

LEFT-OUT ANALYSIS



Technical Memorandum 3

To: City of Redding
Attn: Mr. Kent Manual
From: Russ Wenham, P.E., T.E.
Kamesh Vedula, P.E., T.E.
Re: Left-Out Analysis for the Southern
Bechelli Lane Driveway
CC: Mr. Michael Okuma - Costco

Date: January 31, 2018
Project: River Crossing Marketplace Specific
Plan (Costco Wholesale
Development)
Job No.: 11145014
File No.: C2226MEM020.DOCX

Introduction

The intersection of Bechelli Lane & Southern Driveway was analyzed as a right-in right-out with the most recent River Crossing Marketplace TIAR (dated November 2017). Omni-means was requested to analyze the operations at this driveway as a three-quarter access (right-in, right-out, and left-out). This Technical Memorandum analyzes the operations associated with three-quarter access at this Southern Driveway.

Operations

The City of Redding Traffic Impact Analysis (TIA) guidelines consider Level of Service (LOS) C as the standard acceptable threshold for the intersection of Bechelli Lane/Southern Driveway. The lane configuration for the driveway approach includes left turn and a right turn lane. The left out was analyzed with a receiving lane on Bechelli Lane to accommodate a two-stage gap acceptance.

Year 2020 Plus Project Conditions with the left out

The TIAR was analyzed with only a right out movement and had an intersection LOS B. With the addition of a left turn lane, under Year 2020 Plus Project conditions, the projected AM, PM, and Saturday peak hour LOS are LOS D (25 seconds of delay), LOS D (26.5 seconds of delay), and LOS C (21.4 seconds of delay), respectively. The intersection is projected to operate at unacceptable LOS during both the AM and PM peak hours under Year 2020 Plus Project conditions. The projected 95th percentile queue for the westbound left during the AM peak hour is 95 feet, PM peak hour is 105 feet, and Saturday peak hour is 88 feet.

Year 2040 Plus Project Conditions with the left out

The TIAR was analyzed with only a right out movement and had an intersection LOS B. With the addition of a left turn lane, under Year 2040 Plus Project conditions, the projected AM, PM, and Saturday peak hour LOS are LOS E (35.5 seconds of delay), LOS E (48.9 seconds of delay), and LOS D (30 seconds of delay), respectively. The intersection is projected to operate at unacceptable LOS during AM, PM, and Saturday peak hours under Year 2040 Plus Project conditions. The projected 95th percentile queue for the westbound left during the AM peak hour is 133 feet, PM peak hour is 170 feet, and Saturday peak hour is 125 feet.

Year 2040 Plus Project with Redding Rancheria Conditions with the left out

Based on the analysis for Year 2040 Plus Project conditions, AM and PM peak hours were only analyzed under the Year 2040 Plus Project with Redding Rancheria conditions as these were identified to be the worst performing.

Under Year 2040 Plus Project with Redding Rancheria conditions, the projected AM and PM peak hour LOS are LOS E (37.1 seconds of delay) and LOS F (54.3 seconds of delay), respectively. The intersection is projected to operate at unacceptable LOS during both the AM and PM peak hours under Year 2040 Plus Project with Redding Rancheria conditions. The projected 95th percentile queue for the westbound left during the AM peak hour is 138 feet and PM peak hour is 183 feet.

Impacts to Adjacent Intersections

Based on City of Redding TIA Guidelines 3.5A, impacts to other driveways and intersections need to be analyzed. Therefore, the queuing at the intersection of Bechelli Lane & Blue Shield/ Costco Driveway was analyzed for Year 2040 Plus Project conditions as Year 2040 is projected to be worse than Year 2020 conditions. All queues were developed based on an average vehicle length of 25 feet and Synchro modeling software.

Year 2040 Plus Project Conditions with the left out

The intersection of Bechelli Lane & Blue Shield Driveway/Costco Driveway is located approximately 345 feet to the north of the proposed location for the Southern Driveway. Currently, the northbound left turn pocket is 290 feet in length. The current storage accommodates AM, PM, and Saturday peak hour 95th percentile queues that are projected to be 185, 38, and 22 feet, respectively.

The northbound through 95th percentile is projected to be 303, 324, 243 feet during the AM, PM, and Saturday peak hours, respectively. During the AM and PM peak hours, the 95th percentile queues are barely accommodated within the available storage.

Year 2040 Plus Project with Redding Rancheria Conditions with the left out

The intersection of Bechelli Lane/Blue Shield Driveway/Costco Driveway is located approximately 345 feet to the north of the proposed location for the Southern Driveway. Currently, the northbound left turn pocket is 290 feet in length. The current storage accommodates AM and PM peak hour queues that are projected to be 138 and 183 feet, respectively.

The northbound through 95th percentile is projected to be 310 and 340 feet for the AM and PM peak hours, respectively. The 95th percentile queues are barely accommodated within the available storage.

Recommendations

To ensure a left out movement can be accommodated when queues could potentially spillback and affect operations at the intersection of Bechelli Lane/Southern Driveway, "Keep Clear" markings are recommended at the intersection of Bechelli Lane/Southern Driveway. This will allow the left turn movement out of the project site to occur when the projected queue spillback would otherwise block the intersection of Bechelli Lane & Southern Driveway. Additionally, queue detectors are recommended for the northbound left turn lane of the Bechelli Lane/BlueShield Driveway/Costco Driveway intersection to extend the northbound green time to minimize the instances when the queue spillback affects the downstream intersection.

The attached figure presents an updated preliminary design that accommodates the three-quarter intersection.

Conclusions

With the recommended improvements, a left out at the intersection of Bechelli Lane/Southern Driveway could be provided during the AM, PM, and Saturday peak hours for Year 2040 Plus Project and Year 2040 Plus Project with Redding Rancheria conditions.

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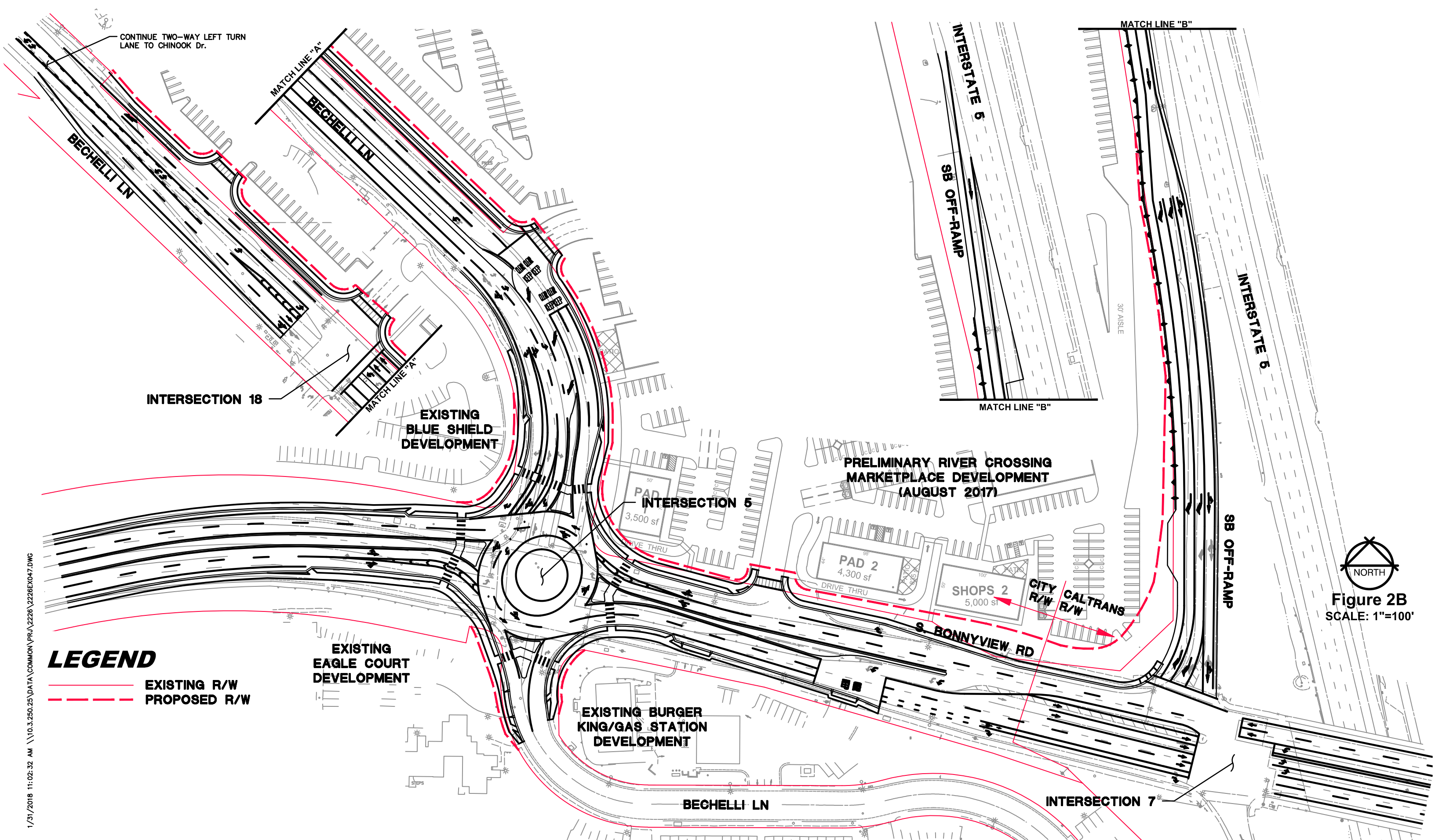


Figure 2B
SCALE: 1"=100'

Off-Site Mitigations - S. Bonnyview Rd/Bechelli Ln Details - Roundabout Alternative

River Crossing Marketplace Development



January 23, 2018
2226EX047.dwg

