North State Street – US Hwy 101 Intersection/Interchange Alternatives Analysis

Public Outreach Meeting

November 13, 2019

Project Location

Level of Service

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Lake Mendocino Dr & N State St	Signal	C	19.5	B	-	12.2	B	-
2	Hensley Creek Rd & N State St	SSSC	C	19.7	C	-	14.3	B	-
3	**Olive Ave & N State St**	**TWSC**	**C**	**48.5**	**E**	**No**	**32.2**	**D**	**No**
4	**Kunzler Ranch Rd & N State St**	**TWSC**	**C**	**114.7**	**F**	**No**	**80.6**	**F**	**Yes**
5	**Orr Springs Rd & N State St**	**TWSC**	**C**	**26.1**	**D**	**No**	19.6	C	-
6	**US 101 NB Ramps & N State St**	**TWSC**	**C**	**109.1**	**F**	**Yes**	**32.8**	**D**	**Yes**
7	**US 101 SB Off Ramp & N State St**	**TWSC**	**C**	**158.5**	**F**	**Yes**	**28.6**	**D**	**Yes**
8	US 101 SB On Ramp & N State St	TWSC	C	4.1	A	-	6.4	A	-
9	Kuki Ln & N State St	Signal	C	14.4	B	-	26.6	C	-
10	**Empire Dr/Ford Rd & N State St**	**Signal**	**C**	**46.8**	**D**	**-**	**37.7**	**D**	**-**
11	Ford Rd & Masonite Rd	TWSC	C	5.7	A	-	5.1	A	-
12	Low Gap Rd/Brush St & N State St	Signal	C	8.7	A	-	8.7	A	-
13	Brush St & Orchard Ave	TWSC	C	10.5	B	-	10.6	B	-
14	Ford St & N State St	TWSC	C	18.2	C	-	21.1	C	-
15	Ford St & N Orchard Ave	TWSC	C	9.7	A	-	9.8	A	-
16	Kuki Ln & Lovers Ln	TWSC	C	15.7	C	-	11.1	B	-

Notes:
1. SSSC = Side Street Stop Control
2.TWSC = Two Way Stop Control
3. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
4. Warrant = Based on California MUTCD Warrant 3

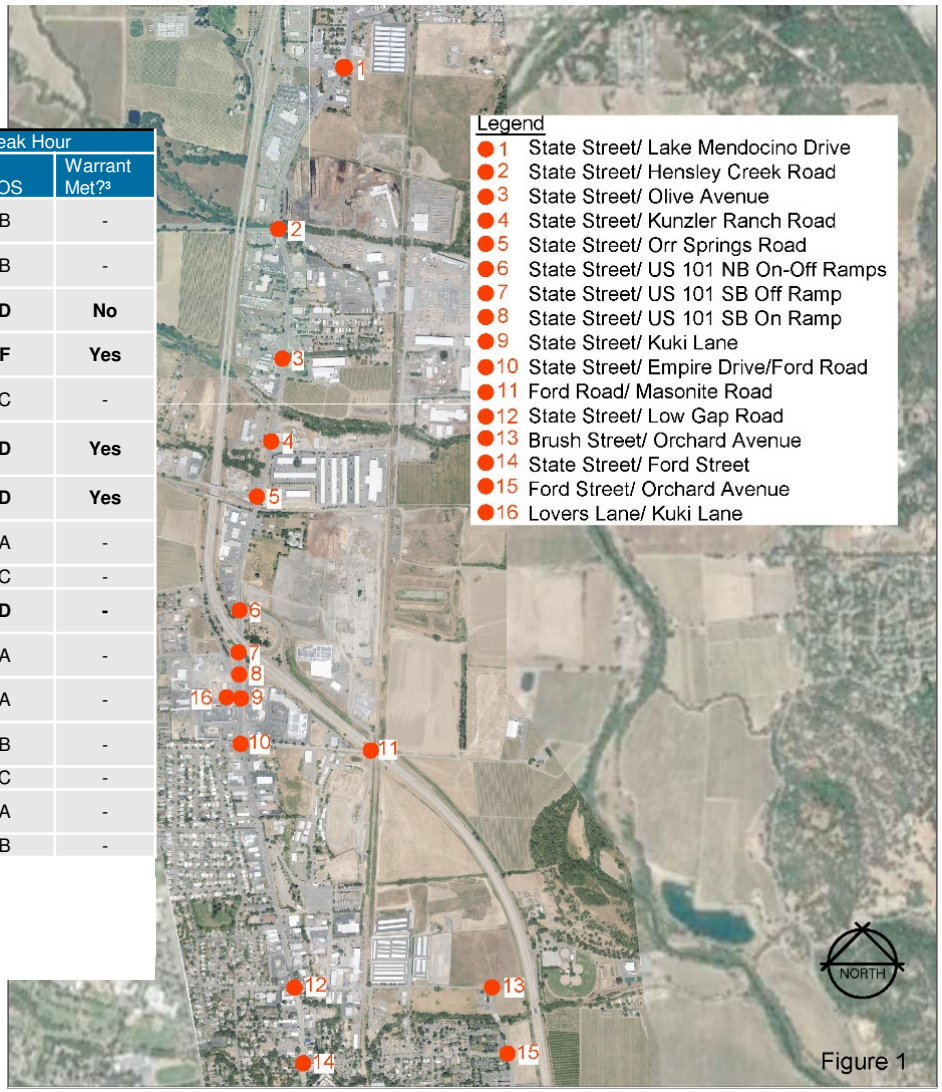


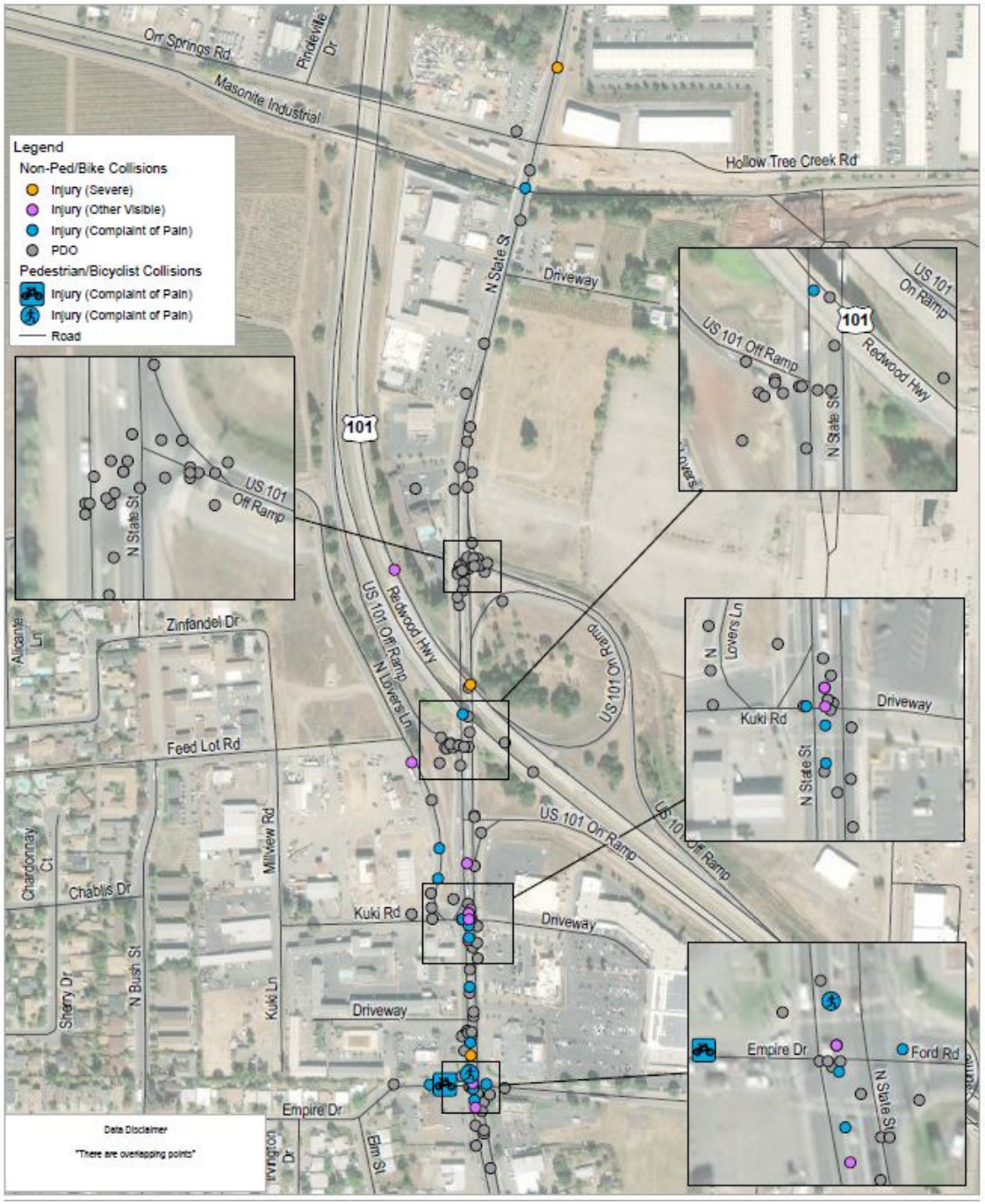
Figure 1

Level of Service

Traffic Operations will Deteriorate to Level of Service "D" or "F" along Corridor Without Improvement

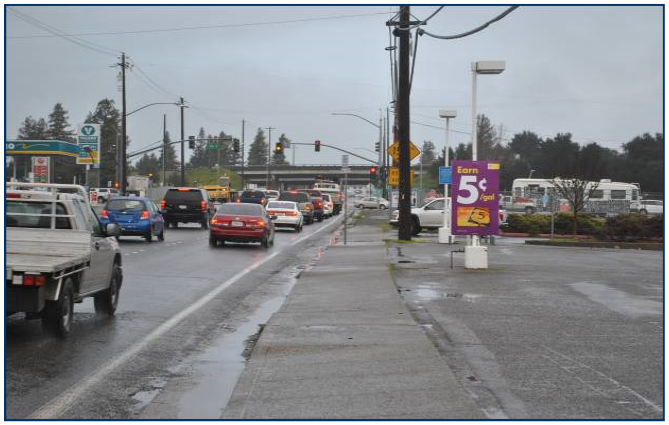
Collision Summary

- 2014 to 2018
- 3 Mile Corridor
- 167 Collisions
- Mostly Rear End (40.7%) and Broadside (26.9%)
- 14 Vehicle/Ped (8.4%)
- **3 Fatalities**
- **18 Severe Injuries**



Purpose/Need

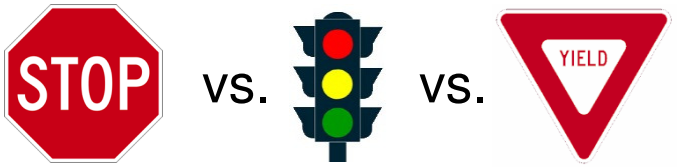
- Relieve Traffic Congestion
- Improve Traffic Safety
- Minimize Delay
- Improve Pedestrian and Bicycle Access
- Enhance Economic Vitality
- Facilitate Goods Movement



Intersection Control Evaluation (ICE)

An Important Design Decision Tool

Side by side comparison of intersection control strategies

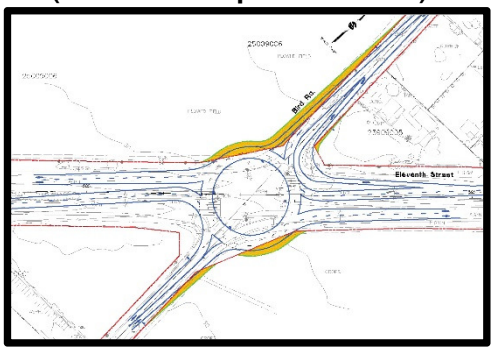


ALSO used as a side by side comparison of similar control strategies

Evaluation is documented for use in:

Public Outreach

Potential Challenges to the Project (R/W acquisitions)

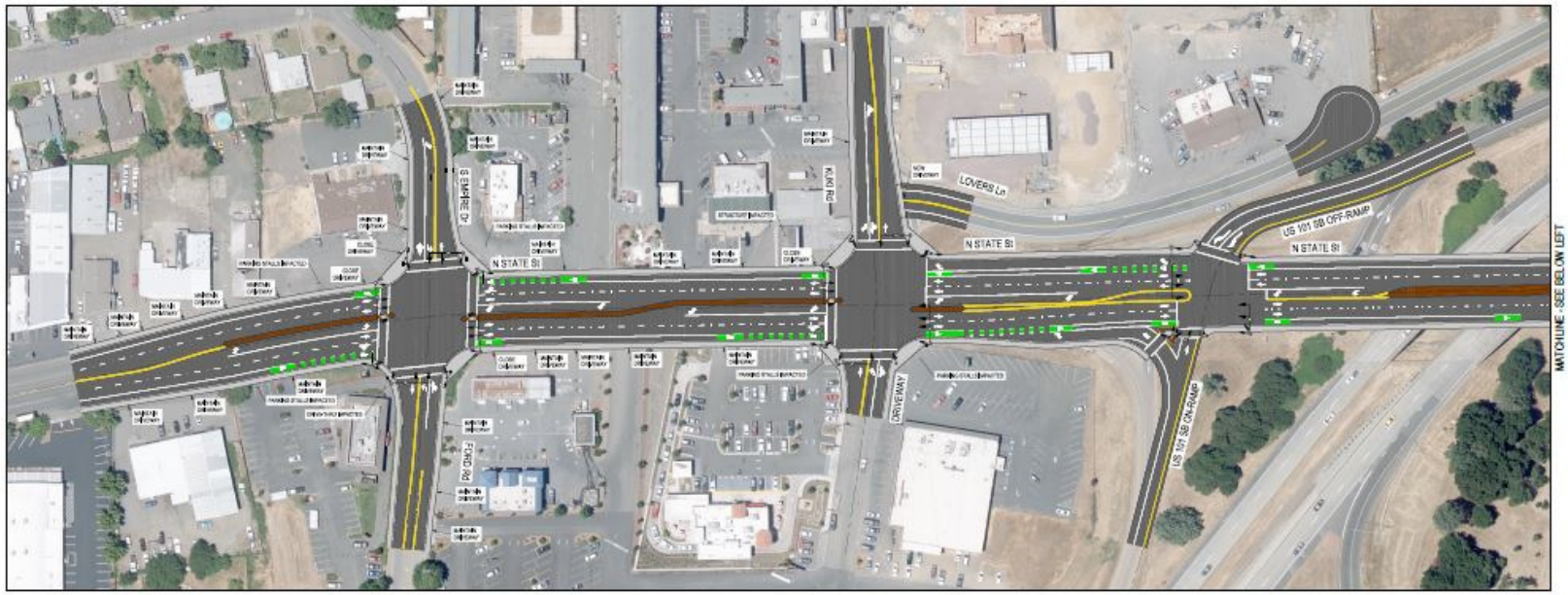


End result leads to a **Single Alternative**

Evaluated Intersections

Signal Build Alternative

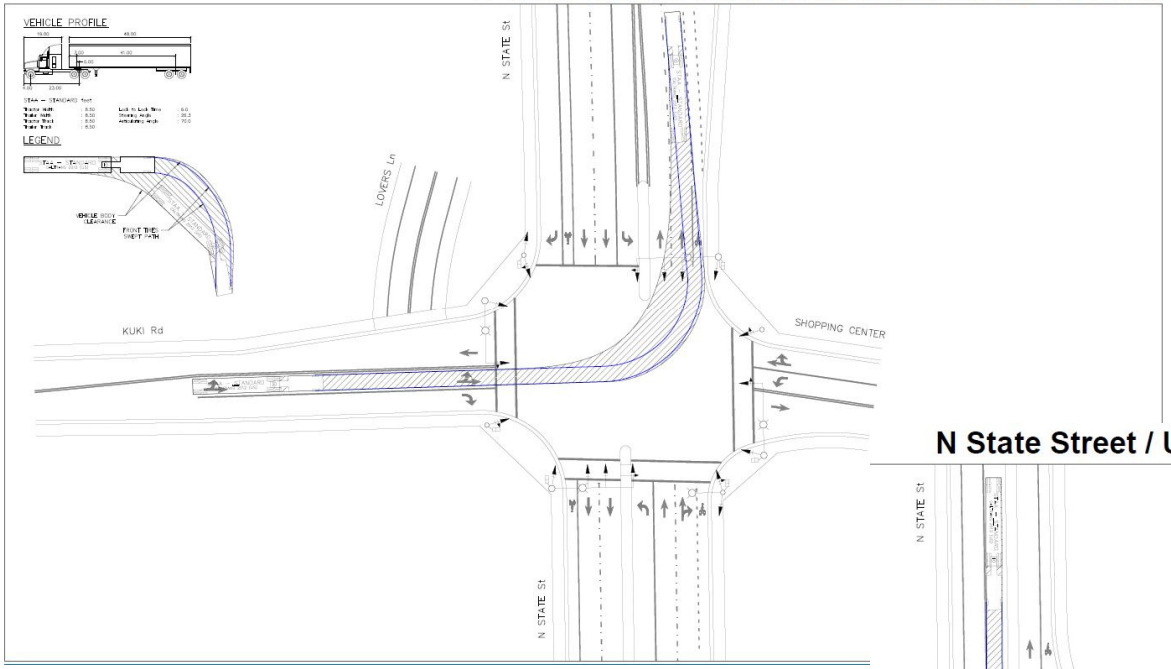
Signal Alternative – Southern Intersections



Signal Alternative – Northern Intersections

Signal - Truck Accommodations

N State Street / Kuki Road Truck Turns - EB Left



N State Street / US 101 On/Off Ramps Truck Turns - SB Left

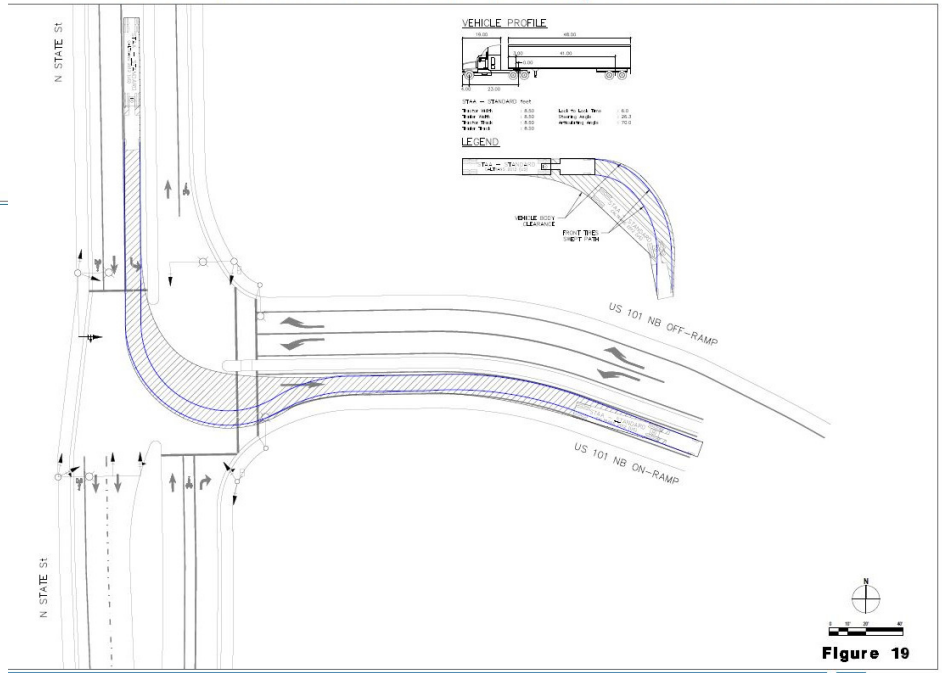


Figure 19

A **“Complete Street”** goal is to be safe, comfortable and convenient **<u>for all users</u>** – pedestrians, bicyclists, motorists and transit riders of all ages and abilities.

Why Modern Roundabouts?

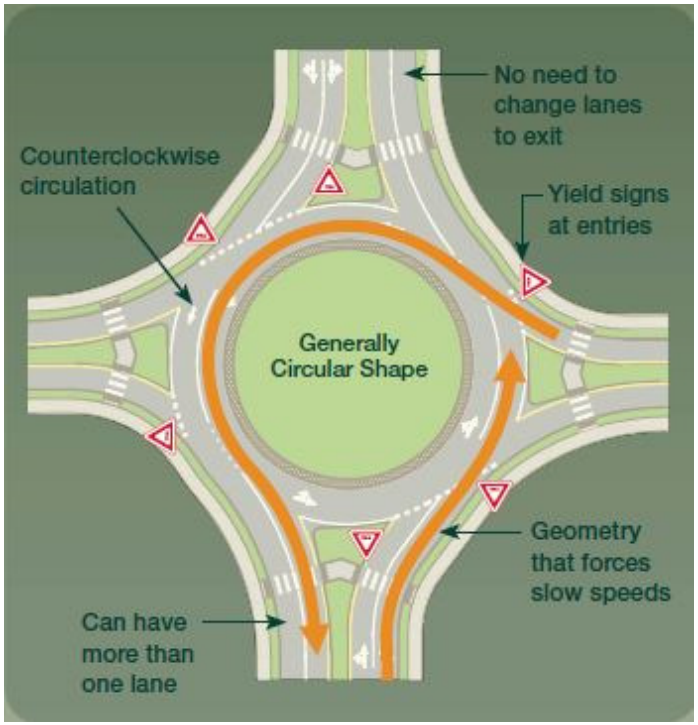
Improve Safety for ALL modes

Reduce Congestion

Reduce Pollution and Fuel Use

Save Money

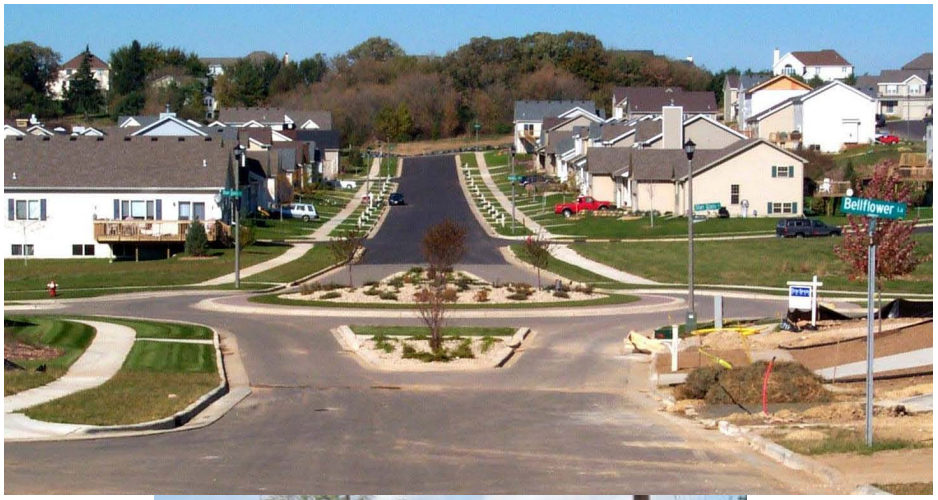
Modern Roundabout



Source: Roundabouts : An Informational Guide.
FHWA

What <u>Are NOT</u> Modern Roundabouts?

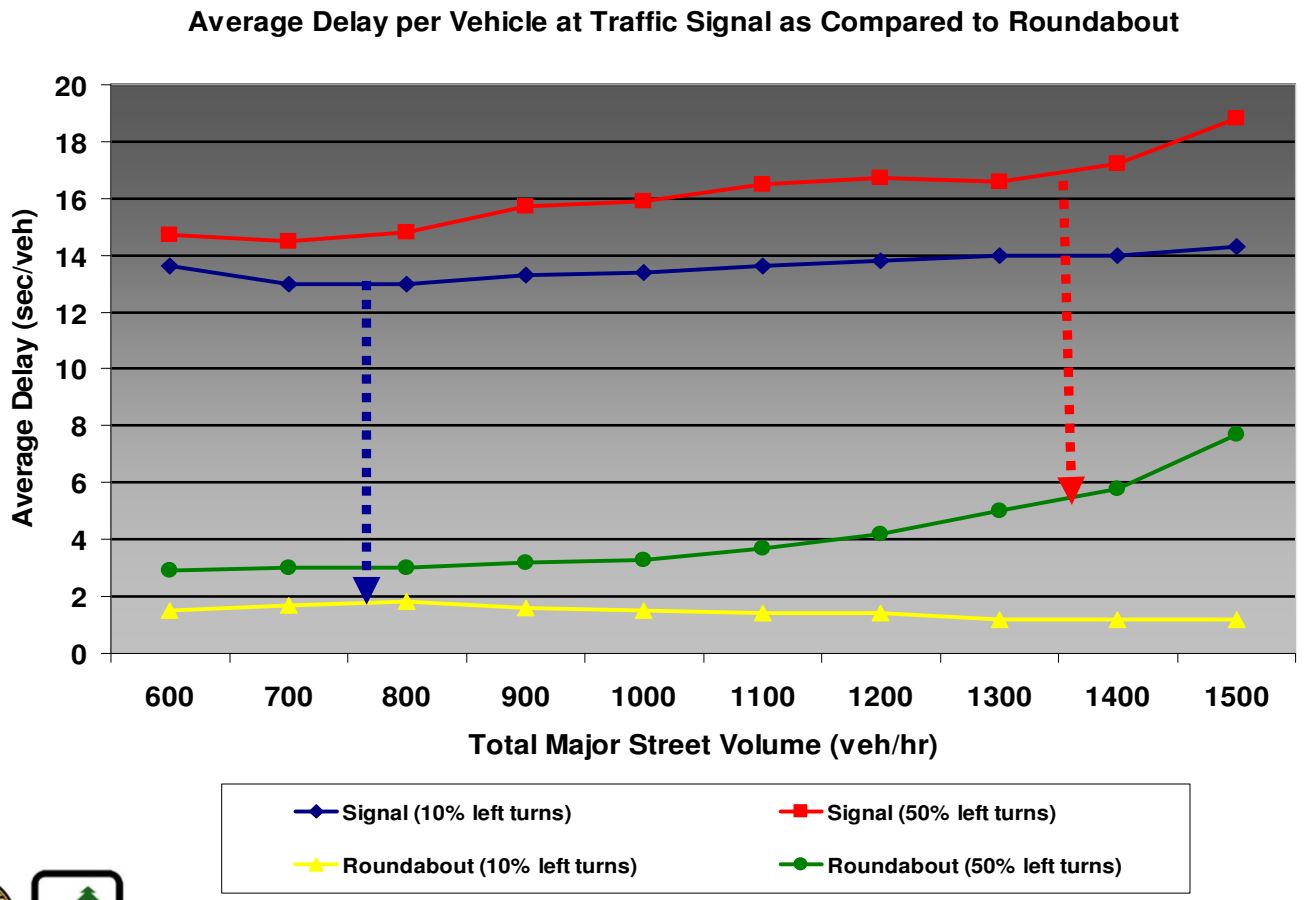
Rotaries



Traffic Calming Circles

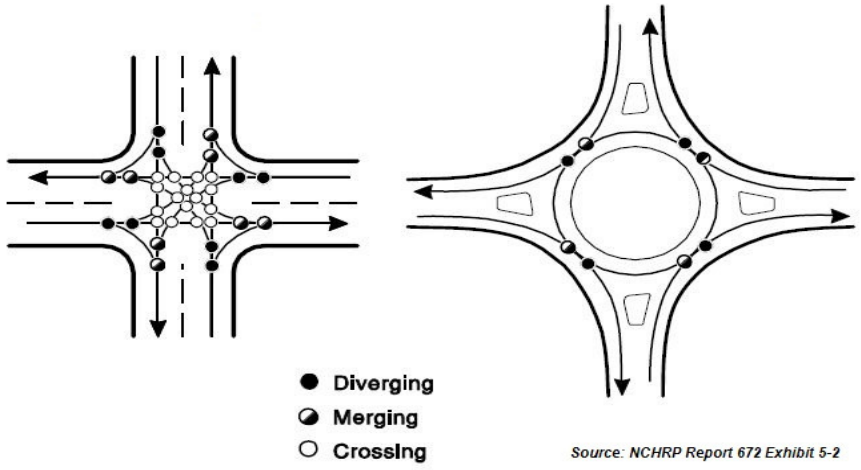
Why Roundabouts?

Increased Capacity & Reduced Delay



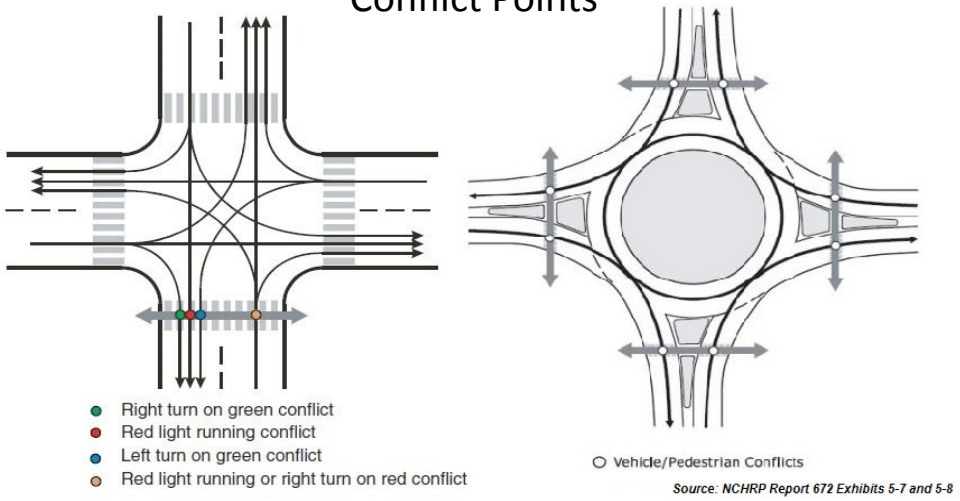
Roundabout Safety Overview

Vehicle
Conflict Points



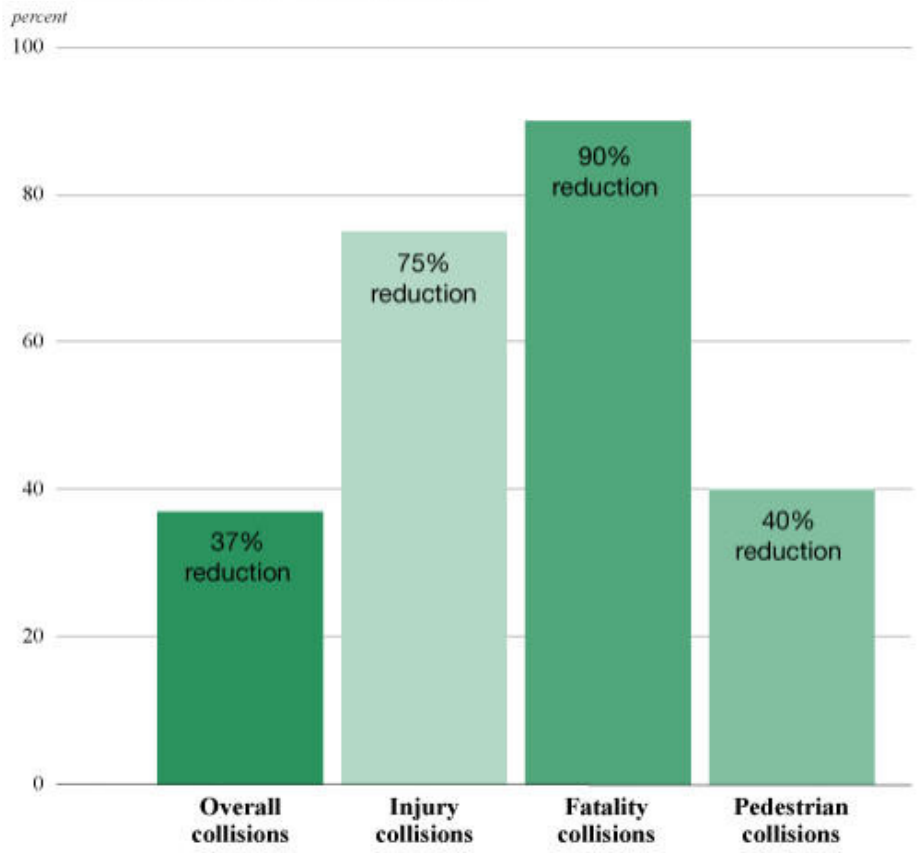
Source: National Cooperative Highway Research Program
Report 672 Exhibit 5-2

Pedestrian
Conflict Points



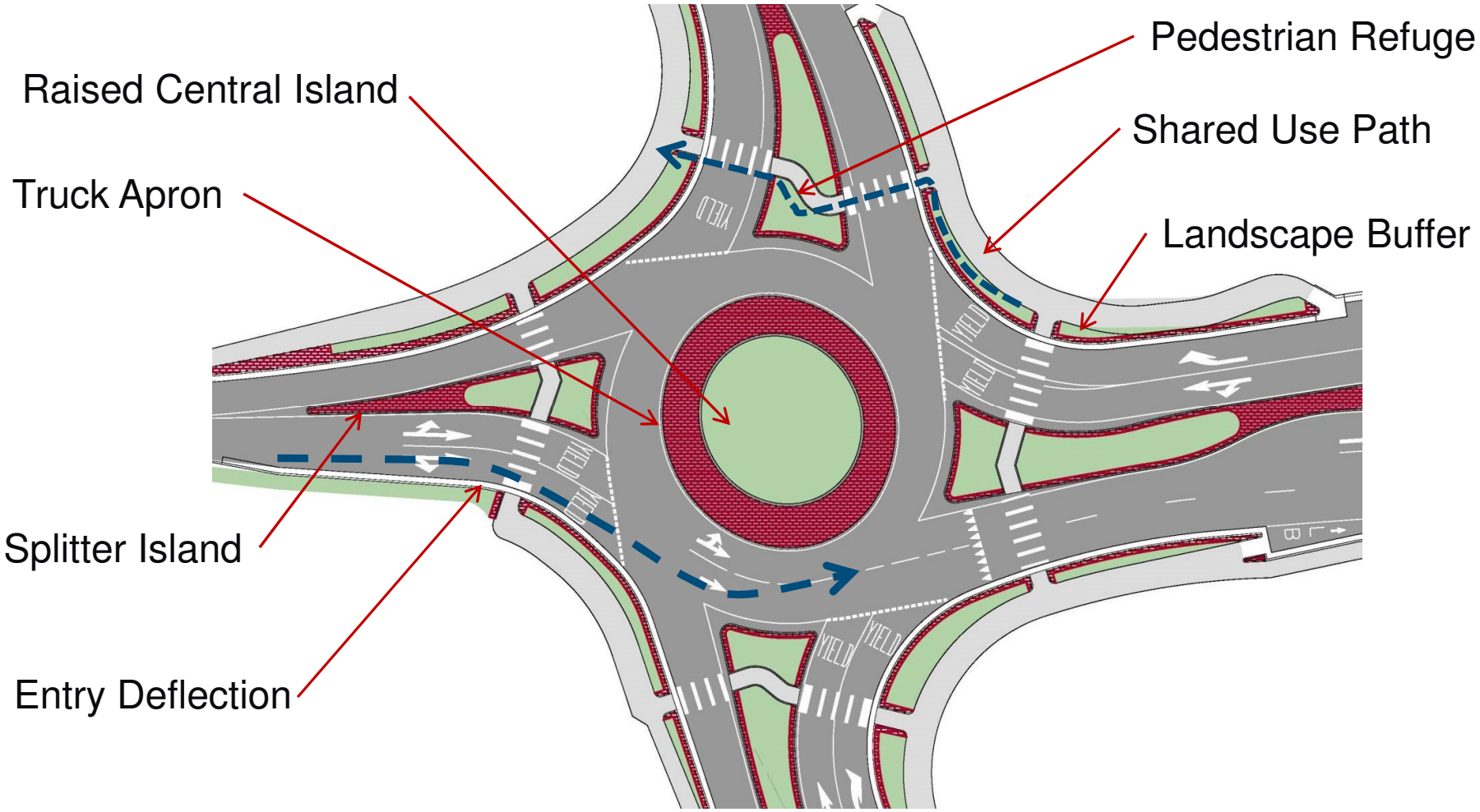
Source: National Cooperative Highway Research
Program
Report 672 Exhibit 5-7/8

Crash Reductions

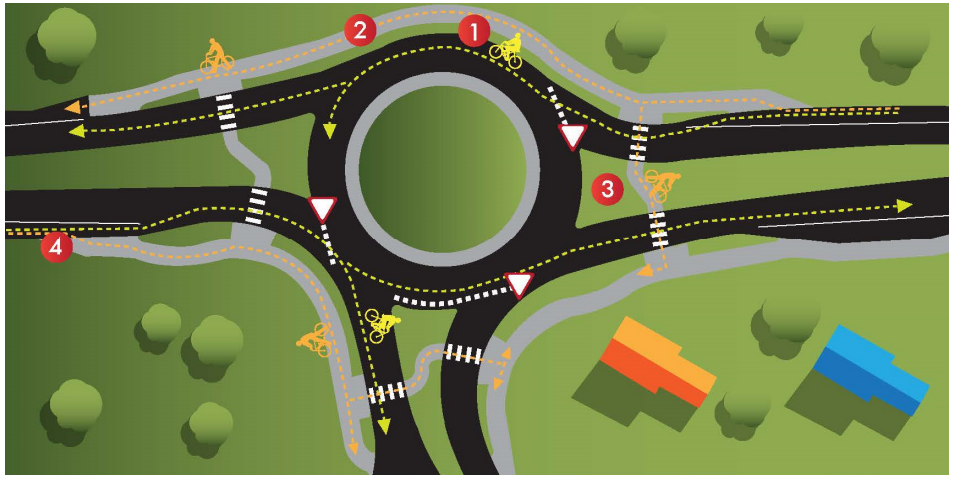


Source: Federal Highway Administration and Insurance Institute for Highway Safety (FHWA and IHS)

Design Elements of a Modern Roundabout



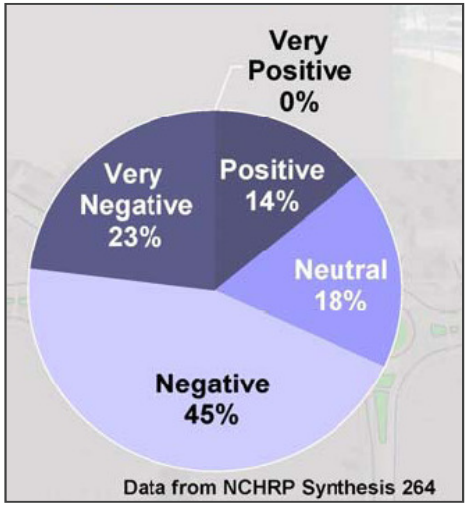
Bicycle Movements



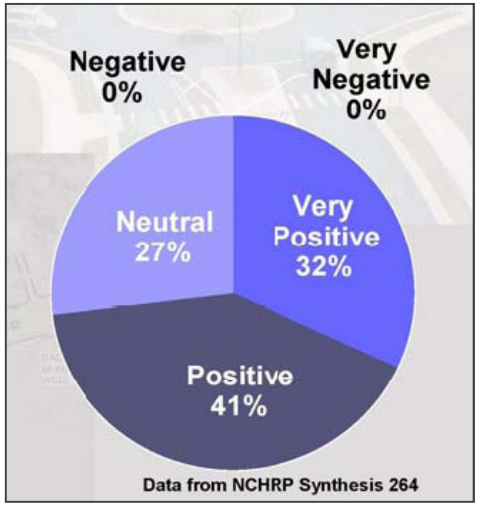
1. Experienced Riders travel as a vehicle
2. Novice Riders use Shared Path
3. Pedestrian Refuges are wide enough to shelter bicyclists
4. Enter and Exit Shared Path from bike ramps located away from the intersection

Public Opinion of Roundabouts

Before Roundabout Installation

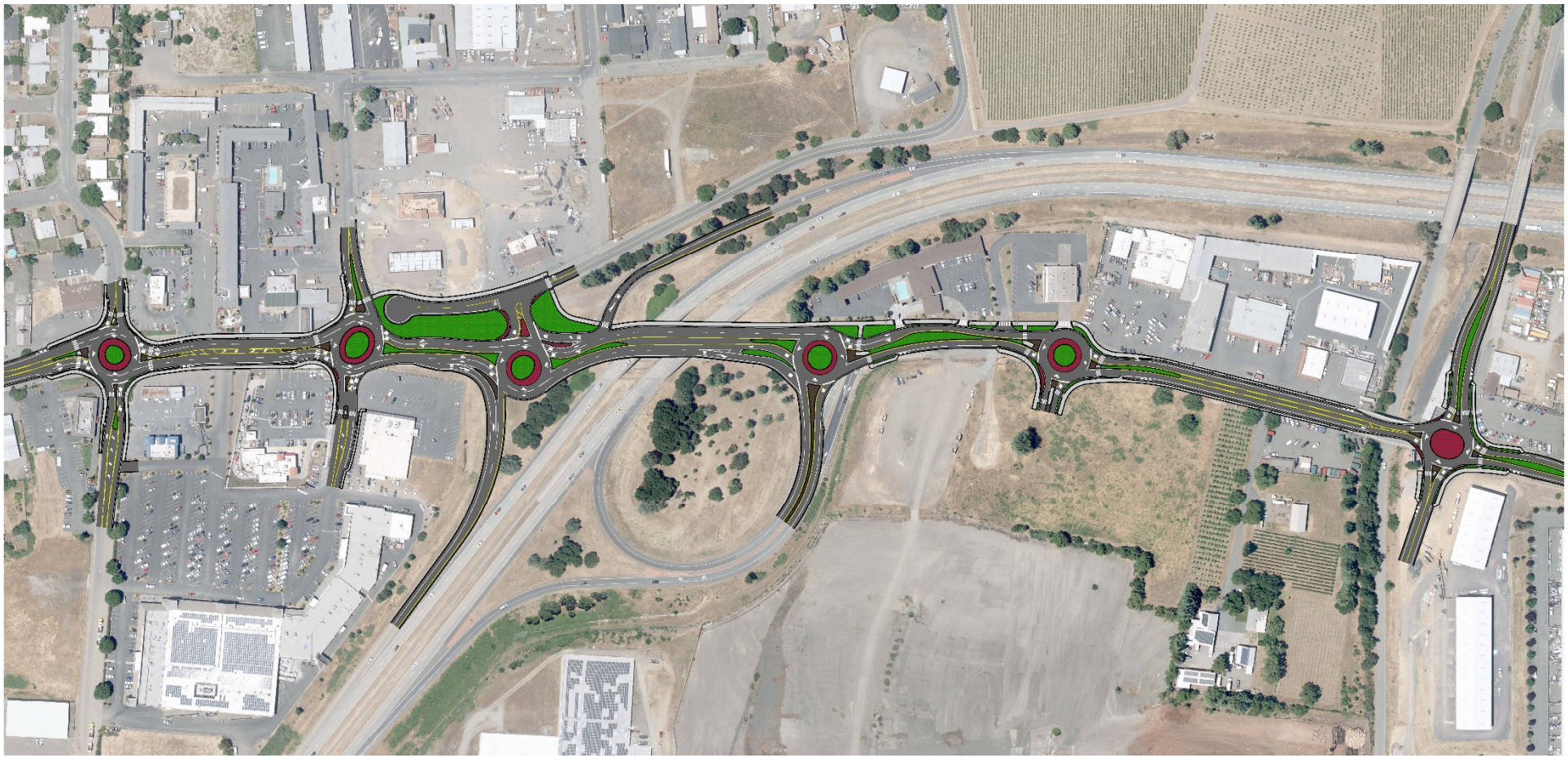


After Roundabout Installation



Public Perception Changed from 68% Negative to *73% Positive* after Installation

Roundabout Build Alternative

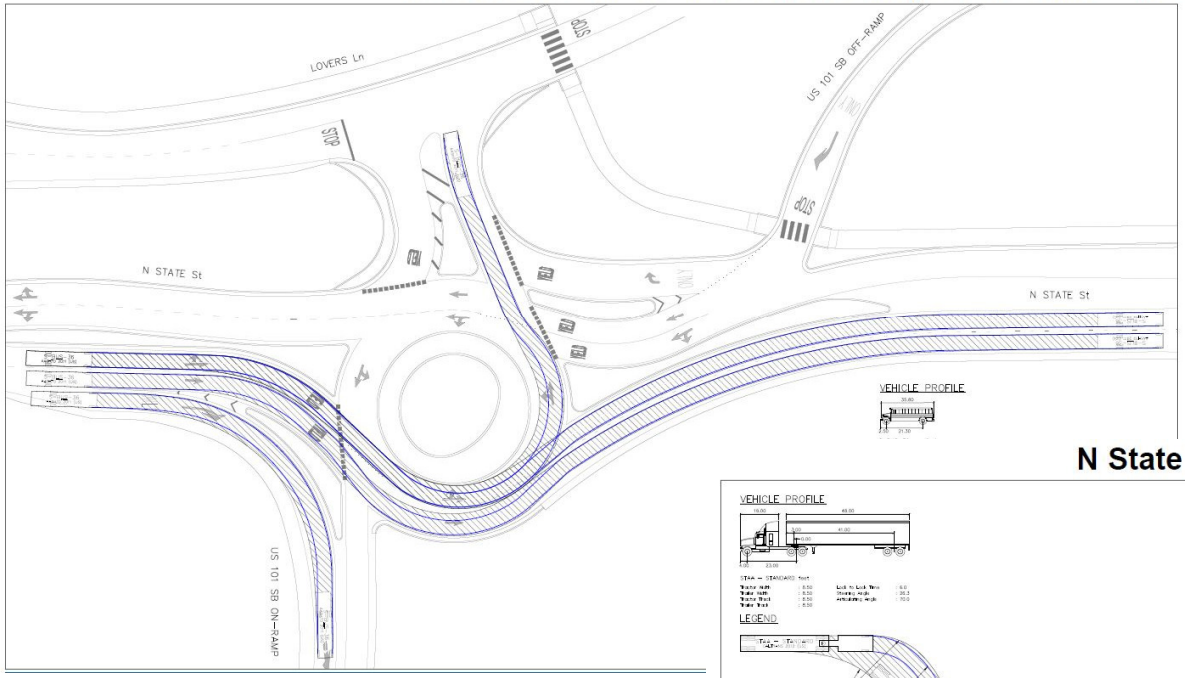


Roundabout Alternative – Southern Intersections

Roundabout Alternative – Northern Intersections

Roundabout - Bus/Truck Accommodations

N State Street / US 101 On/Off Ramps Bus Turns - NB



N State Street / Kuki Road Truck Turns - SB Left & Right

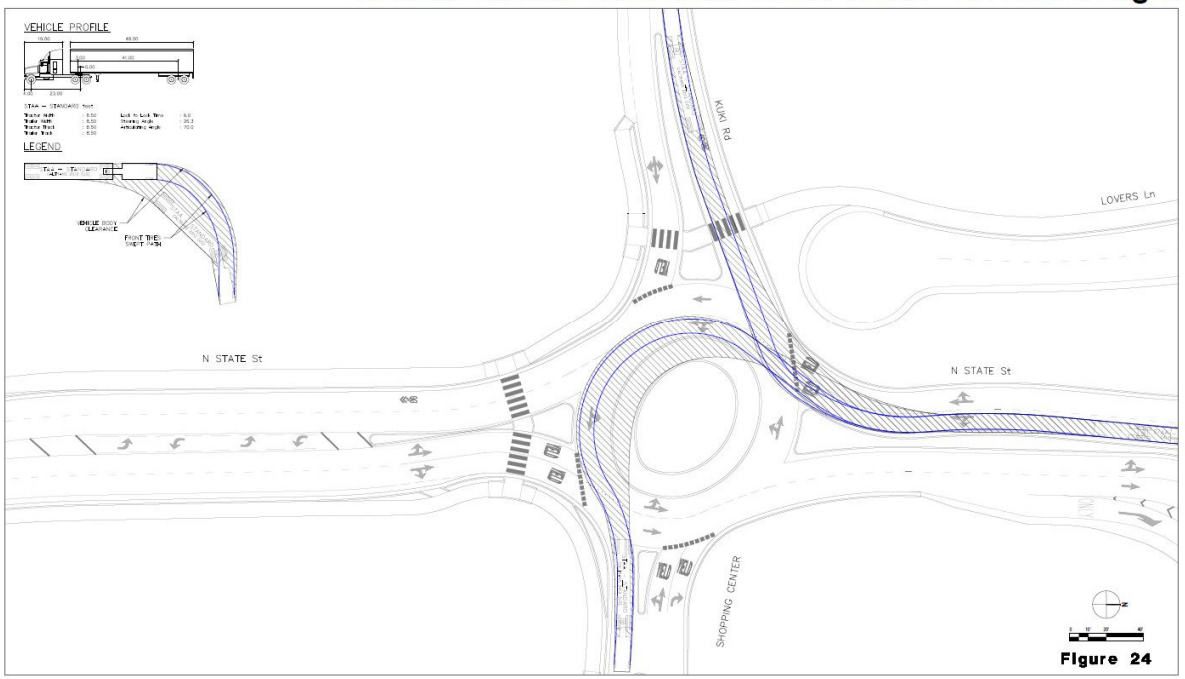


Figure 24

Evaluated Intersections

ICE Alternative Evaluation

Metric	Traffic Signal						Roundabout					
	1	2	3	4	5	6	1	2	3	4	5	6
Cost	✓	✓	✓	½	✗	✗	✗	✗	✗	½	✓	✓
Complete Streets	✗	✗	✗	½	½	½	✓	✓	✓	✓	✓	✓
Safety	½	½	½	½	½	½	✓	✓	✓	✓	✓	✓
Design Challenges	✓	✓	✓	½	½	✗	½	½	✗	✓	✓	✓
Environmental Impacts	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
Reduce Right of Way Impacts	✗	✗	✓	½	✗	✗	½	½	✓	½	½	✓
Constructability	½	½	½	½	½	✗	½	½	½	✓	½	✓

Legend:

✗ Doesn't Meet Metric As Well

½ Semi Meets Metric

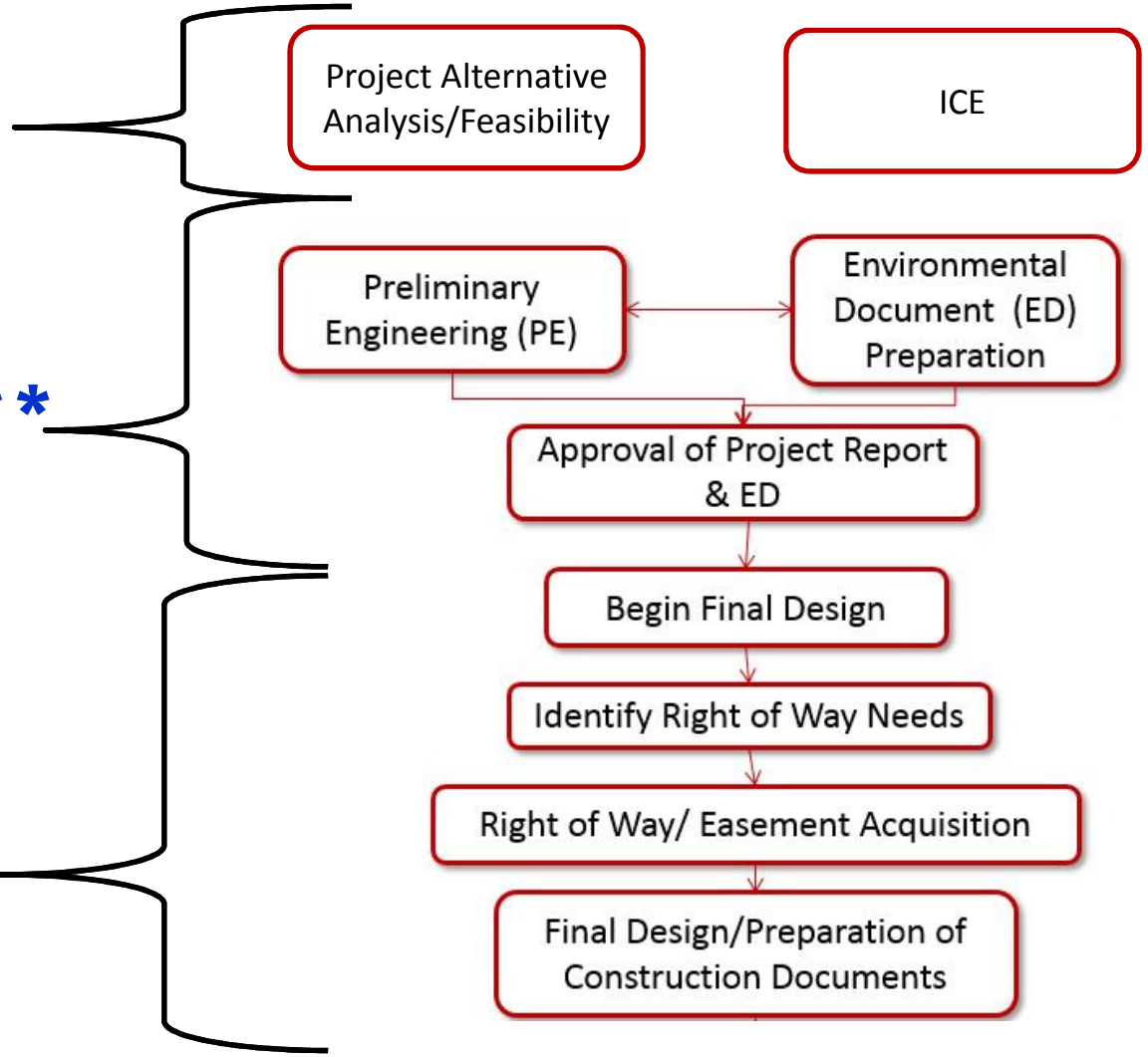
✓ Meets Metric

Project Delivery Outline

Current Phase

Next Phase**

Ultimate Goal



**Funding for PA&ED programmed for KUKI and 101 Interchange intersections starting 2020/21

Questions?

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