



## Transportation

### Highways & Bridges

#### Client

Nevada Department of  
Transportation

#### Location

Washoe County, Nevada, USA

## I-580 Freeway Extension

### Project Highlights

- Using a Context Sensitive Solutions (CSS) public involvement process, CH2M HILL developed the design for 8.5 miles of controlled-access freeway that is aesthetically pleasing, minimizes impacts to surrounding terrain, and is supported by the community
- CH2M HILL developed a multimedia public outreach program, including photo simulations, to engage public involvement and to assist stakeholders in visualizing the alternatives
- The team provided oversight of 4.5 million cubic yards of earthwork and contour grading as well as services during construction for this \$439 million project
- Multiple CH2M HILL offices provided seamless design and construction support



### Project Description

The \$439 million I-580 Freeway Extension Project marks the final segment in Nevada Department of Transportation's (NDOT) long-range plan to construct a freeway from Carson City and the Reno-Sparks area to Panther Valley. This segment covers 8.5 miles, connecting Reno and Carson City.

NDOT has worked for decades to improve the I-580 corridor to freeway standards for its entire length in Nevada. This final segment completes I-580 through Washoe County. The existing U.S. 395 was under great strain due to increased commuter traffic and development in the south Truckee Meadows, Pleasant Valley, and north Washoe Valley areas. Some of the design challenges for this project included:

- Developing of a design that blended with the terrain, minimized impacts, and was aesthetically pleasing
- Optimizing of an alignment for the new freeway that balanced earthwork, addressed geotechnical challenges, reduced visual and noise impacts, met geometric freeway standards, and avoided significant impacts to wildlife and vegetation
- Selecting a bridge type to span Galena Creek, which would be the longest and the highest bridge in Nevada. The bridge needed to complement the freeway corridor and be visually pleasing both to the traveling public and from vantage points in Pleasant Valley and other outlying areas

Completion of the I-580 project depended on successfully addressing environmental and community concerns. Although previous segments of the freeway were constructed in stages since initial approval of the Environmental Impact Statement in 1983, public concerns regarding environmental, aesthetic, and community impacts had stalled this project. In response to this concern, CH2M HILL developed a multimedia public outreach plan, applying CSS principles.



CH2M HILL also completed the preliminary design for the new six-lane freeway. Our team evaluated roadway alignments with decision science tools to select the preferred alternative, and using photo simulation to show the public how the project would look when constructed.

### **Final Design**

CH2M HILL developed the final design of the project, which provides a safer and more efficient route to serve growing traffic needs. Maintenance and operational requirements were also incorporated into the design, addressing safety, snow removal, drainage, and incident management.

The project included the Galena Creek Bridge, a 1,720-foot, seven-span, concrete cathedral arch bridge with a 690-foot main span designed by NDOT. CH2M HILL performed an independent review of the Galena Creek Bridge design and designed eight other bridges for the project.

The selected alignment placed the roadway on sloping terrain, necessitating large cuts and fills. The total amount of earthwork and contour grading for the project was approximately 4.5 million cubic yards.

During construction, cut and fill slopes were protected with a variety of treatments to improve aesthetics and provide erosion control. These treatments included harvesting native top soil during the initial clearing and grubbing operation and placing this material over rip rap placed on the slopes. The purpose of using the native top soil was to promote re-vegetation of those slopes. The rip rap was color stained to blend with the natural topography. Other slope treatments included rock sculpting and placing rock outcroppings at highly visible locations.

More than 27,000 square yards of retaining wall were required, with mechanically stabilized earth (MSE) walls as tall as 80 feet. Wall types included MSE, cast-in-place cantilever, and tie-back walls. Two interchanges were included in the design. Fifty cross culverts with energy dissipaters were required at the base of these culverts due to the steepness of the culvert invert. Seven water quality basins and several sand-oil interceptors were incorporated to treat onsite drainage.

Upon completion, the freeway system included dynamic message signs to alert users of current driving conditions as well as anti-icing systems.

### **Services During Construction**

CH2M HILL provided traditional services during construction including review of shop drawings, submittals, and attendance at weekly construction meetings. CH2M HILL also provided public tours, management and design of a project Web site, community updates provided via e-mail and printed newsletters, and management of a Web camera that provided high-quality images of the construction site. CH2M HILL also facilitated public meetings to discuss construction progress and to provide the community with updates regarding project changes.