

EXECUTIVE SUMMARY

For several years, the California Department of Transportation (CALTRANS) has been planning and preparing to reconstruct the segment of Lake Murray/70th St. and Interstate 8 Interchange. Two proposed roundabouts will be located at each end of the bridge. This report includes the studies, design plans, and cost estimate for the Lake Murray Roundabouts project. The north intersection is located in the City of La Mesa and the south intersection is located in the city of San Diego. Throughout the planning and design process, Presidio's engineering staff have been coordinating with representatives from the City of La Mesa & City of San Diego regarding the project. It became evident that if the intersection was to remain under traffic signal control in the future it would no longer operate under an acceptable LOS. The redesign of the intersection would be needed in order to (a) meet current design standards; (b) improve traffic operations; and (c) maximize safety performance. While planning for the reconstruction project Presidio Design Consultants have determined that a roundabout will help ease the flow of traffic and improve the LOS.

A roundabout is a form of circular intersection in which traffic travels counterclockwise around a central island and entering traffic must yield to the circulating traffic. Roundabouts feature a central island, a circulatory roadway, and splitter islands on each approach with right of way priority given to circulatory traffic over incoming vehicles.

Studies and data from across the U.S. have consistently shown that roundabouts significantly reduce the number and severity of crashes, when compared to intersections controlled by traffic signals. This is especially true of severe crashes which result in serious injuries or death (for both motorists and pedestrians). Some of the main reasons for this safety benefit are: low travel speeds; elimination of the potential for head-on and "T-bone" crashes; and simplified decision-making for users. The vast majority of crashes that do occur at roundabouts are low speed "side swipes", with a low occurrence of injuries. The proposed roundabout layout has been designed to accommodate both existing and future (year 2020) traffic volumes during peak travel times. As part of the design process, traffic operations were carefully evaluated using AutoTurn software, a roundabout modeling program that has been successfully used to design thousands of roundabouts. Another way to evaluate the expected performance of the roundabout is to evaluate the traffic queue waiting to enter the intersection. A main factor contributing to the longer traffic signal queues is the short length of left turn lanes onto the freeway ramps, the left lane turn going southbound on Lake Murray onto Alvarado St. to take the Interstate-8 Eastbound (these left turn queues commonly resulted in a queue on the bridge). In addition, the longer queue resulted in the straight lane going northbound on 70th St. awaiting to take the Interstate-8 Westbound

Presidio Design Consultants have proposed a roundabout configuration with two lanes of traffic in each direction along 70th street for and one lane of traffic in each direction along Alvarado Road. For the north roundabout two lanes of traffic are provided along Lake Murray Boulevard and one lane of traffic in each direction for Wisconsin St. / Parkway Dr. The outside circle diameter for the North and South roundabout is 175 and 179 feet, respectively. The roundabout is designed to accommodate WB-40 trucks, create a low speed environment, and minimize impacts to adjacent properties. The Northern roundabout circle location has been shifted slightly to the northeast relative to the existing intersection. This was done to minimize impacts to developed properties in other quadrants of the intersection. Marked pedestrian crossings are planned for all four legs of the intersection. The roundabout has been designed in accordance with applicable standards and guidance from CALTRANS, FHWA, NCHRP.

Construction of the roundabout is planned for Spring of 2015. Presidio anticipates having additional meetings in the future to provide members of the public with information about the project, including construction-related items.

Sustainability

Typically roundabouts are more socially, economically, and environmentally sustainable than traditional signalized intersections. The average American spends 16 minutes a day idling their vehicle in driveways and intersections. Idling tailpipes spew out the same pollutants that form unhealthy smog and soot as those from moving cars. Nitrogen oxide, particulate matter, carbon monoxide, carbon dioxide and volatile organic compounds are the main health-harming pollutants in vehicle emissions. In addition to these emissions, the average vehicle burns about 1/5 to 7/10 gallons of gas per hour. Vehicle idling pollutes the environment wastes fuel and money. The Lake Murray Roundabouts project will have the dual benefit of save significant dollars for drivers and cutting down on harmful greenhouse gas emissions. From an operations standpoint roundabouts are cheaper to construct and maintain than costly signalized intersections. This is due to the fact that roundabouts do not require expensive electrical hardware and equipment to operate. A secondary benefit is roundabouts do not lose functionality in power outages which is both a safety and economic benefit. Studies have shown roundabouts significantly improve safety which also benefits the community both socially and economically. In some studies roundabouts have been shown to reduce total collisions by 39%, injury related crashes by up to 76%, and fatal crashes by up to 90%. Less collisions can lead to lower insurance premiums for drivers, reduced emergency medical cost, and lower intersection repair cost. All in all the Lake Murray Roundabouts will be a significantly more sustainable transportation mode for the communities of La Mesa and San Diego than the current signalized intersections.

Business Case

The Lake Murray Boulevard and 70th Street intersections act as multimodal transportation interchange that facilitate a high volume of cars, heavy trucks, and pedestrians. Constructing roundabouts on either side of the bridge creates an opportunity to improve the LOS of both intersections from failing to the current desired levels. Improving the LOS of each intersection will speed the flow of traffic. The freedom of travel and choices of lifestyle that Lake Murray and San Diego residents enjoy are made possible by an affordable, safe, and efficient transportation system. Having a network of highways, roads, trolleys, bicycle paths, sidewalks, and roundabouts within the region all contribute to the highest LOS for all users. Manufacturers rely on this network to access markets and to receive supplies. Businesses rely on it to conduct face-to-face meetings with customers and business associates. Employees rely on it to reach jobs, consumers rely on it to reach shopping destinations, and students use it to get to school. By improving the La Mesa and San Diego transportation system, the construction of the Lake Murray Roundabouts Interchange will enhance the competitiveness of regional business and expand economic opportunities for the community. Presidio Design Consultant's strives to provide the highest quality engineering services while focusing on cost efficiency and transparency. The Lake Murray Roundabouts project is estimated to cost approximately 6.9 million dollars and construction will occur over the span of one year. The cost estimate includes construction, labor, right of way acquirement, engineering service, and materials.

Social Impacts

The Lake Murray Roundabouts are designed to maximize LOS by increasing vehicular and pedestrian accessibility and mobility which will socially benefit the community. Transportation plays a critical role in developing the economy and strengthening the sociocultural fabric and is also critical for day-to-day subsistence. Community Cohesion is a focal point of the Lake Murray Roundabouts project and the roundabouts are designed to provide satisfaction, security, camaraderie, and identity to members of the community by increasing multimodal efficiency and safety for all transportation users. Presidio Design Consultants believes that due to the infrequency of roundabouts in San Diego, the Lake Murray Roundabouts project will become a source of pride and identity to the community.