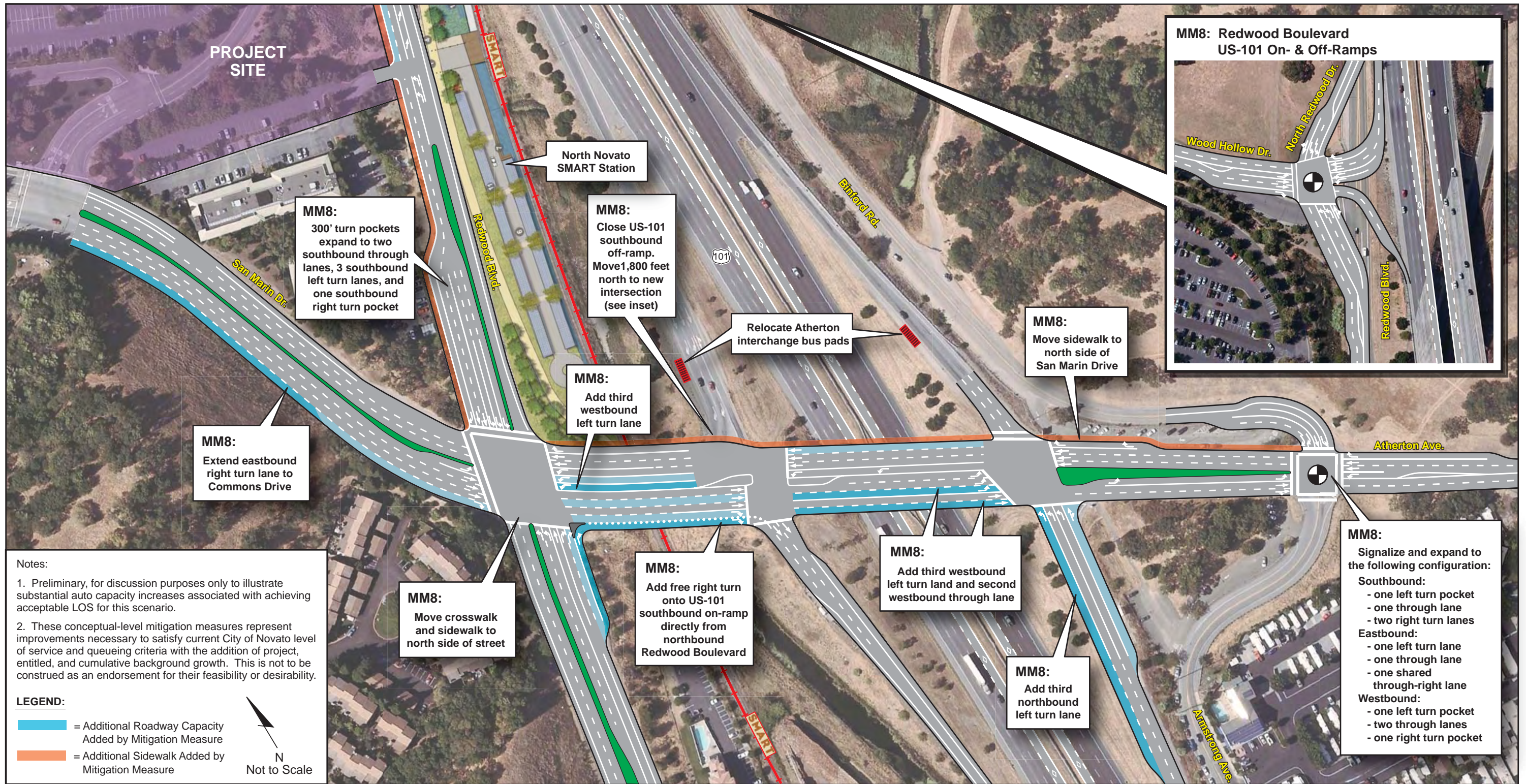


Roundabout Interchange



Diverging Diamond Interchange

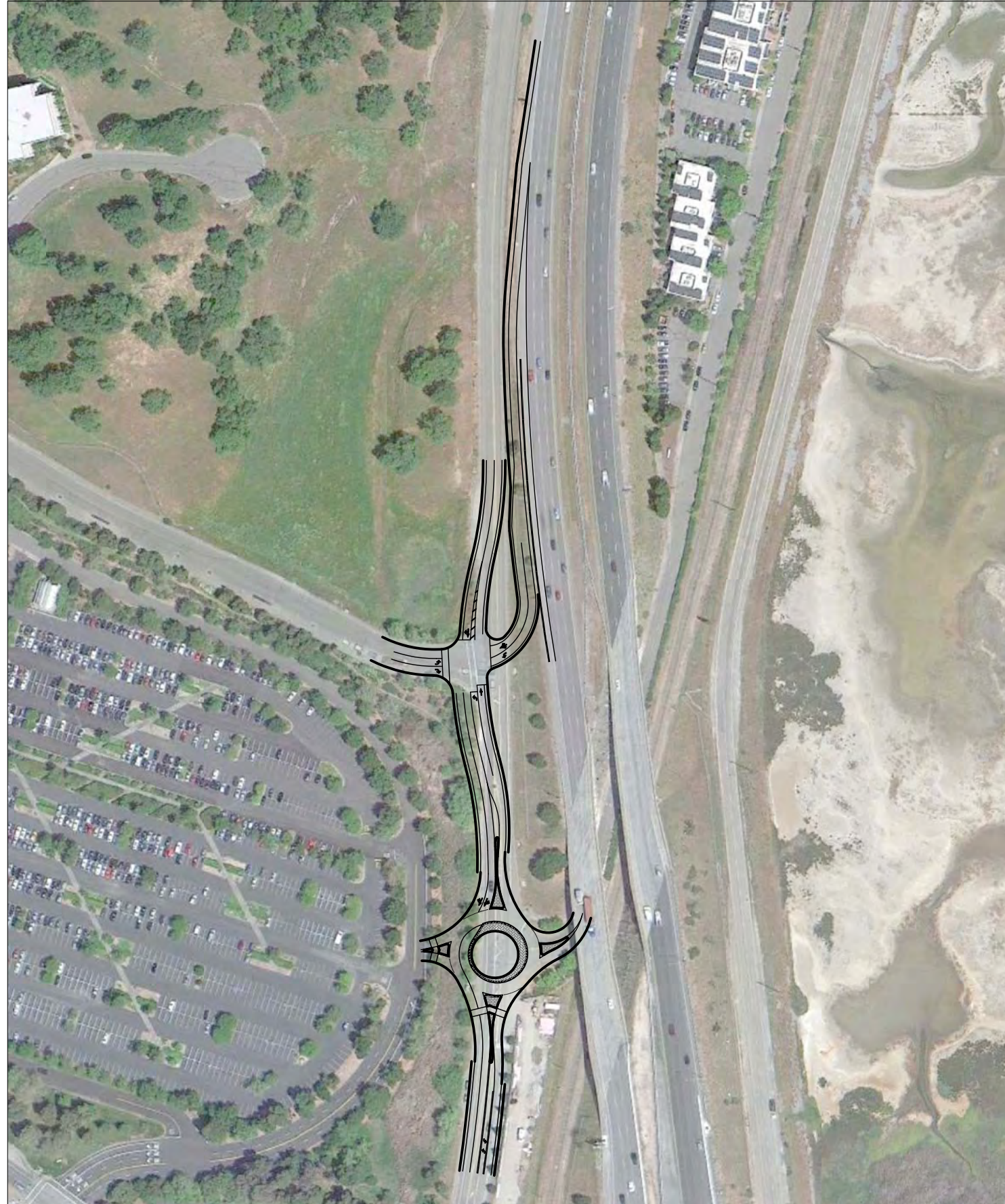
OPTION I - Mt. Burdell Cumulative Mitigation



OPTION 2 - Realign North Redwood Boulevard



OPTION 3 - New Ramps to and from US 101 North



Southbound Offramp



Northbound Onramp

OPTION 4 - Redwood Boulevard Grade Separation

