

Streetscape improvements include sidewalks, walls, and landscape.



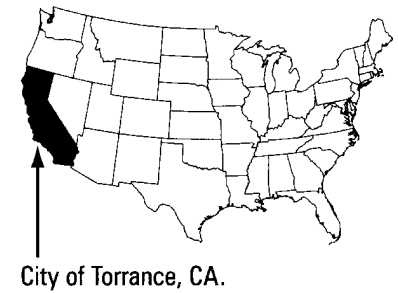
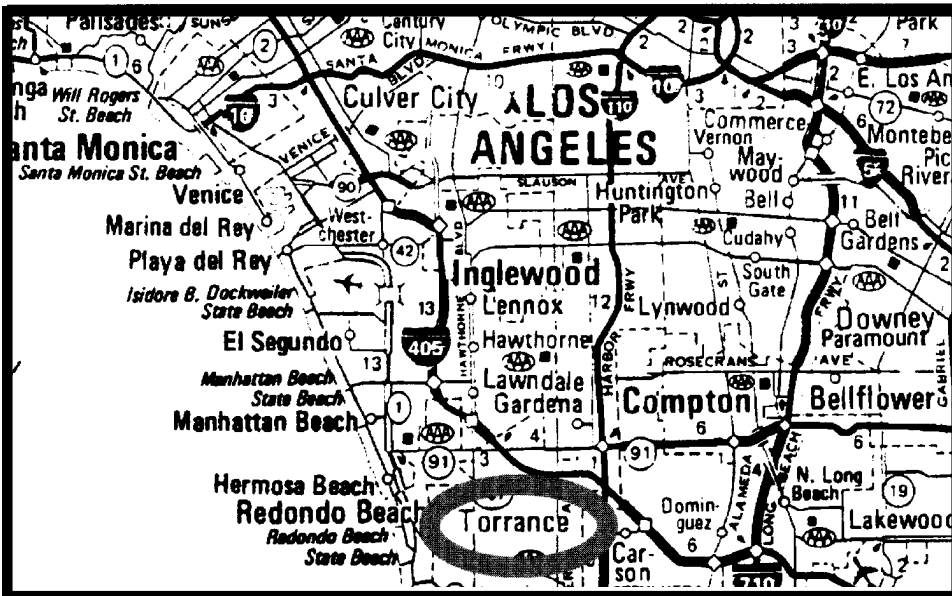
CARSON STREET RECONSTRUCTION

City of Torrance, CA

BACKGROUND/PURPOSE

Carson Street is a major east-west arterial street running through the middle of the city of Torrance. Torrance is located near Los Angeles in southern California. This reconstruction project was 1.66 km (1.03 miles) long, and its limits are Madrona Avenue to the west and Crenshaw Avenue to the east.

The street is predominately residential in character; 75 percent of the frontage is single-family homes and the remainder is multifamily garden-style apartments. Some commercial developments are located at the intersection of Carson Street and Crenshaw Avenue and in the vicinity of the Del Amo Fashion Mall, near the intersection of Carson Street and Madrona Avenue.



Location site map.

Improve Traffic Flow Along Corridor

A driving issue behind the project was to relieve congestion and increase roadway capacity to improve traffic flow to and from the expanding Del Amo Fashion Mall area, which has over 18.6 ha (2.0 million ft²) of retail commercial activity. The 1988 base-year average daily traffic (ADT) volume was 28,000, which was anticipated to increase to 31,000 by 1992. As a result of the recession experienced in the region during the late 1980's and early 1990's, the projected volume increases did not occur. The current (1995) ADT is at about the preconstruction level of 28,000 vehicles per day.

Improve Safety Conditions

High levels of traffic congestion on the original four-lane undivided cross sections and the absence of left-turn lanes were responsible for a high rate of accidents, primarily rear-end collisions. Travel speeds at about 10 mph above the posted 56.5kph (35-mph) limit and poor pavement conditions contributed to further safety concerns.

General Improvements to Street and Streetscape

Before the project, the street had no curb, gutter, or sidewalks and residential access was over dirt or gravel driveways. The street had little landscape material or aesthetic features. Utilities, such as electrical power, cable TV, and telephone, were all on overhead lines.

ENVIRONMENTAL AND DESIGN ISSUES AND CONSTRAINTS

Moving utilities underground was a major consideration of the project. The estimated cost for relocating utility lines underground, including power (Southern California Edison), cable TV (Paragon Cable Television), and telephone (Pacific Bell), was \$2.3 million, which raised the issue of funding. Another major design issue was the maintenance and improvement of existing residential driveways. Little or no driveway consolidation was desired. The presence of residential development along both sides of the roadway precluded consideration of any significant right-of-way acquisition.



Typical five-lane urban cross section.

ACTIONS TAKEN TO RESOLVE ISSUES AND CONSTRAINTS

Capacity and Safety Improvements

To improve roadway capacity and safety, a five-lane urban cross section with a two-way median left-turn lane was implemented. A seven-lane section was used at the west end of the project, where there was an existing five-lane section with curb parking. The new pavement was composed of 150 mm (6 in) of asphalt concrete pavement on top of 180 mm (7 in) of Class A base material. The preproject ADT was about 28,000 to 29,000. The proposed pavement was designed to accommodate an ADT of 30,000 with 1 to 2 percent trucks.



Plant materials and retaining wall.

General Street Improvements

Curb, gutter, and sidewalks were added along both sides of the entire project to provide improved roadway drainage and to accommodate pedestrians and bicyclists. Driveway consolidation was held to a minimum, and access was maintained by adjusting curb lines to hold a distance of 5.5 m to 6.1 m (18 ft to 20 ft) between the curb edge and garage doors.



Concrete interlocking pavers at bus stop.

Improvement to the general aesthetics of the street was a major distinguishing feature of the project. Flowering plants, shrubs, and ground cover were placed at the west end of the project on a thin median between the main street and a north side service road. Turf and eucalyptus trees were planted along the entire project in the space between the back of the curb and the new sidewalk. Concrete interlocking pavers were placed in these strips at the end-of-block locations. An underground irrigation system was installed in landscaped areas with pipes running toward adjacent properties. Landowners were asked to connect to these pipes and maintain the green spaces in front of their homes. Approximately 75 percent of the landowners complied.

Utility Undergrounding

Another major aesthetic improvement was the relocation of all the overhead power, cable TV, and telephone lines underground. The \$2.3 million price tag for this project element was paid for through the application of set-asides mandated by the State Public Utility Commission (PUC). These set-asides are collected by the public utilities in the region as part of their basic rate structure plans and made available by the PUC to such cities as Torrance for major improvement projects. Work from the edge of public right-of-way to electric meters on adjacent properties was paid for by the city of Torrance. The meter connections at individual houses were paid for by landowners at an average cost of \$150 to \$500 per unit, depending on site requirements.

Public Involvement

An extensive public involvement program was conducted throughout the entire project. Several meetings were held with both the general public and individual homeowners and businesses. Some of these meetings were held during the concept development phase of the project. The project had support from homeowners, businesses, and the city council. Almost everyone wanted the proposed improvements, but some residents were concerned with specific property issues. Such issues as accidents, congestion, noise, and traffic speed were raised by citizens early in the project. During construction, mailings and hand-delivered notices were distributed to keep the public informed of changes in traffic patterns and other milestones.

Design Exception

General urban street standards prescribed by the AASHTO Green Book and the MUTCD were used on this project. The only formal design exception associated with the project was the use of a 10.1-m-wide (33-ft) travelway for midblock U-turn movements, as opposed to the Caltrans 17.7-m (45-ft) standard.

Project Timeline

This project was conceptualized in the late 1970's. Underground Utility District #12 was established in October 1987. Utility undergrounding work was completed and overhead wires and poles were removed in January 1991. Roadway and drainage design was completed and the project was advertised for construction in March 1991. The project was awarded to Sully/Miller Construction for \$2.5 million in April 1991 and construction began in July 1991.

In order to accommodate access to the Del Amo Fashion Mall during the 1991 holiday shopping season, a temporary four-lane undivided roadway using one side of the ultimate project was constructed and opened to traffic from November 1991 through mid-January 1992. The whole project was completed and open to traffic in October 1992. The total cost of the Carson Street improvement project was \$6.2 million, including \$2.3 million for utility undergrounding and \$1.0 million for right-of-way acquisition.

LESSONS LEARNED

This was the largest single street improvement project undertaken in the city of Torrance in the last 20 years. An early and extensive public involvement program aided this project and its acceptance by the community. The program was considered very effective in minimizing public opposition and concern. Issues raised by the public, such as congestion, safety, and noise, were substantially alleviated. Noise levels have dropped since the completion of the project, which serves the pre-construction level of ADT. The drop in noise level is attributed to better pavement conditions and less traffic congestion (particularly, less starting and stopping, especially by trucks).

Following its completion, the project received an award for highway engineering design excellence from the California DOT in 1993 and was nominated for an FHWA Biennial Highway Design Excellence Award in 1994. Since the completion of the project, many landowners along the street have made significant improvements to their properties. Conditions of many of the residences along the corridor had deteriorated during the years before construction. Since the project's completion, some older homes have been demolished and replaced with newer structures. In general, the project had a very positive impact on the corridor and the community.

CARSON STREET RECONSTRUCTION AT A GLANCE

Setting:	Southern California; urban/suburban, primarily residential with some commercial areas
Length:	1.66 km (1.03 miles)
Traffic Volume:	28,000 ADT (1995 count)
Design Speed:	56 kph (35 mph)
Type of Road:	Urban major arterial; seven- or five-lane cross section with two-way median left-turn lane
Design Cost:	Some design was done in-house, but the majority was done by ASL Consulting Engineers for a total fee of \$253,000
Construction Cost:	\$6.2 million (including \$2.3 million for utility undergrounding, and \$1.0 million for right-of-way acquisition)
Key Design Features:	Use of concrete interlocking pavers, extensive plant material, and utility undergrounding in an effort to improve general aesthetics
Debts:	Incomplete participation by adjacent landowners with landscape maintenance
Similar Projects:	Lincoln Beach Parkway, Lincoln County, OR One-Way Couplet, Carbondale, IL West Broad Street, Falls Church, VA
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