Traffic Operations

This section provides information on segmentation, traffic volumes, level of service, concept level of service, and current and future facility and segment concepts for SR 273.

1. Segmentation

For the purpose of operational analysis, SR 273 was broken into 12 segments. Some of the factors considered in indentifying segments for analysis were: the number of lanes, changes in lane and/or shoulder width, change in grade, change in speed, separation of lanes as in the couplet area, etc. **Table 4.1** contains the 12 segments for SR 273.

Table 4.1
SR 273 Segments

Segment Number	Segment Limits	Begin Post Mile	End Post Mile
1	Jct. I-5 to Factory Outlets Drive	3.81	4.30
2	Factory Outlets Drive to South Street	4.30	5.21
3	South Street to Ox Yoke Road	5.21	6.90
4	Ox Yoke Road to Canyon Road	6.90	11.10
5	Canyon Road to South Bonnyview	11.10	12.68
6	South Bonnyview to Breslauer Way	12.68	14.18
7	Breslauer Way to Buenaventura Blvd	14.18	14.47
8	Buenaventura Blvd to Cypress Avenue	14.47	15.92
9A	Cypress Avenue to Market/Eureka	15.92	16.83
9B	Market/Eureka to Cypress Avenue	15.92	16.83
10	Eureka Way to Benton Drive	16.83	17.81
11	Benton Drive to Lake Blvd	17.81	18.62
12	Lake Blvd to Jct. I-5	18.62	20.03

2. Traffic Volumes

The majority of the traffic on SR 273 is locally generated; therefore, traffic volumes remain fairly constant throughout the year. The existing and forecast Average Daily Traffic (ADT) volumes for the route are shown in **Table 4.2**. The information in this table was created using existing published traffic volumes and the Shasta County Travel Demand Model (November 2011 version).

Existing traffic volumes on SR 273 range from around 9,500 vehicles per day at the northern and southern limits of the route, to as high as 25,000 in the City of Redding. Future traffic volumes are forecast to range from 10,700 vehicles per day at the southern end of the route to as high as 29,000 in the City of Redding. Truck volumes on the route range from approximately 250 to 1,100 trucks per day.

Table 4.2
Average Daily Traffic and Level of Service Summary for SR 273

Segment No.	Segment Description	Begin Post Mile	End Post Mile	2010		2030	
				ADT	LOS	ADT	LOS
1	Jct. I-5 to Factory Outlets Drive	3.81	4.30	9,800	A	10,700	A
2	Factory Outlets Drive to South Street	4.30	5.21	13,500	A	15,600	A
3	South Street to Ox Yoke Road	5.21	6.90	12,400	A	14,500	A
4	Ox Yoke Road to Canyon Road	6.90	11.10	14,000	A	18,200	A
5	Canyon Road to South Bonnyview	11.10	12.68	23,000	C	26,800	E
6	South Bonnyview to Breslauer Way	12.68	14.18	18,100	B	21,400	C
7	Breslauer Way to Buenaventura Blvd	14.18	14.47	21,500	C	25,400	D
8	Buenaventura Blvd to Cypress Avenue	14.47	15.92	18,400	C	20,800	D
9A	Redding Couplet (NB) Cypress Avenue to Market/Eureka	15.92	16.83	12,500	C	15,700	E
9B	Redding Couplet (SB) Market/Eureka to Cypress Avenue	15.92	16.83	9,500	A	12,100	C
10	Eureka Way to Benton Drive	16.83	17.81	21,400	C	25,300	D
11	Benton Drive to Lake Blvd	17.81	18.62	25,000	C	29,000	D
12	Lake Blvd to Jct. I-5	18.62	20.03	9,400	A	13,200	A

Segment 9 is broken into 9A and 9B to represent the split of SR 273 into the couplet as it passes through the City of Redding.
ADT = Average Daily Traffic; LOS = Level of Service

3. Level of Service (LOS)

Level of Service (LOS) is a qualitative measure describing operational conditions within a stream of traffic. The six different Levels of Service are designated from "A" to "F" with LOS "A" representing the best operating conditions and LOS "F" the worst. For example, an LOS between "A" and "C" is generally not considered congested; however, at LOS "D" traffic starts to feel congested, and traffic with an LOS of "E" and "F" is definitely congested.

To determine the LOS for SR 273, a lookup table was created based on the Highway Capacity Manual. This table was created using highway capacity methodology and is consistent with lookup tables used by local agencies. SR 273 is divided up into 12 separate segments with each segment receiving its own LOS. Adjustment factors were applied to the Average Daily Traffic (ADT) volumes based on "friction factors" experienced in each particular segment. **Table 4.2** provides estimates of LOS for 2010 and 2030. See **Appendix G** for a more in-depth description of how LOS was determined.

4. Concept LOS

Concept LOS is used to describe the target operational condition for a facility during the twenty-year planning horizon of the Transportation Concept Report. Planning studies for projects to improve highway capacity/operation should begin at the time when a highway segment is projected to exceed the concept LOS.

The Concept LOS for SR 273 is D

Caltrans District 2 typically strives to maintain an LOS concept on its rural highways at the C/D threshold. However, on SR 273 the District has set the concept LOS at LOS D. The reasons for this are as follows:

- SR 273 serves as an urban arterial (it is not an interregional route)
- I-5 is designated as high-speed south/north interregional route for long distance travel
- SR 273 heavily constrained:
    - Railroad proximity (primarily east side of route)
    - ACID Canal – proximity at multiple locations
    - Right of Way – property acquisition would be required to add lanes and much of the adjoining land is developed
    - Proximity of frontage roads
    - Environmental considerations
    - Structures – some would require full replacement in order to expand
    - Utilities – poles, large underground gas lines
    - Drainage

5. Current and Future Facility and Segment Concepts

In its most basic form, a "facility concept" is used to describe the number of through travel lanes on a highway. To assist Caltrans and other agencies in current and future planning activities for SR 273, the term is used in three specific ways in this report:

Facility Concept –
The intended number of through travel lanes and degree of access control for the entire route. Specific segments may differ based on location-specific factors.

Existing Segment Concept –
This term is applied to specific segments of a facility and describes the existing number of through travel lanes and any special features that may currently exist in the segment (such as auxiliary travel lanes, carpool lanes, access control, etc.).

20-Year Segment Concept –
This term is applied to specific segments of a facility and describes the number of though travel lanes and any special features that may be needed twenty years in the future in order to maintain the Concept LOS in the segment.

The Facility Concept for SR 273 is a four-lane conventional highway and will remain so. Those portions of the route where access control has been previously acquired will be maintained with access control.

SR 273 Facility Concept –

Four-lane Conventional Highway*

*Maintain areas of existing access control

Table 4.3 provides the **Existing Segment Concept** and **20-Year Segment Concept** for each of the twelve segments of SR 273. The concepts for each segment were identified based on review of past studies, input received from partner agencies and the public, and the analysis contained in this report.

Past Studies –
Previous studies regarding SR 273 (listed below) did not propose any expansion of the route due to lack of need and/or the presence of significant constraints. The 1984 Route Concept Report even suggested that if additional capacity was needed in the SR 273 corridor in the future, it be provided by expansion of the frontage road system.

- Route Concept Report for SR 273 (Caltrans, 1984)
- Route Corridor Study for SR 273 (Shasta County Regional Transportation Planning Agency, 1988)
- Downtown Redding Specific Plan (City of Redding, 2001)
- Traffic Circulation Study for Downtown Mall Improvements (Omni-Means, 2003)

Table 4.3
SR 273 Segment Concepts

Segment No.	Post Mile Limits	Segment Description	Existing Segment Concept	20-Year Segment Concept
1	3.81 – 4.30	Jct. I-5 to Factory Outlets Drive	4C with Access Control	4C with Access Control
2	4.30 – 5.21	Factory Outlets Drive to South Street	4C	4C
3	5.21 – 6.90	South Street to Ox Yoke Road	4C	4C
4	6.90 – 11.10	Ox Yoke Road to Canyon Road	4C	4C
5	11.10 – 12.68	Canyon Road to South Bonnyview	4C	4C with Auxiliary Lanes
6	12.68 – 14.18	South Bonnyview to Breslauer Way	4C	4C
7	14.18 – 14.47	Breslauer Way to Buenaventura Blvd	4C	4C
8	14.47 – 15.92	Buenaventura Blvd to Cypress Ave	4C	4C
9A	15.92 – 16.83	Cypress Avenue to Market/Eureka (Couplet NB)	S3 (3 Lanes Northbound)	S3 (3 Lanes Northbound)
9B	15.92 – 16.83	Market/Eureka to Cypress Avenue (Couplet SB)	S3 (3 Lanes Southbound)	S3 (3 Lanes Southbound)
10	16.83 – 17.81	Eureka Way to Benton Drive	4C	4C
11	17.81 – 18.62	Benton Drive to Lake Blvd	4C	4C
12	18.62 – 20.03	Lake Blvd to Jct. I-5	4C with Access Control	4C with Access Control

4C = Four-Lane Conventional Highway

Partner Agency and Public Input Received –
During the kickoff for the SR 273 TCR, staff at the City of Redding inquired as to the possibility of reducing the number of lanes through the couplet from three to two in each direction. Space made available by the reduction in vehicle lanes might then be used for streetscape improvements, additional parking and other modes of travel. Two reports prepared for the City of Redding provide information relevant to this issue. First, the "Summary Report to the City Council from the Downtown Parking Committee" (January 2007) found that additional parking was not currently needed in the downtown area and any need for additional parking in the future could be met with a combination of on- and off-street parking. Second, a Pedestrian Safety Assessment conducted by UC Berkeley (April 2010) suggested *considering* a reduction from three to two lanes in each direction in the couplet area. The study was conceptual in nature and noted that more detailed studies would be needed before making any decisions. It also suggested a comprehensive pedestrian plan be developed for the City of Redding before any changes are implemented.

Public comments received during preparation of the TCR generally supported maintaining the existing number of lanes on SR 273. Several comments actually suggested expanding SR 273 to six lanes south of the current six lane couplet section. A number of comments emphasized the need to consider bicycle and pedestrian activity in the downtown area.

In addition to the above, it should be noted that the Shasta Regional Transportation Agency has identified I-5 as the priority for expansion to six lanes to accommodate north-south travel in the region. This makes it likely that the majority of regional funding committed to highway expansion for the foreseeable future will go to I-5.

Current Analysis –
As shown in **Table 4.2**, the existing number of through travel lanes in all but two segments of SR 273 (Segments 5 and 9A) will provide for acceptable operations (meet the Concept LOS of D) through 2030. For those segments that meet the Concept LOS, no change has been made in **Table 4.3** between the Existing Segment Concept and the 20-Year Segment Concept. For the two segments of SR 273 forecast to operate below the Concept LOS of D at 2030, one segment concept has been modified in the future (Segment 5) while the other has not. The rationale for this decision is explained in the next section – Route Management and Development.

An analysis was also performed on the request to consider reducing the number of lanes through the downtown couplet (Segments 9A and 9B) from three to two. The evaluation showed that LOS would decline by one or possibly two levels at 2030 as a result of the reduction in the number of travel lanes. For the Northbound direction of travel (Segment 9A), any reduction in the number of lanes will therefore not be feasible since the Concept LOS of D will be exceeded (fall to E) by 2030 even with the three existing travel lanes. In the Southbound direction of travel (Segment 9B), however, it may be possible to maintain LOS at D at 2030 with only two lanes. The City of Redding may wish to conduct a more detailed evaluation of Segment 9B to determine what specific modifications might be feasible.