I-5 / La Novia Roundabout

- 1st Caltrans District 12 ICE Approval
- 1st Roundabout Construction in District 12
- 1st Roundabout in City of San Juan Capistrano
- Challenges and Lessons Learned
Project Location
Existing Conditions

- Off-set stop controlled intersection
- Steep 11% grade on La Novia
- Hillside conditions
- Close proximity to I-5
- Existing Level of Service (LOS) “F”
Alternative Improvement Concepts

- Alternative 1: I-5 Ramp Realignment and Signalize
- Alternative 2: Signalize Existing Off-set Intersection
- Alternative 3: Realign La Novia Avenue and Signalize
- Alternative 4: Roundabout Intersection
## Alternatives Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>Alternative 2</th>
<th>Alternative 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Volume Level of Service</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>PM Delay (seconds per vehicle)</td>
<td>29</td>
<td>10</td>
</tr>
<tr>
<td>2035 Volume Level of Service</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>PM Delay (seconds per vehicle)</td>
<td>47</td>
<td>24</td>
</tr>
<tr>
<td>Right-of-way Requirement</td>
<td>None</td>
<td>40 sq ft</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>$940,000</td>
<td>$1,700,000</td>
</tr>
</tbody>
</table>

- Roundabout alternative provides safety attributes which have been documented to be superior to signalized alternative
Planning Commission Questions and Concerns

- Driver understanding of roundabout operations
- A “yield controlled” intersection versus a “signal controlled” intersection
- The overall safety of the roundabout alternative due to the public unfamiliarity
- The potential for back-ups onto I-5
- The differences in grade at this location
- The ability for large “car carrier-type” trucks to negotiate a roundabout
- Pedestrian access and safety
Modern Roundabouts: Intersections Designed for Safety

San Juan Capistrano, CA ▪ June 3, 2014

Hillary Isebrands, PE, PhD

Federal Highway Administration
Resource Center, Safety & Design Technical Service Team
hillary.isbrandis@dot.gov

Source of Images: Google Earth
Intersection Safety Facts

- About half of all severe crashes occur at intersections
- Angle crashes account for over 40% of fatal crashes at intersections
- Left turn crashes account for over 20% of fatal crashes at intersections
- Ped/Bike crashes account for 25% of fatal crashes at signalized intersections

Source: Isebrands, FHWA
Roundabout Safety Experience

- 35% Reduction in All Crashes
- 76% Reduction in Injury/Fatal Crashes
- 89% Reduction in Injury/Fatal Crashes in Rural Environments

Source: NCHRP 572 (2007); Isebrands TRR 2096, 2009; Isebrands Dissertation 2011
Roundabout Safety

- Fatal and injury crashes reduced significantly
- The number of conflict points is ¼ of traditional intersection
- Changes in the types of crashes
- Slow speeds for all vehicles
Slow Speeds for All Vehicles

Vehicle traveling at 20 MPH
9 out of 10 pedestrians survive.

Vehicle traveling at 30 MPH
5 out of 10 pedestrians survive.

Vehicle traveling at 40 MPH
1 out of 10 pedestrians survive.

Source of Images: Seattle DOT
Bikes at Modern Roundabouts
Large Vehicles

Source: City of Richfield, MN
Roundabouts with Steep Grades
"The City of Grass Valley worked with Caltrans to develop a roundabout improvement project that was completed in 2008. The project has been very successful and operates well. Public information outreach was very important in informing our community of the how the roundabout would work and facilitate the movement of car and truck traffic."

Tim Kiser, PE
Public Works Director/City Engineer
Grass Valley, California
I-5 / La Novia Interchange

Construction Activities Update

Residential Community Information Meeting

Monday, November 23, 2015
5:30 to 7:00 pm
Saint Margaret’s Episcopal School
Sillers Hall, 31641 La Novia Avenue
San Juan Capistrano, CA
Construction Activities Update

- October 2015 - City Council Adoption of Environmental Document
- November – January - Finalize Construction Plans
- Spring 2016 - Begin Construction
- Winter 2016 - Complete Construction
- Valle Road - Open Throughout Construction
- Two Short Term Ramp Closures
- Future City Website Updates
Stage 1 – 4 Weeks

Temporary Ramp and Valle Road Realignment
Stage 2 – 2 Weeks  Ramp Closure
Detour for Off-Ramp Closure
Detour for On-Ramp Closure
Stage 3 – 1 Week    La Novia Closure

- Stage 3 Construction
- Stage 2 Construction
- Open to Traffic
Detour for La Novia Closure
Stage 4 – 16 Weeks

Stage 4 Construction
Open to Traffic
Stage 5 – 3 Weeks

Stage 5 Construction
Stage 4 Construction
Open to Traffic
Stage 6 – 2 Weeks Ramp Closures

- Stage 6 Construction
- Ramps Closed
- Valle and La Novia Open
Stage 7 – 2 Weeks

- **Removals**
- **Roundabout Open**