State Route 94 Operational Improvement Project

PROJECT DESCRIPTION

Background

State Route 94 (SR 94), a two-lane, rural highway, is the principal transportation facility that provides access from the San Diego urban area to the southeastern communities of San Diego County and to the International Port of Entry at Tecate. The highway is undivided, traversing rolling and mountainous terrain. Along the corridor are steep grades and non-standard geometric features such as curve radii, lane and shoulder widths, and stopping sight distances. The route serves a substantial amount of truck and heavy large vehicle traffic due to the Tecate Port of Entry access and the access to recreational areas to the east. In recent years, travel demands along SR 94 have grown due to growth in the corridor, surrounding land use changes, and the increase international trade and travel between the United States and Mexico.

Project Purpose and Improvements

The non-standard roadway geometrics along various segments result in lower travel speeds and substantial vehicle platoons moving at slow speeds due to the lack of adequate passing and turnout facilities along the corridor. Large vehicles and semi trucks are not able to negotiate some of the curves without crossing over the centerline stripe or driving off the edge of the pavement. In addition, there is a lack of passing opportunities behind slow moving vehicles.

The purpose of this project is to maintain or improve current and future traffic operations in the SR 94 rural corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year 2030. The goals of this project are to:

- Improve highway operations while maintaining current capacity.
- Reduce delays and improved travel time.
- Increase sight distances.
- Improve maneuverability and room for vehicles to avoid roadway hazards (e.g. falling rocks and other debris).
- Enable legal length vehicles to stay within traffic lanes (e.g. allowing for Surface Transportation Advisory Act [STAA] design trucks to use SR 94 without having to cross the roadway centerline or use both lanes when traveling through curved sections).

Project Improvements

Traffic operations and travel speeds vary along the SR 94 project corridor. In most areas, traffic operations are adequate with appropriate travel speeds and a low accident history. On the other hand, there are areas within the project corridor suffering from poor traffic operations and reduced travel speeds. These areas are potentially hazardous due to the existing highway geometrics and terrain. While this project would improve overall operations and travel speeds along the corridor, it will focus on improving the critical areas where travel conditions are restricted.

Five different types of improvements are considered in this project. The improvements are realignment of deficient curves, installing passing lanes, widening of the traveled way and installing standard 8-foot shoulders, and adding/improving turn pockets. Within the project area, deficient curves are identified as STAA-deficient curves (referred to as STAA curves), where trucks have offtracking and/or passing problems, and non-standard curves for a design speed of 40 mph (under 550 ft in radius). Within the project limits, twenty-eight curves were identified as STAA curves, while eighteen curves were identified as non-standard. Passing lanes were determined to be feasible at five locations, and four locations were identified for widening. A recommendation regarding the feasibility of improving existing turn pockets and/or adding new pockets will be performed at a later stage.

The proposed improvements were developed in accordance with the Purpose and Need Statement for the project, the Caltrans accident report (aka TASAS Report), the recommendations from Caltrans maintenance department, and the assessment of operational benefits (Traffic Operations Report). These improvements include:

- Truck Curves: Truck curve corrections are consistent with the project's Need and Purpose Statement which includes truck offtracking and inability to negotiate certain curves or safely pass one another as a high priority issue that this project is to address. The Caltrans accident report and maintenance recommendations were used to set the priority among the twenty-eight truck deficient curves within the project limits.
- Passing Lanes: Passing lanes will improve operations by reducing the travel time throughout the corridor and the "percent-time-spent-following". The "percent-time-spent-following" represents the average travel time (in percentage of the total travel time) that a vehicle must travel in a platoon following a slower-moving vehicle due to lack of passing opportunities. Percent-time-spent-following has a great effect on the freedom to maneuver, driver comfort, convenience, and frustration.
- Non-Standard Curves: Non-standard curve corrections will improve traffic operations but it will not substantially improve travel speed, percent-time-spent-following, or public safety, as much as the STAA curve corrections and passing lanes.
- Lane Widening: Under this type of improvement, the traveled way will be widened to twelve feet with standard eight-foot shoulders. This type of improvement is expected to increase the driving speed and reduce the percent-time-spent-following, which will improve the operations in general along the corridor.
- Turn Pockets: Turn pockets will be improved (or added) at intersections with relatively high concentrations of left-turning traffic (pending further traffic analysis). Turn pockets have a considerable effect in reducing percent time-spent-following and preventing vehicle platooning.

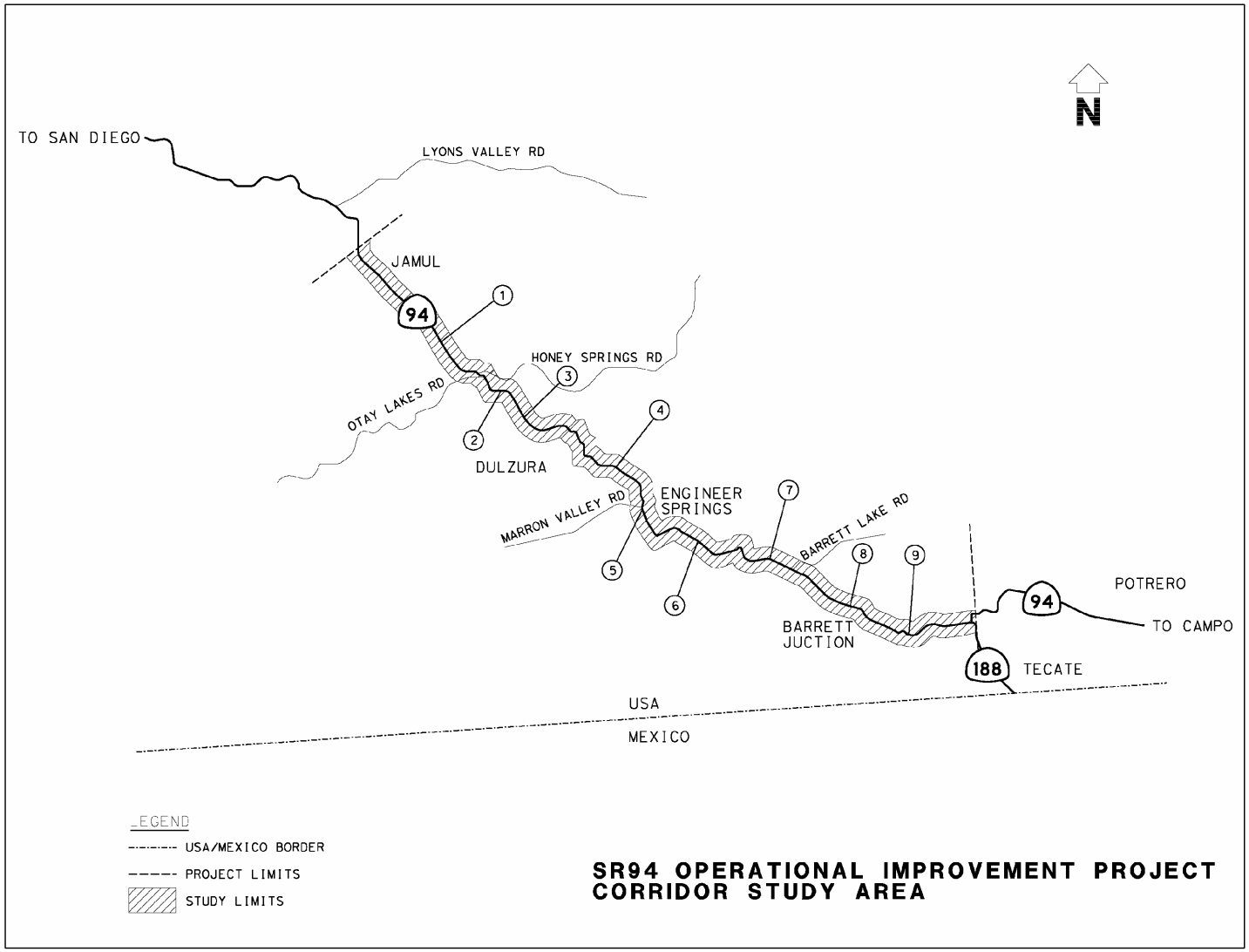
Improvements within the project limits were developed for nine locations as shown on Figure 1. Table 1 lists the operational improvement locations including starting and ending post miles, related traffic issues, and proposed improvements. Improved or new turn pockets will added at intersections with relatively high concentrations of left-turning traffic (pending further traffic analysis) where needed at each of the nine locations.

Table 1
Operational Improvement Locations

Location	Post Miles (Start-End)	Location issue	Proposed Improvements
1	20.7 to 24.2	Steep grades and limited passing opportunities	• New eastbound and westbound passing lanes. • Pavement widening at selected locations.
2	24.2 to 26.4	Short passing lane	• Extend existing eastbound passing lane and add new westbound passing lane. • Pavement widening at selected locations.
3	25.5 to 26.9	Steep grades and restricted curves	• Realignment of truck-deficient and non-standard curves.
4	26.9 to 29.2	restricted curves, restricted roadway width, and limited right-of-way	• Realignment of truck-deficient curves • Widening of lanes to 15 feet and installing 8-foot shoulders.
5	29.2 to 30.6	Non-standard curves and restricted roadway widths	• New westbound passing lane. • Realignment of non-standard curves. • Pavement widening at selected locations.
6	30.6 to 32.4	Tight curves	• Realign of non-standard curves. • Pavement widening at selected locations.
7	32.4 to 34.4	tight curves and steep grades	• New eastbound and westbound passing lanes. • Realign non-standard curves. • Widen lanes to 15 feet and add 8-foot shoulders.
8	34.4 to 37.0	Steep grades	• New eastbound and westbound passing lanes. • Realign non-standard curves.
9	37.0 to 38.2	restricted curves and limited roadway width	• Realignment of truck-deficient curves. • Widen lanes to 15 feet and add 8-foot shoulders. • Pavement widening at selected locations.

Figure 1 illustrates the overall SR 94 project corridor and approximate location of the nine improvement locations (represented by circles and numbers).

FIGURE 1


N
TO SAN DIEGO
LYONS VALLEY RD
JAMUL
94
1
HONEY SPRINGS RD
3
OTAY LAKES RD
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DULZURA
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MARRON VALLEY RD
ENGINEER SPRINGS
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7
BARRETT LAKE RD
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9
BARRETT JUCTION
94
POTRERO
TO CAMPO
188
TECATE
USA
MEXICO
LEGEND
USA/MEXICO BORDER
PROJECT LIMITS
STUDY LIMITS
SR94 OPERATIONAL IMPROVEMENT PROJECT
CORRIDOR STUDY AREA