The build alternatives could affect utilities, including domestic water service, wastewater collection and treatment, natural gas service, electric service, and telephone and television utilities.

Construction of the HOV lanes south of the Cabrillo Boulevard interchange would be accomplished without affecting the railroad right-of-way, other than temporary construction easements. Alternatives 1, 2 and 3 would each require a temporary construction easement to replace the Arroyo Parida Bridge (at Arroyo Paredon Creek). However, the proposed work to rebuild the Cabrillo Boulevard interchange would have varying railroad construction impacts that depend on which design configuration is selected. Three of the five Cabrillo Boulevard interchange configurations (J, M and M Modified) propose a full reconstruction and the need for raising the rail line profile (about 4 feet) for half a mile. They would also replace existing structures to provide hook ramps under the tracks with standard vertical clearances. Approvals and easements required from the railroad would require an additional 12 months of lead time for interchange configuration J, M or M Modified. Costs associated with railroad improvements have been estimated at approximately $50 million for interchange concepts J, M and M Modified.

Avoidance, Minimization, and/or Mitigation Measures

As indicated in Section 2.4, coordination between Caltrans and service providers would strive to ensure that utility and services are not disrupted. Pre-construction utility location would be required in conjunction with service providers to avoid disruption of any utility service. Before and during construction, all utilities in conflict with the proposed project would be relocated, avoided, or protected in place.

With the F Modified configuration for the Cabrillo Boulevard/Hot Springs Road interchange, only temporary and minor permanent easements are needed from Union Pacific Railroad.

2.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Regulatory Setting

Caltrans, as assigned by the Federal Highway Administration, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When

current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

Caltrans is committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

Affected Environment

U.S. 101 is the most heavily traveled facility in the county and serves as a vital north-south connection between Northern California and Southern California. The highway also plays a vital role in enabling motorists to access local communities (Ventura, Carpinteria, Summerland, Montecito, Santa Barbara, and Goleta) and coastal areas near the project area. Recognition of this corridor's important role was the basis for preparing a comprehensive set of traffic studies for the proposed South Coast 101 HOV Lanes project.

Traffic data collected in April 2008 along a 27.5-mile section of U.S. 101 were used as a baseline for the following reports: Existing Conditions Operational Analysis (December 15, 2008, Amended December 9, 2011); Travel Forecast Report (February 9, 2009); Forecast Operations Report (October 19, 2009, amended December 9, 2011); and Cabrillo-Hot Springs Interchange Configuration Analysis Technical Memoranda (March 21, 2011 and July 19, 2011).

The traffic studies analyzed 27.5 miles of U.S. 101 from south of Rincon Point/Bates Road interchange to north of the Hollister interchange in Goleta. The extended study limits were necessary to gain a better understanding of how the proposed project would affect the entire South County section of U.S. 101. Within the traffic study area, U.S. 101 varies between four and six lanes wide, with auxiliary lanes in some segments. With the completion of the Ventura/Santa Barbara HOV project in 2015, three lanes in each direction will exist to the south of the project on U.S. 101 from the City of Ventura in Ventura County to the Carpinteria Creek Bridge (post mile 2.0). North of the project limits U.S. 101 has three lanes in each direction from Cabrillo Boulevard (post mile 11.5) to Fairview Avenue (post mile 22.5). The traffic analysis studied the existing operating characteristics of U.S. 101 as well as the interchanges on U.S. 101 that provide access to and from the local street network.

In this corridor, travel patterns show that most commuters travel from the cities of Ventura and Carpinteria into Santa Barbara in the morning and then travel the reverse commute in the evening. The morning peak commute period is generally 7:00 a.m. to 9:00 a.m., and the afternoon peak commute period is 3:30 p.m. to 6:30 p.m. This commuter trend is expected to continue based on existing and predicted housing and job patterns. In addition to daily commuter travel, the afternoon travel period tends to have a greater diversity in trip types, which is reflected by the higher numbers seen during the northbound afternoon peak hours of delay (see Table 2.15). Other trip types in this corridor include interregional travel, goods movement, tourist travel as well as more localized travel for activities such as shopping, recreation, and coastal access.

According to the *Multimodal Corridor System Management – Incorporating Analysis of Transit, Demand Management Programs and Operational Strategies* report, prepared in 2010 for Santa Barbara County Association of Governments, in addition to its regional value, the U.S. 101 serves an even larger role.

U.S. 101 is on the Interregional Road System and the National Truck network. It is designated as a High Emphasis Route and Focus Route in the 2013 Caltrans Interregional Transportation Strategic Plan. U.S. 101 is a Strategic Highway Corridor Network (STRAHNET) route, meaning it is part of a network of linked highways essential to national defense (facilitates the movement of troops and equipment to airports, ports, rail lines, and military bases). This makes this route a high priority for programming to address increased interregional travel demand with an emphasis towards goods movement, recreational, and lifeline needs. Although U.S. 101 is important for interregional traffic, it also serves commute traffic within and from outside of Santa Barbara County and can be used as an evacuation route. It is designated for use by rural areas to growing urban centers and is critical for moving people, goods, services, and technology. U.S. 101 also plays a larger role in the state economy by serving as a secondary route to Interstate 5, by connecting the Los Angeles Basin to Northern California. About 6.7 percent of the traffic along this corridor is attributed to trucks.

In terms of goods movement, there is a great deal of activity along the South Coast and between the cities of Los Angeles and San Francisco. The fresh-packed produce grown in the area, including products related to the wine industry in Santa Barbara and San Luis Obispo counties, is moved by truck or train to the two cities before being shipped out of the region. Interregional travel is also common between Los Angeles and San Francisco and points between.

Collision Rates

Collision rates were evaluated for the three-year period from October 1, 2006 through September 30, 2009 within the project limits for U.S. 101. (Three years of accident data are not yet available following completion of the Milpas Street to Hot Springs Road Operational Improvement project.) During this reporting period, there were 539 total collisions northbound and 361 collisions southbound for a total of 900 accidents on U.S. 101 within the project limits. There was one fatality and 283 accidents involving injuries for both southbound and northbound traffic. The total collision rate for the three-year period is higher than the statewide average for similar facilities (1.02 vs. 0.83). The higher total collision rate can be attributed to unstable traffic flow caused by congestion. The northbound accident rate within the project limits was 1.22 accidents per million vehicle miles. This is 47 percent higher than the statewide average of 0.83 accidents per million vehicle miles for similar four-lane urban freeways. On southbound U.S. 101, the data indicate that the total actual collision rate per million vehicle miles was less than the average rate for similar highway segments.

Of the 900-accident total, 594 collisions (66 percent) were rear-end collisions; 77 accidents (9 percent) were sideswipe collisions; and 192 accidents (21 percent) were hit-object collisions. Most of the accidents (96 percent), therefore, were congestion-related collisions. Because the purpose of the project is to reduce congestion, these accident rates on the freeway mainline are expected to drop.

Collision rates for the northbound Hermosillo Road off-ramp, northbound Cabrillo Boulevard left off-ramp, southbound Cabrillo Boulevard left off-ramp, and the southbound Los Patos Way off-ramp are all above the statewide averages for each ramp (see Table 2.13). The Hermosillo off-ramp averages one non-injury collision per year, which is too small a sample to determine if the collision rate is significant. Analysis of the collisions for the other Cabrillo Boulevard ramps noted above indicate excessive speed to be the common factor. The project proposes to close some ramps, relocate ramps with standard geometry, or improve the geometry of existing ramps. Based on these improvements, the collision rates are expected to drop for the interchange ramps.

Table 2.13 U.S. 101 and Ramp Collision Data from October 1, 2006 to September 30, 2009

Location Limits (post miles 1.4 to 12.3)	Number of Collisions			Actual Rates (*accidents per million vehicle miles traveled*)			Average Rates (*accidents per million vehicle miles traveled*)		
	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
Northbound U.S. 101	1	162	539	0.002	0.37	1.22	0.010	0.27	0.83
Southbound U.S. 101	0	122	361	0.000	0.28	0.82	0.010	0.27	0.83
Ramps within the Project Limits									
Southbound Sheffield left on-ramp	0	0	0	0.000	0.00	0.00	0.002	0.26	0.75
Southbound Sheffield left off-ramp	0	1	2	0.000	0.45	0.91	0.004	0.42	1.20
Northbound Hermosillo off-ramp	0	0	3	0.000	0.00	2.70	0.004	0.28	0.95
Northbound Cabrillo left off-ramp	0	1	4	0.000	0.34	1.35	0.002	0.31	1.00
Northbound Cabrillo on-ramp	0	0	2	0.000	0.00	0.22	0.002	0.26	0.75
Southbound Cabrillo left off-ramp	0	4	8	0.000	0.75	1.50	0.002	0.31	1.00
Southbound Los Patos off-ramp	0	1	3	0.000	1.75	5.25	0.005	0.15	0.45

Source: Caltrans Traffic Accident Surveillance and Analysis System - represents 3 years of continuous data that were not affected by periods of highway construction on the Milpas to Hot Springs Improvement Project, which would have skewed the results.

Transit

According to the Transit Needs Assessment prepared for Santa Barbara County Association of Governments in 2013, the transit providers and systems that transport commuters from outlying cities into Santa Barbara include: Santa Barbara Metropolitan Transit District (SBMTD), Ventura County Transportation Commission (VISTA), Coastal Express Limited, Clean Air Express, and City of Lompoc Transit (COLT).

SBMTD is the largest transit service provider in Santa Barbara County with a total annual ridership over 7 million (7,948,409 in fiscal year 2011/2012). This service includes bus routes throughout the area and shuttle operations serving downtown, the

waterfront, commuter lots, and the zoo. It serves Carpinteria, Summerland, Santa Barbara, and Goleta. SBMTD also operates commuter express bus service between Solvang and Buellton and the Hollister corridor in Goleta and downtown Santa Barbara. SBMTD operates 51 transit routes on the South Coast that include 28 regular routes and 23 school booster routes.

VISTA provides intercommunity bus service that operates between Ventura County and Santa Barbara, including service to University of California Santa Barbara, the Hollister corridor in Goleta, downtown Santa Barbara, and downtown Carpinteria. VISTA operates 53 weekday drips and 20 daily weekend trips between Ventura and the South Coast. VISTA, which is a joint program administered between SBCAG and the Ventura County Transportation Commission (VCTC), had a ridership of 311,827 in fiscal year 2011/2012.

The Coastal Express Limited is a pilot commuter bus service for the U.S. 101 Mussel Shoals\Carpinteria HOV Widening project and began operations in August 2011. This weekday-only commuter bus service provides two round-trips to Goleta and two to Santa Barbara from Ventura County. The Clean Air Express is a commuter bus program that currently provides service to residents of northern Santa Barbara County who commute to jobs in Santa Barbara and Goleta, with 13 round-trips each weekday from North Santa Barbara County to the South Coast. In fiscal year 2011/2012, the Clean Air Express had 222,432 boardings. On Tuesdays and Thursdays, the City of Lompoc Transit (COLT) also provides one round-trip shuttle service to Santa Barbara from Lompoc.

Bicycle and Pedestrian Routes

About 299.7 miles of bikeways run through Santa Barbara County, and about 163.1 miles of bikeways are in the South Coast region. Most of the designated bikeways in the county are Class II and Class III. One recently constructed section of Class I bikeway is adjacent to U.S. 101 along Ortega Hill between Summerland and Sheffield Drive. When bicycles share a local road with vehicles and there is no bikeway designation, it is simply known as a local road. Bikeway classifications are defined in Table 2.14.

Table 2.14 Bikeway Classifications

Bikeway Class	Definition
Class I Bikeway (Bike Path)	Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross-flow by motorists minimized.
Class II Bikeway (Bike Lane)	Provides a striped lane for one-way bike travel on a street or highway.
Class III Bikeway (Bike Route)	Provides for shared use with pedestrian or motor vehicle traffic.
Source: Caltrans Highway Design Manual, September 2006.	

The county also contains multipurpose recreational trails used by bicyclists, hikers, joggers, in-line skaters, skateboarders, and equestrians. A portion of the Pacific Coast Bike Route is located in the project area. The Pacific Coast Bike Route provides a north-south connection between Vancouver, British Columbia, Canada, and Imperial Beach in San Diego, California. Cyclists use the existing route mainly for recreation and local commuting. The Pacific Coast Bike Route through the project limits is a combination of Class I, II, and III bikeways and local roads. Due to safety reasons, bicyclists are not allowed on this stretch of U.S. 101 with the exception of the Class I bike path that parallels the highway on Caltrans right-of-way over Ortega Hill.

Several Class II bikeways are in the project area, including those on Carpinteria Avenue, Via Real, Jameson Road, San Ysidro Road, Olive Mill Road, Coast Village Road, Hot Springs Road, and Olive Mill Road. The project area also contains a few shorter segments of Class I and Class III bikeways, including the previously mentioned Class I path over Ortega Hill built in 2006 as part of the auxiliary lane project that connected the Evans Avenue on-ramp to the northbound Sheffield Drive off-ramp.

According to the Santa Barbara County Association of Governments' Regional Bicycle Plan, on a countywide basis, bicycle use for commuting purposes ranges from 2 to 4 percent of total commute trips. Similarly, according to the Santa Barbara County Association of Governments' *2007 Commute Profile for Santa Barbara, San Luis Obispo and Ventura Counties*, the percentage of Santa Barbara County commuters who bike to work is 2.8 percent, and the percentage of commuters who walk or jog to work is 2.7 percent. Between 2000 and 2011, bicycle commuting grew 47 percent nationwide, with most of the growth occurring in the larger cities: Portland, San Francisco, Seattle,

Boston, New York City and Washington D.C. Santa Barbara County ranks high for the number of bicycle commuters.

Pedestrian facilities near the project area consist of sidewalks and pedestrian trails. Main sidewalks near the project area include those along Carpinteria Avenue and Via Real in Carpinteria; Lillie Avenue in Summerland; and those along Calle Real and Coast Village Road in Santa Barbara. Sidewalks and cross-paths are provided on many streets near the interchanges, but those facilities are not continuous on all streets.

Environmental Consequences

U.S. 101 Mainline Analysis

The three build alternatives would have similar effects on U.S. 101 traffic flow because their differences are strictly focused on whether the widening is proposed to the inside median or outside shoulder. The project's performance measures associated with U.S. 101 mainline patterns were analyzed based on the following three measures of effectiveness:

- Peak period delay (vehicle hours and person hours)

  Vehicle delay is calculated based on the length of time it takes for a vehicle to complete a travel trip. Person hours are based on average vehicle occupancy multiplied by peak period vehicle hours of delay. Delay occurs on U.S. 101 when vehicles travel at speeds below 55 miles per hour. Peak period delay is the sum of all vehicle delay that occurs within a given peak period, or on a typical day, within the designated traffic study area.

- Peak hour trip time

  The length of time it takes to travel during the peak periods (morning and afternoon) between the Ventura County line and North Goleta.

- Peak hour average speed

  The average speed that occurs during a specific hour of highest travel demand (one hour in the morning and one hour in the evening).

Because of the heavily congested conditions already occurring several hours each day, the identified measures of effectiveness were selected instead of the level of service measurement typically used for Caltrans projects. Peak commute periods currently occur from about 7:00 a.m. to 9:00 a.m. and 3:30 p.m. to 6:00 p.m. The peak analysis period is from 6:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m. The measures were

quantified using FREQ macro-simulation software that was developed by the Institute for Transportation Studies at the University of California at Berkeley.[8]

Peak hour intersection analysis was also conducted at U.S. 101 interchange locations within the traffic study limits. Intersection Level of Service, delay, and 95th Percentile Queue were used as the main measures of effectiveness for the intersection analysis.

Table 2.15 provides data for existing (2008) mainline operating conditions and anticipated mainline operating conditions in the design year (2040) based on the three measures of effectiveness noted above.

[8] The FREQ modeling software, developed by the Institute for Transportation Studies at the University of California at Berkeley, was used to simulate peak period freeway operations on U.S. 101 within the study area. The software was selected because it can quickly produce traffic operations results using planning model inputs.

Table 2.15 U.S. 101 Peak Direction Measure of Effectiveness Summary**

Measures of Effectiveness	Existing 2008	No-Build 2040	Build 2040
Northbound morning peak hour average speed (mph) ~^	44.9	26.2	40.5
Southbound afternoon peak hour average speed (mph) ~^	49.3	39.8	52.2
Northbound morning peak hour travel time (minutes) ~*	22.3	48.5	29.3
Southbound Afternoon peak hour travel time (minutes) ~*	23.0	34.7	24.5
Northbound morning peak period hours of delay (vehicle hours) ^	937	9,258	1,492
Southbound morning peak period hours of delay (vehicle hours)	154	1,507	786
Southbound afternoon peak period hours of delay (vehicle hours) ^	871	3,383	1,122
Northbound afternoon peak period hours of delay (vehicle hours)	324	4,261	3,574
Vehicle Occupancy AM	1.27	1.38	1.65
Vehicle Occupancy PM	1.40	1.42	1.70
Northbound morning peak period hours of delay (person hours) ^	1,190	12,776	2,462
Southbound morning peak period hours of delay (person hours) ^	196	2,080	1,297
Southbound afternoon peak period hours of delay (person hours) ^	1,219	4,804	1,907
Northbound afternoon peak period hours of delay (person hours) ^	454	6,051	6,076

Data from "SC 101 HOV Traffic Study forecast Operations Report" dated October 19, 2009 and errata sheet dated March 16, 2011

~ = Peak hour refers to the "worst hour" in a given peak period when travel through the corridor takes the longest

**= for a trip traveling on U.S. 101 between Linden Avenue and Los Carneros (about 20 miles)*

^ = for trips traveling within the traffic study limits (post miles 0.0/27.5)

***Using FREQ Modeling Software*

Peak Hour Speed

Within the traffic study area (U.S. 101 mainline between the Ventura and Santa Barbara county line and North Goleta), the current average speed northbound during the morning peak hour is 44.9 miles per hour. Without the project in 2040, the average speed for the same time and direction of travel would decrease to 26.2 miles per hour. Similarly, the southbound afternoon peak hour average speed is currently 49.3 miles per hour; without the project in 2040, average speeds would decrease to 39.8 miles per hour. With the project in 2040, the average speed would increase to 40.5 miles per hour northbound during the morning peak hour while the average speed would increase to 52.2 miles per hour southbound during the afternoon peak hour (see Table 2.16).

Table 2.16 Peak Hour Travel Speed (2040)

	Northbound Morning	Southbound Afternoon
Travel Speed without Project	26.2 mph	39.8 mph
Travel Speed with Project	40.5 mph	52.2 mph
Travel Speed Improvements with Project	14.3 mph	12.4 mph
Percent Improvement	54.6%	31.1%

Data from "SC 101 HOV Traffic Study forecast Operations Report" dated October 19, 2009 and errata sheet dated March 16, 2011
**Average travel speed shown for a vehicle traveling within the traffic study limits, between the Ventura County line and Winchester Canyon (approximately 27.5 miles).*

Peak Hour Travel Time

Currently, it takes about 22.3 minutes to reach Los Carneros (Goleta) from Linden Avenue (Carpinteria) during the morning peak hour traffic. Without the project in 2040, it is projected to take 48.5 minutes to travel the same distance during the northbound morning peak hour. With the project in 2040, it would take 29.3 minutes to travel the same distance and direction. When heading southbound in the afternoon peak hour period, it currently takes approximately 23 minutes. Without the project in 2040, the southbound afternoon peak hour trip is projected to take 34.7 minutes. With the project in 2040, the southbound afternoon peak hour trip would be approximately 24.5 minutes.

Table 2.17 highlights the savings in peak hour trip times expected with the project.

Table 2.17 Peak Hour Travel Time* (2040)

	Northbound Morning	Southbound Afternoon
Travel Time without Project	48.5 minutes	34.7 minutes
Travel Time with Project	29.3 minutes	24.5 minutes
Travel Time Savings with Project	19.2 minutes	10.2 minutes
Percent Reduction	39.6%	29.3%

Data from "SC 101 HOV Traffic Study forecast Operations Report" dated October 19, 2009 and errata sheet dated March 16, 2011
**Travel times shown for a roughly 20-mile trip (northbound or southbound) traveling on U.S. 101 between Linden Avenue and Los Carneros Road*

The peak hour peak-direction travel time for carpoolers and express bus riders in the HOV lanes is assumed to be equal to or better than the average travel time of others in the mixed-flow lanes.

Peak Period Vehicle Delay

Currently, there are 937 vehicle hours of delay during northbound peak period morning traffic and 871 vehicle hours of delay southbound during the afternoon peak period.

When adding the 154 vehicle hours of delay that occur during the southbound morning peak period to the 937 vehicle hours of delay that occur in the northbound direction, the total delay for the morning peak period amounts to 1,091 vehicle hours of delay. Conversely, when adding the 324 vehicle hours of delay that occur during the northbound afternoon peak period to the 871 vehicle hours of delay that occur in the southbound afternoon peak period, the total delay for the afternoon peak period amounts to 1,195 vehicle hours of delay. For both directions combined, there are currently (as of 2008) 2,286 total daily vehicle hours of delay.

In 2040, without the project, the expected delay for the northbound morning peak period would be 9,258 hours, and the expected delay for afternoon southbound peak period would be 3,383 hours. When adding the 1,507 vehicle hours of delay that occur during the southbound morning peak period to the 9,258 vehicle hours of delay in the northbound direction, the total morning peak period delay amounts to 10,765 vehicle hours. Conversely, when adding the 4,261 vehicle hours of delay for the northbound afternoon peak period to the 3,383 vehicle hours of delay in the southbound direction, the total amounts to 7,644 vehicle hours of delay for afternoon peak period. For both directions combined, there is an expected total of 18,409 daily vehicle hours of delay.

In 2040, with the project, the expected delay for northbound morning peak period travel would be 1,492 hours and the expected delay for southbound afternoon peak period travel would be 1,122 hours. When adding the 786 vehicle hours of delay for the southbound morning peak period to the 1,492 hours in the northbound direction, the total morning peak period delay amounts to 2,278 vehicle hours. Conversely, when adding the 3,574 vehicle hours of delay for the northbound afternoon peak period to the 1,122 vehicle hours of delay in the southbound direction, there is a total afternoon peak period delay of 4,696 vehicle hours. For both directions combined, there is an expected total of 6,974 daily vehicle hours of delay.

Table 2.18 highlights the savings in vehicle hours of delay expected with the project.

Table 2.18 Peak Period Vehicle Hours of Delay (2040)

	Northbound Morning	Southbound Morning	Southbound Afternoon	Northbound Afternoon	Total
Vehicle hours of delay without the project	9,258	1,507	3,383	4,261	18,409
Vehicle hours of delay with the project	1,492	786	1,122	3,574	6,974
Vehicle hours of delay reduction with the project	7,766	721	2,261	687	11,435
Percent reduction	83.9%	47.8%	66.8%	16.1%	62.1%

Data from "SC 101 HOV Traffic Study forecast Operations Report" dated October 19, 2009 and errata sheet dated March 16, 2011

Peak Period Person Hours of Delay

To determine person hours of delay, vehicle hours of delay are multiplied by the number of people in each vehicle. The traffic studies prepared for the South Coast 101 HOV project determined that currently there is an average of 1.27 persons per vehicle in the northbound and southbound morning peak period and 1.40 persons per vehicle during the northbound and southbound afternoon peak period.

With the project in 2040, it is estimated there would be an average of 1.65 persons per vehicle in the northbound/southbound morning peak period and 1.7 persons per vehicle during the southbound/northbound afternoon peak period. These slightly higher vehicle

occupancy numbers reflect the traffic studies assumption of an increase in carpoolers and transit riders.

In 2040, without the project, the South Coast 101 HOV traffic studies estimate an average of 1.38 persons per vehicle during the northbound and southbound morning peak period and 1.42 persons per vehicle during the northbound and southbound afternoon peak period.

Rather than show calculations for determining person hours of delay for each situation, an example is provided that shows how this information was calculated for the peak period travel conditions without the project in 2040. The calculation results are shown in Table 2.19.

The 1.38 persons per vehicle during the northbound morning peak period is multiplied by 9,258 (vehicle hours of delay) to get a total of 12,776 person hours of delay. For the southbound morning peak period, the 1.38 person per vehicle is multiplied by 1507 (vehicle hours of delay) to get a total of 2,080 person hours of delay during the southbound morning peak period. The 1.42 persons per vehicle in the southbound afternoon peak period is multiplied by 3,383 (vehicle hours of delay) to get a total of 4,804 person hours of delay during the southbound afternoon peak period. Conversely, for the northbound afternoon peak period, the 1.42 persons per vehicle is multiplied by 4,261 to get a total of 6,051 person hours of delay during the northbound afternoon peak period.

Comparing time savings of the build condition versus the no-build condition in 2040, the build condition would result in a person-hour savings of approximately 13,969 person hours. This number is the difference in the delay reduction with and without the project and represents an approximate 54 percent reduction in person hours of delay with the project.

Table 2.19 Person Hours of Delay during Peak Hour Travel Time (2040)

	Northbound Morning	Southbound Morning	Northbound Afternoon	Southbound Afternoon	Total
Person hours of delay without the project	12,776	2,080	6,051	4,804	25,711
Person hours of delay with the project	2,462	1,297	6,076	1,907	11,742
Person hours of delay savings with the project	10,314	783	-25	2,897	13,969
Percent reduction	80.7%	37.6%	-0.4%	60.3%	54.3%

Data from "SC 101 HOV Traffic Study forecast Operations Report" dated October 19, 2009 and errata sheet dated March 16, 2011

Intersection Analysis

Peak hour intersection analysis was also conducted at U.S. 101 interchange locations within the traffic study limits. A total of 104 intersections were analyzed within the 27.5-mile traffic study area. These intersections generally included ramp-junction intersections as well as adjacent intersections near the end of the ramp within the traffic study area. This analysis was completed to ensure that the project would not result in substantial changes to traffic levels at ramp junctions and local intersections. Many of the intersections in the study were outside of the project limits. The purpose of an expanded study was to determine the current conditions and to anticipate changes that could be brought about by the project as a result of traffic diversion and shifting traffic patterns. Peak hour intersection Delay, Level of Service, and 95th Percentile Queue were used as the main measures of effectiveness for intersection analysis.

The traffic studies show that, due to redistribution of traffic, the project would result in some changes to local traffic patterns at several ramp junctions off of the highway system.

Because this project would bring overall congestion relief to the corridor, the secondary impacts are not considered individually, but are part of the whole picture. Caltrans evaluated the overall delay in terms of context and intensity and found the impacts not significant. The overall regional traffic benefits would outweigh any minor intersection degradation. Except for modifications proposed at the Cabrillo Boulevard/Hot Springs Road interchange (discussed separately in the next section), no additional improvements

are proposed as part of this project to address the minor delay changes associated with future traffic redistribution within or outside the project limits.

During public review of the draft environmental document, several comments asked that additional details on the intersection analysis be included in this document. Previously, the information was available in the Forecast Operations Report, one of the traffic studies prepared for the project. The report was available online and at several local libraries along with all of the other technical studies prepared for the project. Figure 2-8 has been added to show the future level of service conditions for the evaluated intersections (information is from the Forecast Operations report). The figure has been divided into four sheets for the purposes of showing the entire traffic study limits, which are from south of Rincon Point/Bates Road interchange to north of the Hollister interchange in Goleta.

Of the 104 intersections evaluated in the Forecast Operations Report, nine intersections would be adversely affected by the project. However, it should be noted that these would not be considered significant under Caltrans standards. Caltrans evaluates delay in terms of context and intensity. Constructing the project would result in an overall reduction in delay to the U.S. 101 corridor. Small increases in delay at several intersections would not result from added traffic via new development, but instead would be the result of traffic moving more efficiently through the corridor and accumulating at some intersections faster than prior to the project. Because traffic forecasting relies on anticipating future local development many years out (2040), this is not easy to predict. For further discussion on evaluating the project's long-term impacts on intersections when considering local development, refer to Section 2.5, Cumulative Impacts.

Sheffield Interchange

It should also be noted that the level of service for the no-build scenario at Sheffield shows a shift of traffic onto North Jameson Lane when the parallel local street system is used during peak hours to avoid congestion on U.S. 101. Under the build scenario, traffic would use the Sheffield southbound ramps. Build-scenario delays increase by 9.4 seconds at the southbound ramp-junction intersection (#33) in the 2040 morning peak hours at LOS D. For all other peak hours in 2020 and 2040, delays increase at this intersection by less than 2 seconds at LOS C or better.

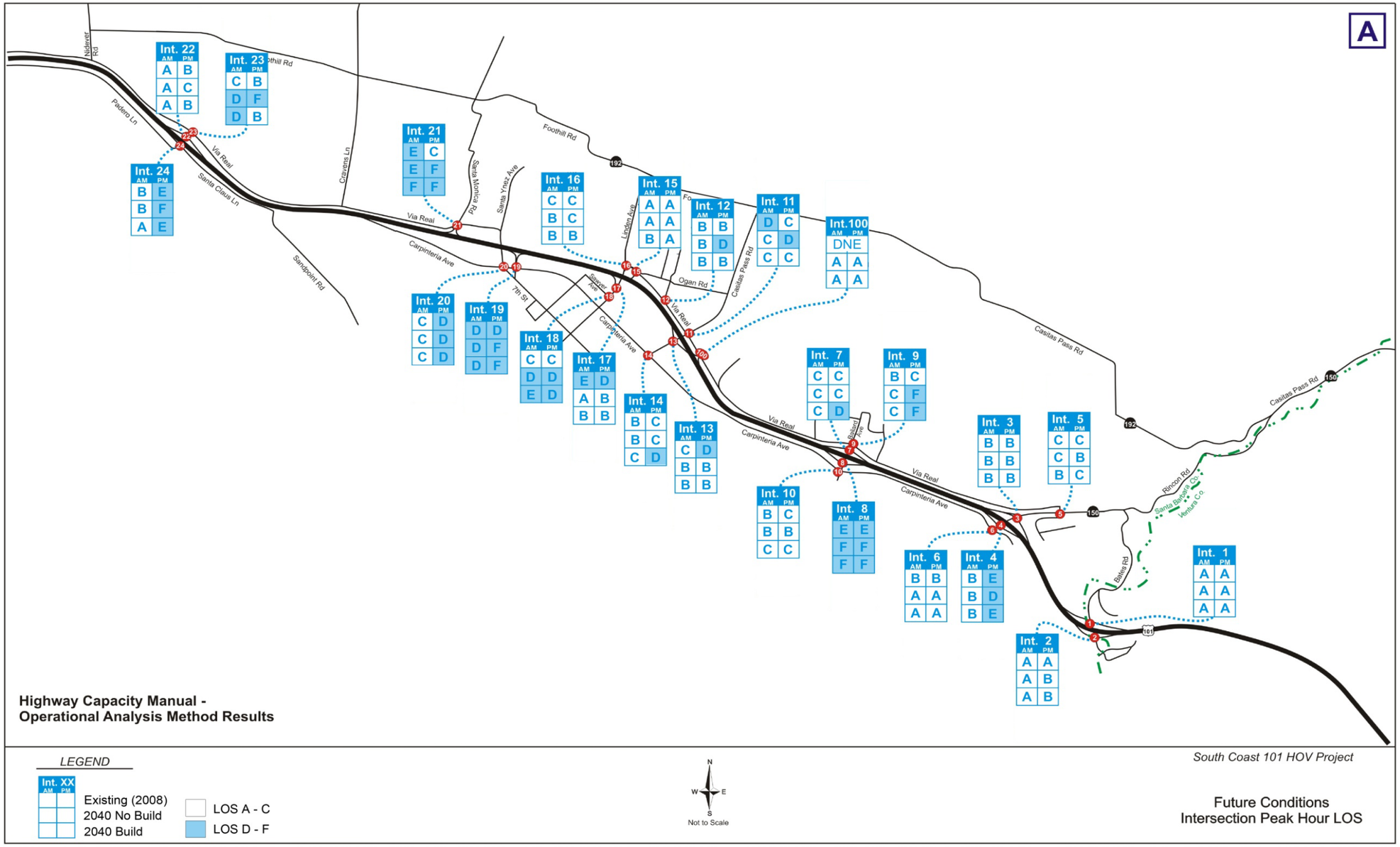

Figure 2-8 Future Conditions for Evaluated Intersections – Peak Hour Level of Service

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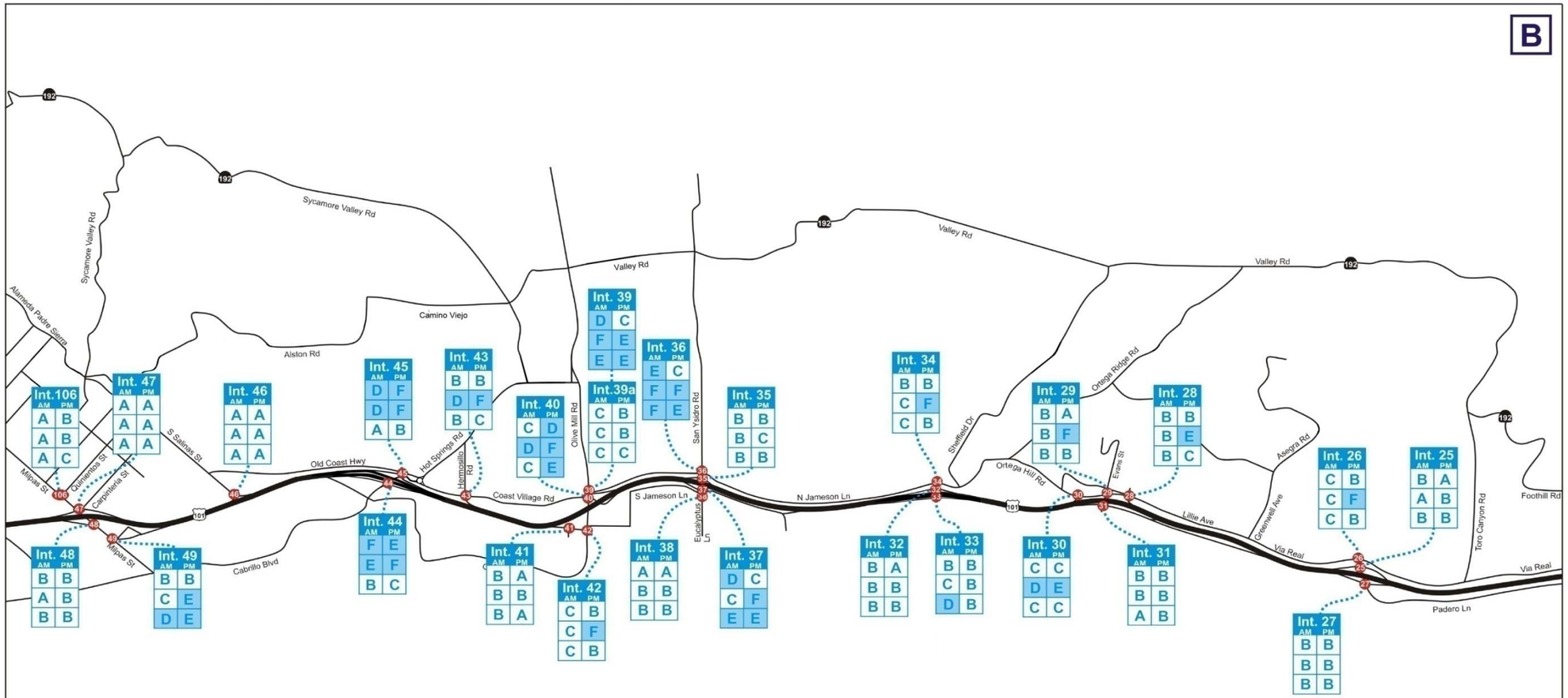
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Alameda Padre Serra
Camino Viejo
Alston Rd
Valley Rd
Old Coast Hwy
S Salinas St
Quintana St
Carpinteria St
Milpas St
Hot Springs Rd
Hermosillo Rd
Coast Village Rd
Olive Mill Rd
San Ysidro Rd
S Jameson Ln
N Jameson Ln
Eucalyptus Ln
Sheffield Dr
Ortega Ridge Rd
Ortega Hill Rd
Evans St
Lillie Ave
Greenwell Ave
Asegra Rd
Via Real
Toro Canyon Rd
Foothill Rd
Padero Ln
Cabrillo Blvd
Int. 106 AM A A A PM B B C
Int. 47 AM A A A PM A A A
Int. 46 AM A A A PM A A A
Int. 45 AM D D A PM F F B
Int. 43 AM B D B PM B F C
Int. 40 AM C D C PM D F E
Int. 39 AM D F E PM C E E
Int. 39a AM C C C PM B B C
Int. 36 AM E F F PM C F E
Int. 35 AM B B B PM B C B
Int. 34 AM B C C PM B F B
Int. 29 AM B B B PM A F B
Int. 28 AM B B B PM B E C
Int. 26 AM C C C PM B F B
Int. 25 AM B A B PM A B B
Int. 48 AM B A B PM B B B
Int. 49 AM B C D PM B E E
Int. 44 AM F E B PM E F C
Int. 41 AM B B B PM A B A
Int. 42 AM C C C PM B F B
Int. 38 AM A B B PM A B B
Int. 37 AM D C E PM C F E
Int. 32 AM B B B PM A B B
Int. 33 AM B C D PM B B B
Int. 30 AM C D C PM C E C
Int. 31 AM B B A PM B B B
Int. 27 AM B B B PM B B B
Highway Capacity Manual -
Operational Analysis Method Results
LEGEND
Int. XX AM PM
Existing (2008)
2040 No Build
2040 Build
LOS A - C
LOS D - F
N
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Not to Scale
South Coast 101 HOV Project
Future Conditions
Intersection Peak Hour LOS
(Continued)

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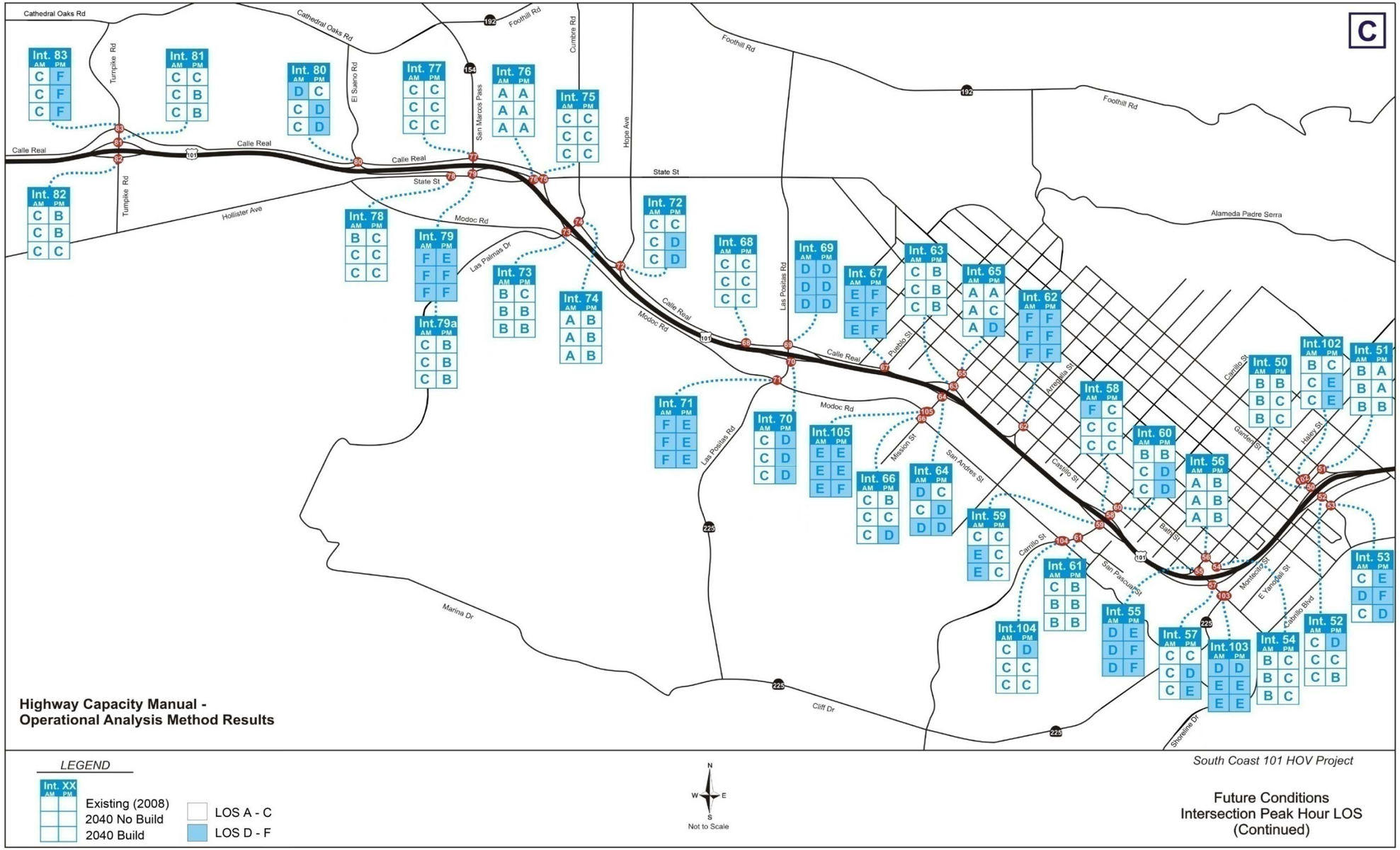
C
Highway Capacity Manual -
Operational Analysis Method Results
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Int. 80 AM PM D C C D C D
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Int. 76 AM PM A A A A A A
Int. 75 AM PM C C C C C C
Int. 82 AM PM C B C B C C
Int. 78 AM PM B C C C C C
Int. 79 AM PM F E F F F F
Int. 79a AM PM C B C B C B
Int. 73 AM PM B C B B B B
Int. 74 AM PM A B A B A B
Int. 72 AM PM C C C D C D
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Int. 69 AM PM D D D D D D
Int. 67 AM PM E F E F E F
Int. 63 AM PM C B C B C B
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Int. 58 AM PM F C C C C C
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Int. 56 AM PM A B A B A B
Int. 61 AM PM C B B B B B
Int. 104 AM PM C D C C C C
Int. 55 AM PM D E D F D F
Int. 57 AM PM C C C D C E
Int. 103 AM PM D D E E E E
Int. 54 AM PM B C B C B C
Int. 52 AM PM C D C C C B
Int. 53 AM PM C E D F C D
Int. 50 AM PM B B B C B C
Int. 102 AM PM B C C E C E
Int. 51 AM PM B A B A B B
Cathedral Oaks Rd
Foothill Rd
Turnpike Rd
El Sueno Rd
San Marcos Pass
Cumbre Rd
Hope Ave
Calle Real
State St
Hollister Ave
Modoc Rd
Las Palmas Dr
Las Positas Rd
Pueblo St
Arrequita St
Carrillo St
Garden St
Haley St
Mission St
San Andres St
Castillo St
Bath St
San Pascual St
Montecito St
E Yanonali St
Cabrillo Blvd
Shoreline Dr
Alameda Padre Serra
Marina Dr
Cliff Dr
LEGEND
Int. XX AM PM
Existing (2008)
2040 No Build
2040 Build
LOS A - C
LOS D - F
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South Coast 101 HOV Project
Future Conditions
Intersection Peak Hour LOS
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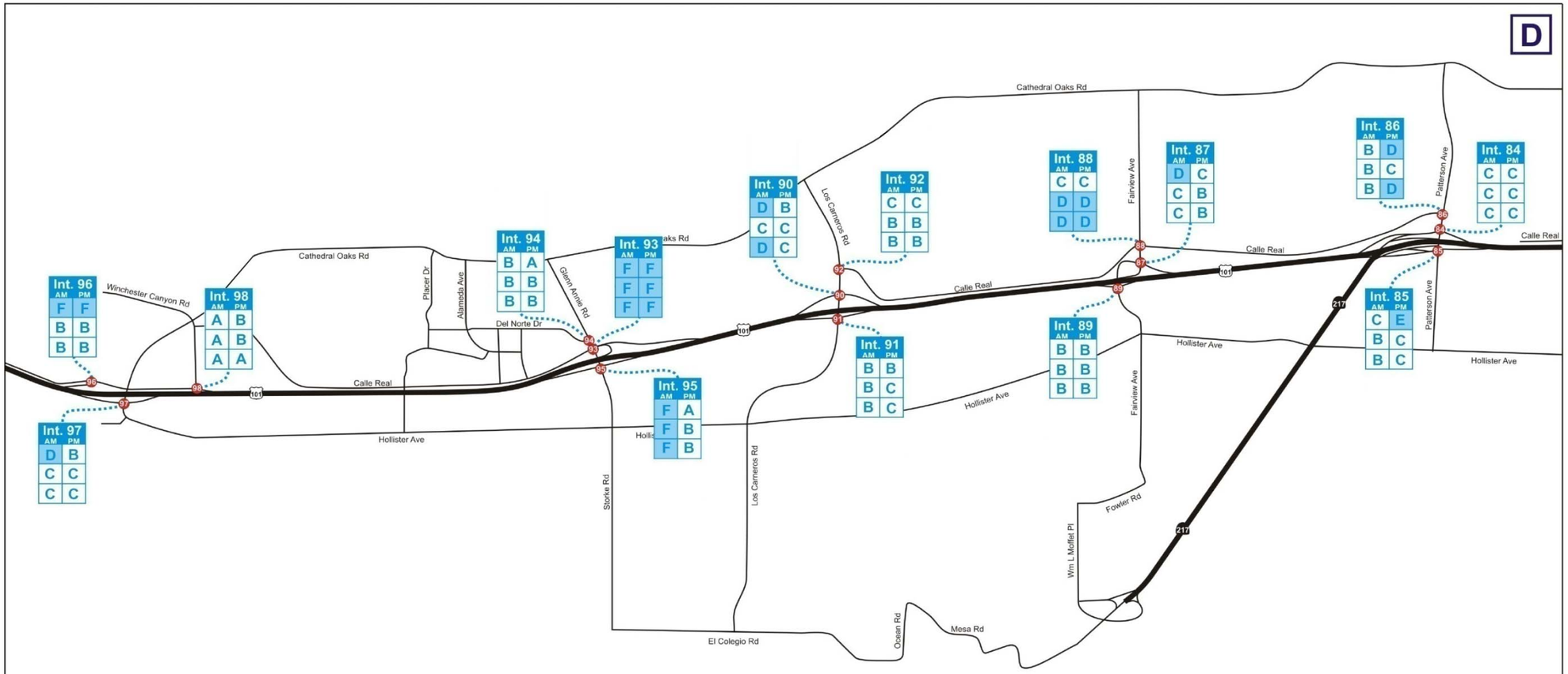

Highway Capacity Manual - Operational Analysis Method Results

LEGEND

Int. XX AM PM
Existing (2008)
2040 No Build
2040 Build

LOS A - C
LOS D - F

N W E S
Not to Scale

South Coast 101 HOV Project

Future Conditions
Intersection Peak Hour LOS
(Continued)

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Cabrillo Boulevard/Hot Springs Interchange

The five configurations that were considered for the proposed interchange each vary in terms of traffic redistribution. Refer to Section 1.3.1 for descriptions of each configuration. As mentioned earlier in the document, the F Modified configuration was recommended by the Project Development Team as the preferred configuration. Based on public feedback, F Modified also received major support from the public (see Appendix M).

A subset of intersections was chosen based on the overall number of interchange configurations considered for Cabrillo Boulevard. For the Hot Springs/Cabrillo interchange intersection analysis, primary and secondary intersections were identified. Projected turn volumes generated by the Santa Barbara County Association of Governments' travel demand morning/afternoon peak hour models were used to estimate intersection level of service relative to state and local operational criteria.

Primary locations were defined as being intersections physically altered by an interchange concept (design changes that are essential for putting an HOV lane on the mainline). Secondary locations were defined as intersections not physically altered but potentially affected by diverted traffic from primary intersection locations.

Based on the five configurations currently under consideration, three primary intersections and 11 secondary intersections were included in the study.

The following are the three primary intersections:

- Coast Village Road and Hermosillo Road: the northbound off-ramp
- Cabrillo Boulevard and the southbound off-ramp and northbound off-ramp
- Cabrillo Boulevard and the northbound on-ramp

The following are the 11 secondary intersections:

- Olive Mill Road and the northbound off- ramp
- North Jameson Lane and Olive Mill Road
- Olive Mill Road and the southbound on-ramp
- Milpas Street and the northbound on-ramp and off-ramp
- Milpas Street and the southbound off-ramp
- Milpas Street and the southbound on-ramp and off-ramp

- Garden Street and the northbound on-ramp and off-ramp
- Garden Street and the southbound on-ramp and off-ramp
- Garden Street and Yanonali Street
- Cabrillo Boulevard and Los Patos Way
- Cabrillo Boulevard/Hot Springs Road and Coast Village Road

Note that the intersections of Coast Village and the Hermosillo Road and northbound off-ramp were considered as a primary intersection under configurations F, J, and M. Under the modified configurations F and M, however, these intersections were redefined as secondary, given that they would remain physically unchanged relative to their baseline conditions.

Table 2.20 indicates level of service information for the primary intersections that would be rebuilt as part of this project. Level of service is a measurement similar to a report card that is used to evaluate how well intersections and roadways operate. This information covers the morning and afternoon peak hours for the No-Build Alternative and the build alternatives for the 2040 design year.

Three reconstructed ramp intersections (primary intersections) that may warrant traffic signals due to increased traffic as a result of the project are: the northbound ramp(s) at Cabrillo Boulevard, the southbound ramps at Cabrillo Boulevard, and the northbound off-ramp at Hermosillo Road and Coast Village Road. Configuration F Modified and configuration M Modified do not reconstruct the intersection of Hermosillo Road at Coast Village Road; therefore, this location is not considered a primary intersection for these two interchange configurations. The primary intersections for each of the interchange configurations that may warrant traffic signals are as follows:

- Configuration F
    - Hermosillo Road at Coast Village Road
    - Cabrillo Boulevard at the southbound ramps
- Configuration F Modified
    - Cabrillo Boulevard at the northbound ramps
    - Cabrillo Boulevard at the southbound ramps

- Configuration J
    - Hermosillo Road at Coast Village Road
- Configurations M and M Modified
    - Cabrillo Boulevard at the northbound ramps

As previously discussed, maintaining continuity of existing and future bike and/or pedestrian paths will be provided as a part of all interchange configurations.

One primary intersection—Coast Village Road and Hermosillo Road northbound off-ramp— is projected to exceed the Caltrans level of service threshold criteria during one or both peak hours for Cabrillo interchange configurations F and J in the year 2040.

The following secondary intersections are projected to exceed the Caltrans level of service threshold criteria for one or both peak hours:

- Southbound off-ramp and Olive Mill Road
- Southbound on-ramp and Olive Mill Road
- Southbound off-ramp and Milpas Street
- Southbound on-ramp and off-ramp and Milpas Street

For all the above intersections except for Cabrillo Boulevard and Los Patos Way, it was determined that no work would occur at any of these locations as part of the project due to the relatively minor increases in traffic and the uncertainty in predicting traffic redistribution patterns.

The intersection of Los Patos Way and Cabrillo Boulevard is projected to operate at level of service F during peak hours in 2040. No work is being shown at this location because the City of Santa Barbara has already included an intersection improvement project at this location in the 2014-2018 Capital Improvement Program. Caltrans would work with the City to ensure this improvement is completed before constructing the ramp changes for the proposed South Coast 101 HOV Lanes project.

Based on the Highway Capacity Manual (HCM) Two-Way Stop Controlled (TWSC) methodology, the intersection of Los Patos Way and Cabrillo Boulevard is projected to operate at level of service F during peak hours in 2040[9]. This methodology does not

[9]*Note:* Two-way stop control (TWSC) intersection level of service (LOS) is based on worst approach control delay per vehicle, using the 2000 Highway Capacity Manual methodology and therefore provides a single output that does not represent travel conditions for other intersection users. Conversely, all-way

effectively reflect the anticipated conditions for travelers on Cabrillo Boulevard, as most users of this intersection would experience little to no delay. Using a weighted average control delay methodology, similar to an approach used for traffic signals, this would instead represent a 2040 LOS value of "A" in the morning peak hour and LOS "B" in the afternoon peak hour. The northbound and southbound ramp junction intersection improvements associated with the preferred interchange configuration is also anticipated to reduce queuing that would otherwise extend back into the Los Patos/ Cabrillo intersection during peak times under the 2040 no-build condition.

The City of Santa Barbara has an intersection improvement project at this location in their 2014-2018 Capital Improvement Program. The area between the southbound ramp intersection (for the preferred F Modified configuration) at Cabrillo and the Los Patos/Cabrillo intersection is also the subject of bicycle and pedestrian improvements led by Santa Barbara County Association of Governments and the City of Santa Barbara. These improvements would improve bicycle and pedestrian connectivity along Cabrillo Boulevard by replacing the Union Pacific Railroad structure over Cabrillo Boulevard, providing bike and pedestrian facilities on both sides of Cabrillo Boulevard and controlled pedestrian crossing opportunities at the Los Patos/Cabrillo Boulevard intersection. A consultant that has experience working with Union Pacific Railroad has been hired by the City of Santa Barbara to complete this work, and the SBCAG board has identified this project as a priority improvement for regional funding.

The Caltrans team has coordinated with City and SBCAG staff to ensure that F Modified can be designed in a manner that provides for bicycle, pedestrian, and vehicular connectivity and consistency with the SBCAG/City improvement project. Caltrans will coordinate closely with the City and SBCAG on these improvements during the design and permitting phase of the HOV project and options for shared funding and/or concurrent construction efforts will be further discussed at that time.

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stop and signal controlled intersection LOS in the 2000 Highway Capacity Manual is based on weighted average control delay per vehicle. At the Los Patos/Cabrillo intersection, the low LOS value indicated by the TWSC methodology is based on a limited number of vehicles making left turns that would experience a 95th percentile queue of 2-4 vehicles in 2040 from the side streets. Vehicles traveling through the intersection on Cabrillo Boulevard, however, would experience little to no control delay. Under F Modified, if no further improvements were made at this intersection apart from this project, the average vehicle control delay in 2040 for vehicles that travel through this intersection would be 3.1 seconds/vehicle in the morning peak hour and 12.1 seconds/vehicle in the afternoon peak hour. Using a weighted average control delay methodology, this would represent a 2040 LOS value of "A" in the morning peak hour and LOS "B" in the afternoon peak hour.

Table 2.20 Primary Intersection Level of Service Summary

Location and Intersection Number	Existing		No-Build		Cabrillo Interchange F		Cabrillo Interchange F Modified		Cabrillo Interchange J		Cabrillo Interchange M		Cabrillo Interchange M Modified	
	2008		2040		2040		2040		2040		2040		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Southbound and northbound off-ramps (left) #44 at Cabrillo Blvd.	F	E	D	C	-	-	- -	- -	- -	- -	- -	- -	- -	- -
Southbound on- and off-ramps (right) #44 at Cabrillo Blvd.	B	D	- -	- -	C	C	B	C	- -	- -	- -	- -	- -	- -
Northbound on-ramp #45 at Cabrillo Blvd.	D	F	A	C	B	D	- -	- -	B	D	- -	- -	- -	- -
Northbound on- and off-ramps #45 at Cabrillo Blvd.	-	-	- -	- -	- -	- -	A	B	- -	- -	B	B	B	B
Northbound off-ramp (right) #43 at Hermosillo Road	C	F	C	F	B	C	*	*	B	C	- -	- -	*	*

Data from "Cabrillo/Hot Springs Interchange Configuration Traffic Analysis," March 21, 2011, and "Memorandum Cabrillo Boulevard I/C Modified Configuration Analysis" dated July 19, 2011, "South Coast 101 HOV Lanes Existing Conditions Operations Analysis" (December 15, 2008; amended December 9, 2011, and "South Coast 101 HOV Lanes Forecast Operations Report of October 19, 2009" (amended December 9, 2011). Addendum to July 19, 2011Cabrillo/Hot Spring Interchange Configuration Analysis Technical Memorandum –I/C Modified Configuration Analysis (March 14, 2014)

Table amended since release of draft environmental document to remove 2020 data based on decision that the project would not be fully constructed by that date.

*Notes: * Not a primary intersection*
Proposed intersection location and/or lane configurations vary by interchange concept for intersections #44, #45, and #107

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Bicycle and Pedestrian Routes

None of the three build alternatives would permanently affect parking, bicycle, or pedestrian facilities, including the Pacific Coast Bike Route. Where the project is proposing local-street changes, all modified pedestrian facilities would comply with the Americans with Disabilities Act. The project would facilitate pedestrian and bicycle access by ensuring all existing bicycle and pedestrian facilities are retained or replaced as needed. Building the six-lane highway would reduce through-trips by vehicular traffic on the local street system by those seeking to avoid U.S.101 congestion. In areas where traffic trips onto the local streets are reduced, there would be added benefits for bicycle, pedestrian and local transit users that depend on the local street system for travel.

In several locations within the project limits, bicycle and pedestrian improvements are desired by the local agencies and have been included as part of circulation plans. Desired improvements include access structures to cross over or under the freeway. Although the South Coast 101 HOV Lanes project would not construct those new facilities as part of its project or scope, it would not preclude the facilities from being constructed as planned.

As a result of the recent Local Coastal Plan Amendment process with the City of Carpinteria, two additional projects have been identified in the Carpinteria area that would provide greater connectivity in the city for the Coastal Route Bike Path. The first project proposes to extend the bike path adjacent to the Salt Marsh from Santa Claus Lane to Carpinteria Avenue. This Class I path proposes to close the coastal trail gap. The second project is the Rincon Coast Trail that would extend from Carpinteria Avenue to Rincon County Park. The proposed improvement will close the coastal trail gap between Carpinteria Avenue and the new Class I trail along U.S. 101 at Rincon. Currently, the Santa Barbara County Association of Governments has been identified as the lead agency for both projects. Both trails are expected to be built before completion of the South Coast 101 HOV Lanes project.

During construction of the Cabrillo Boulevard/Hot Springs interchange, consideration would be given to bicyclists, pedestrians, and persons with disabilities who need access through construction areas. Nearby is the existing Butterfly pedestrian undercrossing. Entrance points to the pedestrian undercrossing were improved as part of the Milpas Street/Hot Springs Road project. Further improvements to provide full Americans with Disabilities Act accessibility are also being considered as part of a Caltrans candidate SHOPP funded project. With Cabrillo Boulevard interchange configurations F

Modified, M, and M Modified, access or use of this facility would not be diminished, however, the existing light well in the center would be closed. For interchange configurations F and J, in addition to the closure of the light well, the Hermosillo ramp would be widened in this location, requiring a change to the eastern approach of the undercrossing structure. Provisions would be made to keep the overcrossing open for use during construction.

As noted earlier, the area between the Proposed F Modified southbound ramp intersection at Cabrillo and the Los Patos/Cabrillo Boulevard intersection is also the subject of bicycle and pedestrian improvements being completed by SBCAG and the City of Santa Barbara. The SBCAG/City of Santa Barbara projects propose to improve bicycle and pedestrian connectivity along Cabrillo Boulevard by replacing the Union Pacific Railroad structure over Cabrillo Boulevard, providing bike and pedestrian facilities on both sides of Cabrillo Boulevard and controlled pedestrian crossing opportunities at the Los Patos/Cabrillo Boulevard intersection. The Caltrans team has coordinated with the City of Santa Barbara and SBCAG staff to ensure that F Modified can be designed in a manner that provides for bicycle, pedestrian, and vehicular connectivity when the SBCAG/City of Santa Barbara improvement project is completed.

Avoidance, Minimization, and/or Mitigation Measures

- Coordinate with local jurisdictions as needed to minimize disruptions to traffic, pedestrians, and bicyclists associated with local and state road construction projects in the corridor. Refer to Construction Impacts under Traffic Circulation (including pedestrian and bicycle) for further details regarding a required Transportation Congestion Management Plan.
- Where the project proposes local street changes, all modified pedestrian facilities would comply with the Americans with Disabilities Act.
- All existing bike or pedestrian facilities would be retained or replaced as needed.

2.1.6 Visual/Aesthetics

Regulatory Setting

The National Environmental Policy Act of 1969 as amended establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S. Code 4331[b][2]). To further emphasize this point, the Federal Highway Administration in its