



*Motorists entering or exiting Interstate 5 in San Juan Capistrano at Exit 82 now have a much smoother path with the completion of the I-5/La Novia Roundabout that replaced a challenging intersection. Caltrans District 12 worked with regional partners and a residential developer on the project.*

## Answer to Traffic Woes Comes Full Circle

### First Roundabout in O.C. Connecting to I-5 Improves Safety for Road Users

Orange County's first traffic roundabout linking to the State Highway System transformed a challenging access point to Interstate 5 in the city of San Juan Capistrano. The new roundabout is safer and much more efficient in keeping traffic moving.

Prior to 2017, drivers entering or getting off the freeway at Exit 82 for San Juan Creek Road had to contend with an intersection at Valle Road and La Novia Avenue where five road segments came together. The five-leg intersection featured a challenging geometry with poor sight lines and awkward turning movements for drivers. In addition, the lack of traffic signals contributed to both congestion and directional confusion.

A new housing development provided the impetus for a solution. A team from Caltrans' Orange County-based District 12, along with the residential developers, the city of San Juan Capistrano, a design firm, and the prime contractor, came together to develop a traffic intersection control alternative.

The team offered four alternatives to improve existing conditions on how best to redesign the intersection for optimum traffic flow and safety.

Working with city staff, District 12 staff joined with the Federal Highway Administration to use a new Intersection Control Evaluation method to screen alternatives and identify

the best geometric and traffic control solution for the problematic intersection.

Following eight months of analysis, a roundabout intersection was selected as the preferred alternative. Compared with other options, the roundabout required the least right-of-way acquisition and had the highest benefit-to-cost ratio. It also cost the least to construct and maintain, and brought safety advantages over signalized intersections.

Due to the novelty of a roundabout in Orange County, demonstrating its benefits to the community was essential to gaining support. A series of presentations on roundabouts was made at city meetings and public information sessions. Following a growth in public support, the San Juan Capistrano City Council approved the new intersection.

Construction began in June 2016. The design consists of a landscaped center median, a circulating roadway with a width of 20 feet, and single lane approaches on Valle Road, La Novia Avenue and the I-5 entrance and exit ramps. The steep grade on La Novia, hillside conditions in the area, and proximity of the intersection to the freeway increased the difficulty level of the work.

A major challenge of this project involved keeping the busy intersection open to traffic during construction. An eight-

## Project Spotlight



stage construction staging/traffic handling plan was prepared, which called for temporary ramp closures, city street closures and detour maps. Construction updates were given on the city's websites.

Ten months after construction began, the \$1.6 million roundabout opened to traffic in April 2017. San Juan Capistrano arranged for funding from the developer.

Roundabouts are a significantly safer type of intersection, according to the Federal Highway Administration, because the design reduces the number and severity of conflict points where motorists, bicyclists or pedestrians may collide. A conventional intersection has 32 conflict points — eight merging (or joining), eight diverging (or separating) and 16

crossing, said the National Cooperative Highway Research Program (NCHRP). An equivalent roundabout only has eight conflict points — four merging and four diverging.

Not only are conflict points reduced with a roundabout, the type of conflicts that remain are the same-direction variety, which result in substantially less severity, and, accordingly, less likelihood of injury, the NCHRP concluded.

By eliminating the offset, stop-controlled intersection, drivers enter the roundabout with the knowledge that they must yield to the vehicle in the circle that has the right of way. Once in the intersection circle, motorists can choose their exit and continue to their destination.

The project improves overall air quality, since fewer cars are idling at stop signs. It enhances community aesthetics, and provides new paths of travel within San Juan Capistrano, giving residents alternative access to downtown and other parts of the city.

The first State Highway System roundabout in Orange County was an excellent example of how State, local and federal partners can work together to improve safety and mobility for Orange County residents and visitors.

The American Public Works Association, Southern California Chapter, recognized the project in 2017 as its Traffic, Mobility and Beautification Project of the Year. The Los Angeles chapter of the American Society of Civil Engineers honored the I-5/La Novia Roundabout as its Roadway and Highway Project of the Year in 2018. **MM**

**Source:** Justin Lesniewski, Lena Maiah, Elizabeth Manzo, Van Nyugen; District 12 Public Affairs staff



The roundabout project in San Juan Capistrano had to be completed in eight stages, with ramp closures, street closures, and detour maps prepared to alleviate traffic impacts on drivers. The work took 10 months, and the \$1.6 million roundabout opened to traffic in April 2017.