SR-91 / ADAMS STREET – INTERCHANGE RECONFIGURATION

Public Works Department

Mobility and Infrastructure Committee

June 11, 2020

BACKGROUND

1. The City began exploring strategies to reconstruct and reconfigure the overcrossing and interchange at Adams Street near the SR-91to:
   a. Address significant traffic congestion during peak hours;
   b. Meet forecasted future traffic demands;
   c. Promote Active Transportation;
   d. Accommodate future SR-91 widening; and
   e. Provide a minimum bridge vertical clearance of 16 ft. 6 in.

BACKGROUND (CONT.)

2. On 11/28/17, City Council approved appropriation of $4.1 million in TUMF fees to fund the Project Approval and Environmental Document (PA&ED) phase of the project;
3. In April 2018, Public Works submitted the City funded Project Study Report – Project Development Support (PSR-PDS) to Caltrans for approval to proceed to PA&ED;
4. On 5/10/18, Caltrans approved moving the project into the PA&ED Phase; and

BACKGROUND (CONTINUED)

5. On 3/4/20, the Transportation Board reviewed the matter and recommended that the Transportation Committee:
   a. Review, receive, and file this report;
   b. Recommend that the City Council continue to support the Project; and
   c. Provide feedback on the Oval Roundabout concept design, Alternative 1.1.

PROJECT AREA MAP

5

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PSR-PDS PHASE

1. Proposed Project Key Design Parameters would include:
   a. Adams St overcrossing reconstruction to at least 2 thru lanes each direction and minimum 16'-6" vertical clearance;
   b. Reconfiguration of SR-91 on/off ramps at Adams St to reduce congestion;
   c. Reconfiguration of Adams St intersections at Diana and Indiana Aves to accommodate widening /ramp reconfigurations; and
2. Design Alternatives:
   a. 10 design options were originally evaluated;
   b. 2 design alternatives were selected and a "no-build" 3rd option included in the Caltrans approved PSR-PDS.

6

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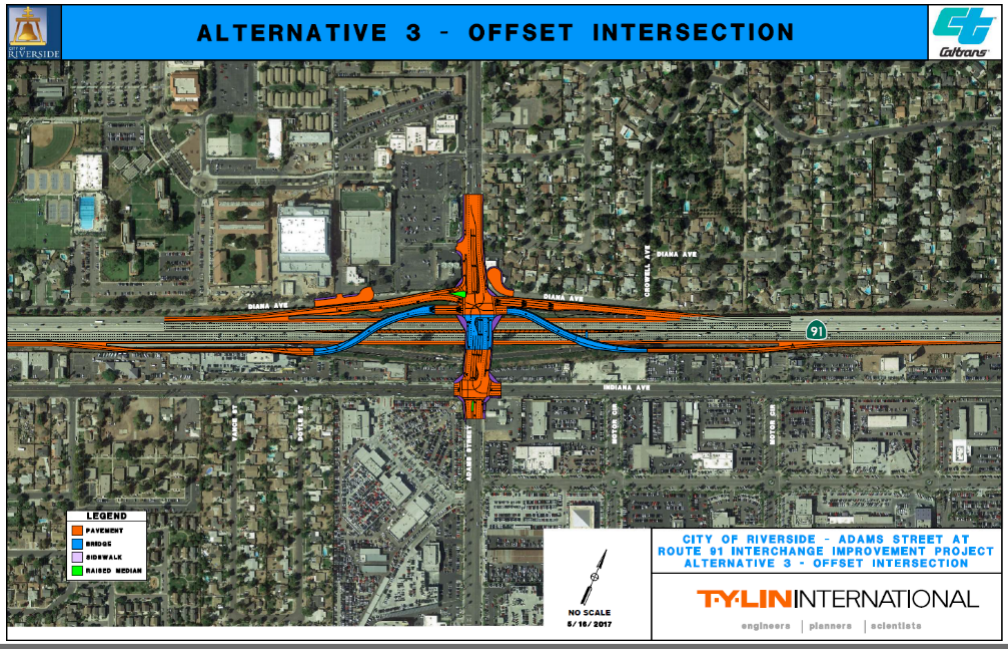
PA&ED PHASE

1. Initial steps of this phase included:
   a. Retained the services of outside consultant TYLIN ; and
   b. Worked in with TYLIN and Caltrans to review project scope, alternatives, and develop any additional viable design concepts.
2. November 2019 Workshop:
   a. City and TYLIN staff attended a 5 day workshop to further analyze design alternatives; and
   b. Focused on optimizing performance, minimizing R/W impacts, improving project value, and reviewing project impacts north of the westbound ramps.

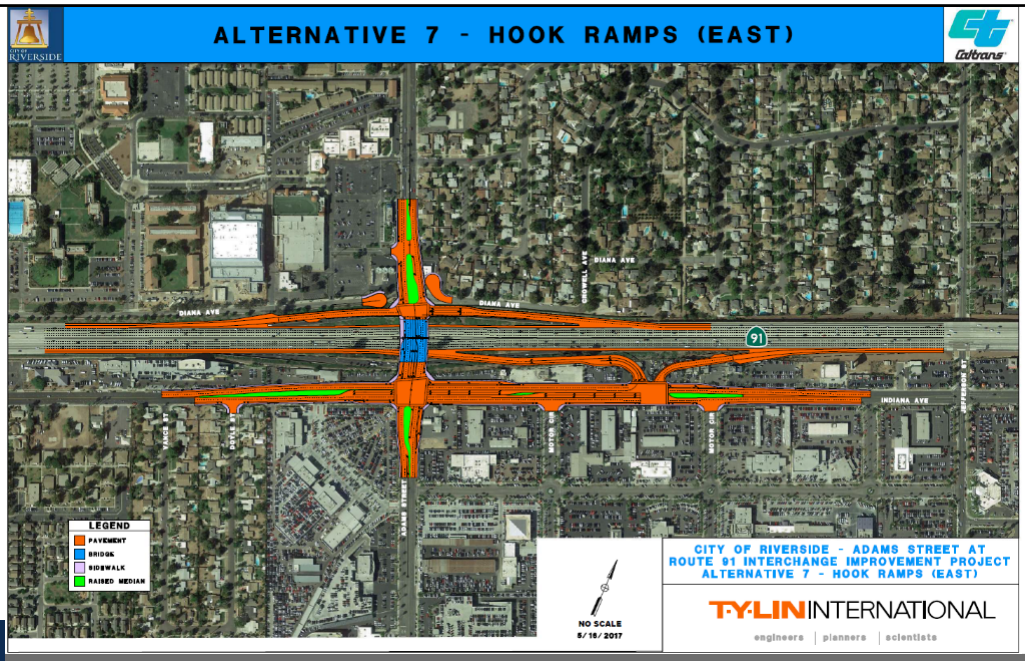
WORKSHOP RESULTS – VALUE ANALYSIS STUDY

1. Based on the 5-day workshop TYLIN prepared a Value Analysis Study which:
   a. Proposed 4 new additional design alternatives;
   b. Identified key factors, constraints, and issues for each;
   c. Formulated ideas for potential minor modifications to the 2 originally selected alternatives; and
   d. Provided comparative analysis of estimated project cost, and performance and value change for each of the 6 designs.
2. All alternatives included improvements to bring the bridge height / clearance to standard.



ORIGINALLY SELECTED ALTERNATIVE 3

1. Concept is an offset intersection design model at the north side of SR-91with displaced EB ramps landing near the WB ramps;
2. Advantages include less R/W required, increased queuing distance between ramps and Indiana Ave, and enables improved signal timing on Adams St; and
3. Challenges entail maintenance/viability of overcrossing structures, consolidation of multiple heavy movements into a single small footprint intersection, and minimal capacity gains.



11

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ORIGINALLY SELECTED ALTERNATIVE 7

1. Model similar to Van Buren Blvd at SR-91 and using a hybrid configuration with EB hook ramps connecting to Indiana Ave and WB ramps tying into Adams St near their current location;
2. Advantages include eliminates storage shortfall on Adams St due to proximity of EB off-ramp to Indiana Ave, adds queuing spaces on Adams St, and involves less maintenance; and
3. Challenges involve the substantial R/W requirements, and an extended travel route for motorists traveling to / from the north.

12

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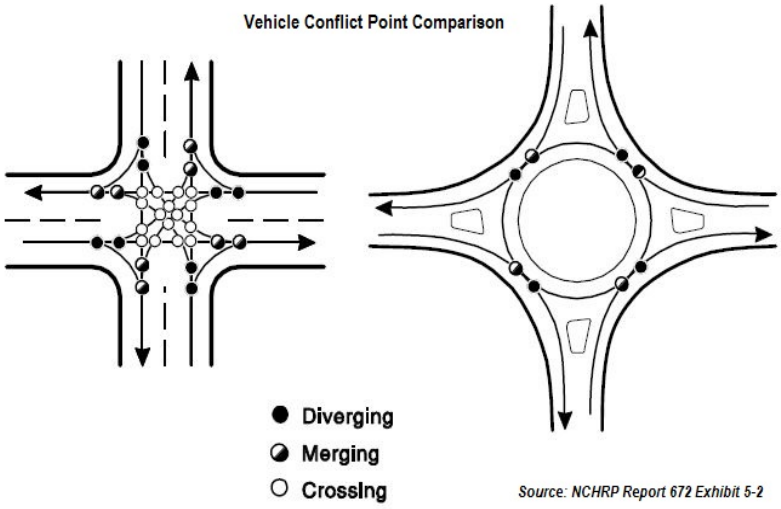
ROUNDABOUT



Source: NCHRP Report 672 Exhibit 5-2

13

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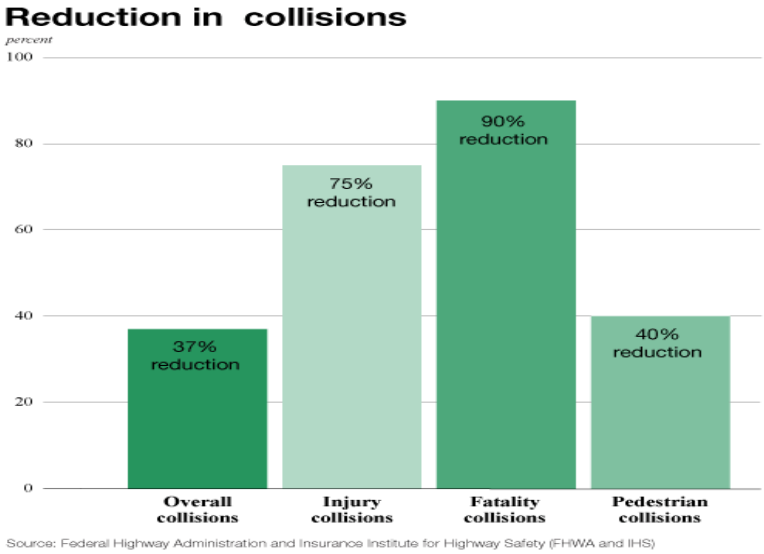
ROUNDABOUT STATS



Source: Federal Highway Administration and Insurance Institute for Highway Safety (FHWA and IHS)

14

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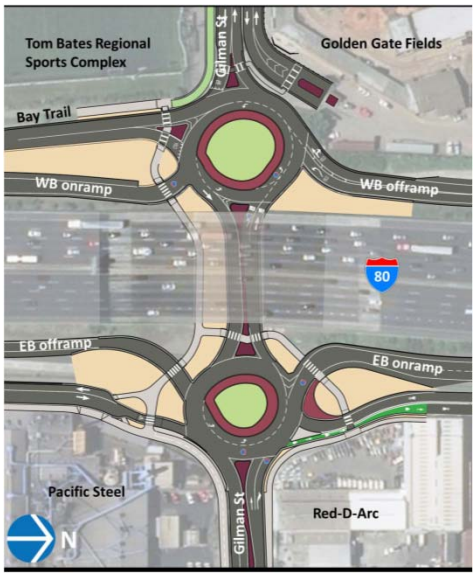
SIMILAR ROUNDABOUT IMPLEMENTATION



15

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VA ALTERNATIVE 1.1

16

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ADDITIONAL PROPOSED ALTERNATIVE 1.1

1. Large single oval roundabout with existing interchange travels;
2. Advantages of this type of roundabout include:
   a. Spreads out closely spaced legs at south end of roundabout;
   b. Improved stage construction with less construction time; and
   c. 2nd best reduction in R/W impacts and least at north end
3. Challenges involve:
   a. High density of exit/entry points at south end;
   b. Entry/exit angle design challenges; and
   c. High volume of motorists in the circulating roadway.

17

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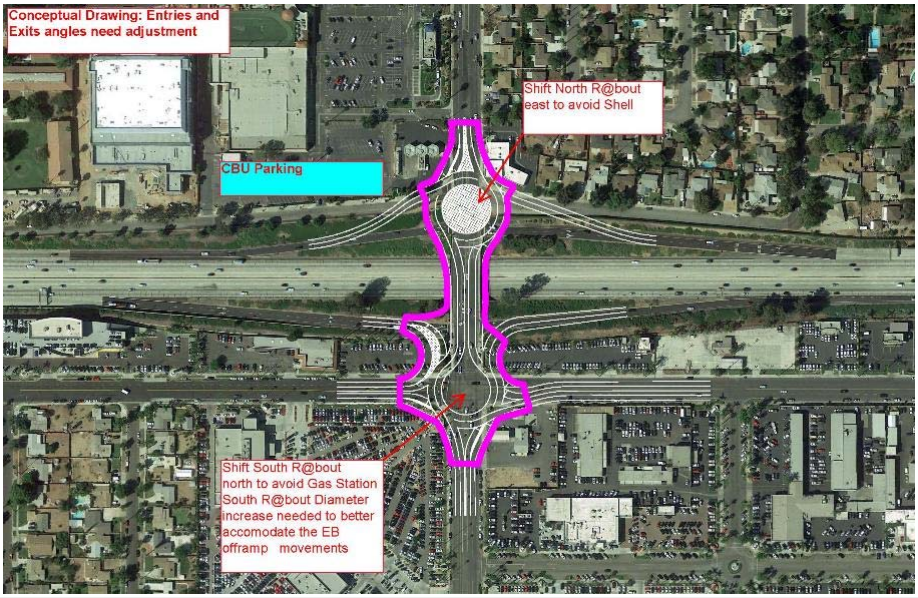
VA ALTERNATIVE 1.2



18

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ADDITIONAL PROPOSED ALTERNATIVE 1.2

1. Semi-dog bone roundabout with existing interchange travels;
2. The advantage of this type of roundabout is its ability to provide independent navigation of the north roundabout;
3. Challenges involve:
   a. High volume of motorists in the circulating roadway; and
   b. Potential for increased speeds within the intersection due to the longer straightaway.

VA ALTERNATIVE 1.3

ADDITIONAL PROPOSED ALTERNATIVE 1.3

1. Both a north roundabout with a south "peanutbout" with existing interchange travels;
2. Advantages of this design include:
   a. Provides independent navigation of the north roundabout;
   b. Yields similar construction R/W impacts to Alt. 1.2; and
   c. The "peanutbout" extends space between legs favoring WB Indiana Ave traffic across Adams St with reduced path; and
3. Challenges are related to need for additional wayfinding and meeting driver expectation.

VA ALTERNATIVE 1.4

ADDITIONAL PROPOSED ALTERNATIVE 1.4

1. A north roundabout with continuous traffic flow, onsite storage, a south median U-turn, and existing interchange travels;
2. Advantages of this model include:
   a. Least R/W impacts particularly at Indiana / Adams Aves;
   b. Best condition for WB Indiana Ave / EB 91 on-ramp; and
   c. Greatest separation of interchange movements; and
3. Challenges include:
   a. U-turn may be difficult for auto trailers; and
   b. Additional wayfinding may be required and may not meet driver expectation.

PROJECT FUNDING

1. PSR-PDS Phase - City funded;
2. PA&ED Phase - STP-Local, TUMF, & Measure A funded;
3. PS&E Phase - Partially funded; and
4. R/W Acquisition, Construction Phase – Unfunded.

PROJECT CONSTRUCTION COST ESTIMATE

Element	Alternative 3 Offset Intersection	Alternative 7 Hook Ramps-East
Roadway	$27,500,000	$29,500,000
Structures	$25,300,000	$9,900,000
SUBTOTAL Construction	**$52,800,000**	**$39,400,000**
Right-of-Way	$8,500,000	$18,600,000
TOTAL Capital Outlay	**$61,300,000**	**$58,000,000**
Support—all PD phases	$10,600,000	$11,600,000
TOTAL Project Cost	**$71,900,000**	**$69,600,000**

- PSR-PDS level Project Planning Cost Estimates
- 2018 data
- No escalation to construction year

25

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ALTERNATIVE COST ESTIMATE

Alternative 1.1 – Oval Roundabout	$32,991,000
Alternative 1.2 – Semi-dog bone Roundabout	$37,453,000
Alternative 1.3 – Peanutbout	$37,453,000
Alternative 1.4 – Median U-turn	$32,591,000

- Planning Cost Estimates
- 2018 data
- No escalation to construction year

26

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RECOMMENDATIONS

That the Mobility and Infrastructure Committee:

1. Receive and File this report and update;

2. Recommend that the City Council continue supporting the Adams St at SR-91 Interchange Project; and

3. Provide feedback on the Oval Roundabout concept design, Alternative 1.1. Caltrans and the City may seek additional technical analysis on this alternative.