Chapter 3 Affected Environment, Environmental Consequences, and Avoidance, Minimization and/or Mitigation Measures

3.1 Human Environment

3.1.1 Introduction

This section addresses all aspects of the human environment. These aspects include land use, growth, community character and cohesion, transit and parking, traffic and circulation, aesthetics, and cultural resources. The section describes the development pattern along the US 101 corridor, provides a socioeconomic profile of the communities adjoining or traversed by US 101, characterizes the transportation network that provides people and goods movements and how well it functions, and describes the visual and cultural landscape that imparts character and history to the corridor.

3.1.2 Land Use

3.1.2.1 Regulatory Setting

The regulatory framework for land use is governed by local general plans prepared by cities and counties in accordance with the state government code. State law requires that each general plan address seven topics, ranging from land use to housing to open space. Applicable plans related to land development are described here. In addition, because of the strong nexus among land use, transportation, and air quality, some of the important state and regional plans addressing these topics are also summarized below.

Local Land Use Plans

Marin Countywide Plan. The Marin Countywide Plan advocates concentrating urban development in the "City-Centered Corridor," one of the County's four development corridors, located along US 101 in the eastern part of the county near San Francisco and San Pablo Bay. As envisioned in the Plan, city- and community-centered growth helps to promote economic efficiency, protect natural resources, and preserve existing communities in rural and coastal areas to ensure that a range of living options remain available in the County as a whole.

On January 30, 2007, the Marin County Board of Supervisors and the Planning Commission approved a public hearing schedule to review and discuss the update to the 1994 Countywide Plan. This process culminated in the adoption of a revised Marin Countywide Plan on November 6, 2007; however, the fundamental land use objectives and development principles remain as stated in the 1994 Countywide Plan.

Because much of the land use character of the MSN corridor between Novato and Petaluma is rural, protection of the visual quality and rural landscape was an important consideration in developing the mainline alternatives and Access Options. The value of the area's scenic beauty is underscored by the Plan that contains the following policies:

- **Viewshed Protection.** The County shall protect visual access to the bayfront and scenic vistas of water and distinct shorelines through its land use and development review procedures. This view protection is essential for the preservation of Marin County and San Francisco Bay identity, for the enhancement of aesthetic qualities, and for visual and psychological relief from adjacent urban environments.
- **Minimize Visual Impacts of Public Facilities.** The County should require appropriate placement, setbacks, and landscaping of public facilities, such as soundwalls, to reduce visual impacts and impacts on views of hillsides, ridgelines, open space, and the Bay. The County encourages similar measures to reduce visual impacts for public projects over which it does hot have jurisdiction.

City of Novato General Plan. Land use goals of the City of Novato General Plan are to:

- Preserve the small town character and environmental needs of the Novato community; and
- Develop effective transit services and infrastructure.

The major objectives of the Plan include:

- Increase the capacity of the existing transportation system to support current and future development;

- Coordinate effectively with neighboring jurisdictions and special authorities, such as the Transportation Authority of Marin; and
- Address countywide transportation problems and maintain transportation standards.

Sonoma County General Plan. The Sonoma County General Plan 2020 was adopted in September 2008. Primary goals of the Land Use element of the Sonoma County General Plan are to coordinate land use with growth policies, phase rural and urban growth with availability of adequate services, provide open space separation between cities/communities, create opportunities for diverse rural and urban residential environments, protect agricultural lands, and preserve scenic features and biotic resource areas.

The following policies that appear in the general plan are examples of the value that Sonoma County places on scenic resources:

- Encourage protection of visual access to the San Pablo Bay Shoreline and the Petaluma River; and
- Protect visual values on hillsides, ridgelines, and other scenic resources.

Sonoma County Comprehensive Transportation Plan. The primary goal of the Sonoma County Comprehensive Transportation Plan for 2004 is to provide a well-integrated circulation system that supports “smart” growth principles and the city-centered growth philosophy, through a collaborative effort of all the cities and the County. Primary objectives to obtain this goal include:

- Focusing commute and through traffic onto US 101 and designating major arterial routes to serve primarily as connectors between urban areas; and
- Providing east/west connectivity within each community including interchange improvements to improve access to US 101.

City of Petaluma General Plan. The Petaluma Draft General Plan 2025 was released for review in July 2006, and was adopted May 2008. Land use objectives in the General Plan include promoting architectural and socioeconomic diversity within residential areas and establishing a realistic ratio between East Side and West Side growth. Policies set forth by the general plan to obtain these objectives include:

- The City's growth management system shall be updated and revised from time to time;
- The City would not guarantee that any individual project will be able to achieve the maximum densities shown on the Land Use Map;
- Those parcels that are undevelopable shall continue to be identified and so designated on the City's plans;
- Minimize the impacts of future airport development on nearby residential areas;
- Improve traffic flow; and
- Plan long-range for needed roads and infrastructure.

Key Transportation Plans

The MSN Project is being proposed in partnership with TAM, SCTA, and FHWA. The completion of the HOV system through Marin and Sonoma Counties has been studied in regional planning documents such as the Sonoma/Marin 1997 Multi-Modal Transportation & Land Use Study (Calthorpe Study) and the Marin County Congestion Management Plan.

The Calthorpe Study. The Calthorpe Study advocated the creation of a balanced transportation network throughout Marin and Sonoma Counties. The Final Preferred Scenario included transit improvements as well as improvements to US 101 and local roads. Although the improvement of US 101 from expressway to freeway status between Novato and Petaluma was part of the Study, it was not part of the recommended Final Preferred Scenario, as it failed to demonstrate that such an improvement would significantly improve levels of service for commuters within the segment. The relatively high cost of the upgrading ($125 million) was another reason for its exclusion from the Final Preferred Scenario. However, the addition of HOV lanes in Marin and Sonoma Counties were part of the Preferred Scenario.

The Marin County Congestion Management Plan. US 101 has been operating at unacceptable levels since the very first Congestion Management Plan in 1991. The MSN Project is identified in the 2005 Congestion Management Program as a "candidate for future funding." The Congestion Management Program notes that projects that support or help implement Transportation Control Measures in the Bay Area's Clean Air Plan should receive higher funding priority. Examples of

such projects include high-occupancy vehicle lanes and ramp meter bypass lanes for high-occupancy vehicles. The MSN Project includes both of these measures.

Route Concept Report. The MSN Project is consistent with the current Route Concept Report and the current draft of the Transportation Corridor Concept Report.

Transportation System Development Plan. Caltrans developed a Statewide System Management Plan (1998) that includes a strategy for Bay Area transportation corridors. This study found that congestion relief in the US 101 corridor would require a multi-modal (carpool, bus, rail, ferry, bicycle, and pedestrian) approach.

MTC Transportation 2030 Plan. The MSN Project is listed as a Track 1 project in the Golden Gate Corridor section of the current MTC Transportation 2030 Plan for the San Francisco Bay Area (see Appendix L). The Congestion Management Plan identifies the following objectives:

- Maximize travel time benefits for high-occupancy vehicle lanes and transit in entire (Golden Gate) corridor;
- Protect operational capability of reliever routes to US 101 for short trips during the peak period;
- Maintain interchange spacing and ensure improvements to connecting east-west routes do not adversely affect operations on US 101;
- Develop ramp-metering plan for US 101 at key access points to balance access for local and through trips;
- Maintain reliable US 101 operations in off-peak period for freight mobility;
- Expand commute-period transit options in (the Golden Gate) corridor;
- Improve transit service between cities;
- Develop bicycle and pedestrian travel options for commuting, recreation and tourism; and
- Develop bicycle and pedestrian access to existing and future rail and ferry facilities.

Air Quality Plan

The Bay Area Air Quality Management District's 2000 Clean Air Plan contains strategies to achieve air quality standards. A list of Transportation Control Measures (TCM) is recommended to be implemented to reduce vehicle emissions. Transportation Control Measure 8 in the Plan is to construct carpool/express bus lanes on freeways.

3.1.2.2 Affected Environment

Land uses within the cities of Novato and Petaluma are primarily residential, commercial, industrial, and open space. In Segment B of the project corridor along both sides of US 101 between the Novato and Petaluma city boundaries, land use is predominantly agricultural. Figure 3.1-1 shows existing land uses throughout the US 101 corridor within the MSN Project boundaries. Following is a description of existing and future land uses and trends.

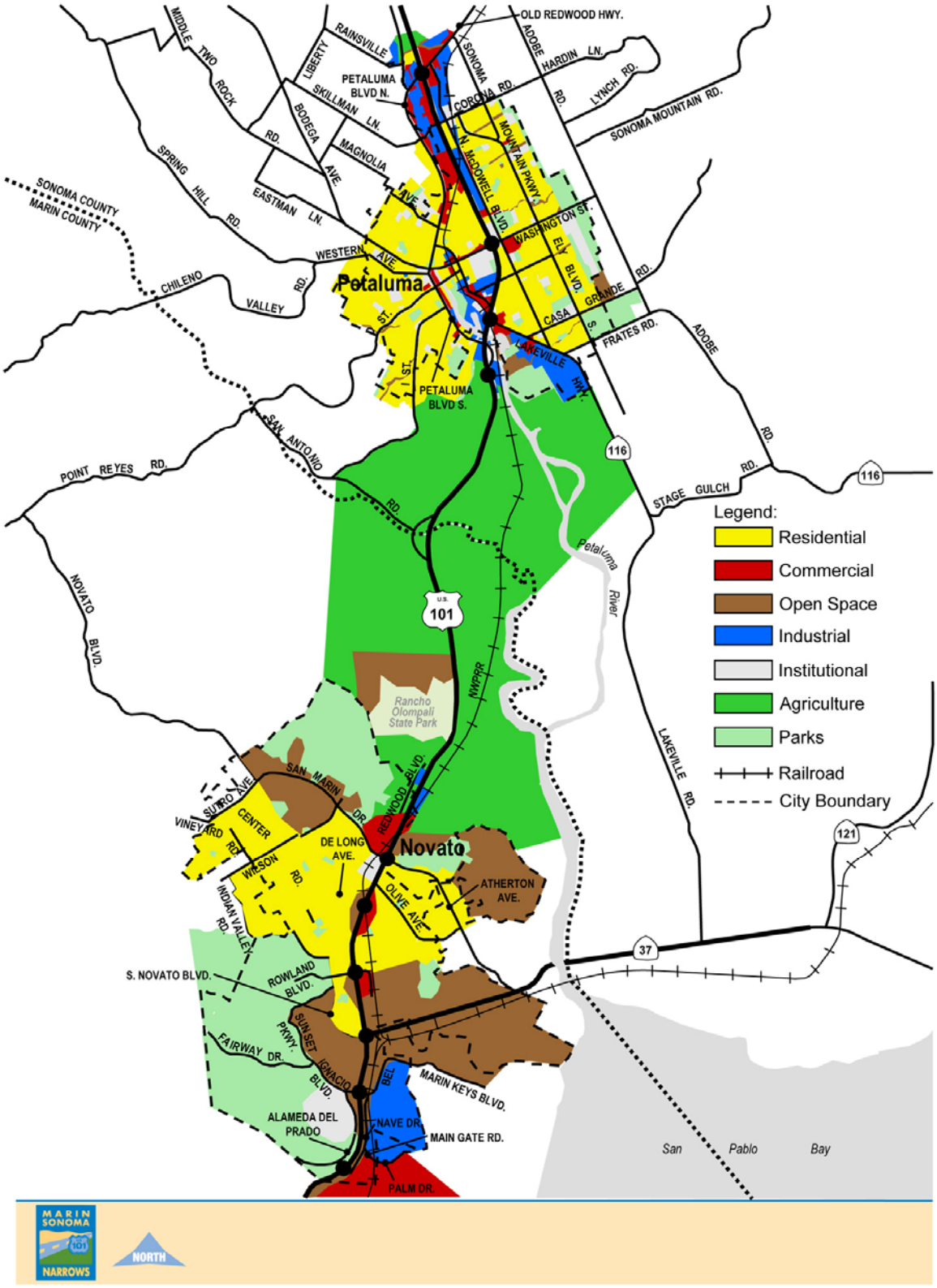
Existing Land Use and Trends

From the southern project boundary to the US 101/South Novato Boulevard Interchange, existing land use is predominately residential in the valley areas west of US 101 and in pockets along San Pablo Bay east of the freeway. The College of Marin-Indian Valley is located west of the freeway, near Ignacio Boulevard; Stonetree Golf Club is located east of the freeway, south of SR 37.

Commercial uses in downtown Novato are concentrated along Grant Avenue, along Redwood Boulevard, in pockets along US 101, and in various small clusters and convenience centers. The Vintage Oaks Shopping Center is located east of the highway and south of the Rowland Boulevard Interchange, in the Novato Redevelopment Project Area.

Offices are located along the freeway, in and around downtown Novato, near the Novato Community Hospital, along Novato and South Novato Boulevards, and within the industrial parks. Novato Industrial Park contains the bulk of the City's warehousing, distribution, and manufacturing uses. Several industrial operations remain near the downtown, between the railroad and Redwood Boulevard.

Figure 3.1-1 Existing Land Use



Between the US 101/San Marin Drive—Atherton Avenue Interchange and the US 101/San Antonio Road intersection, land uses are primarily agricultural and open space. Valley Memorial Park and the Marin County Airport/Gnoss Field are located east of the highway; Rancho Olompali SHP and the Institute of Noetic Sciences are located to the west of the highway.

Land in the vicinity of San Antonio Road, at the border of Marin and Sonoma Counties, is currently scarcely populated. There are a few houses on relatively large parcels of land and a few small business establishments.

West of the US 101/Petaluma Boulevard Interchange, land uses include residential and commercial. The Petaluma Golf and Country Club is located west of the highway and south of Petaluma Boulevard.

Between SR 116 and the northern project boundaries at Old Redwood Highway, land uses are residential, commercial, and open space west of US 101. Cypress Hill Cemetery is located west of the highway near Petaluma Boulevard. East of US 101, land uses are residential, commercial, industrial, and open space. Petaluma Adobe State Historic Park, Adobe Creek Golf Course, Petaluma Municipal Airport, Rooster Run Golf Club, Petaluma Valley Hospital, and the Santa Rosa Junior College Petaluma Campus are located in this area.

Future Land Use

Based on the Association of Bay Area Government's (ABAG) Projections 2005, Marin County is expected to gain 15,500 households and 36,400 residents between 2000 and 2030. This is one of the slowest population growth rates in the Bay Area region. One factor limiting Marin's population growth is the County's aging population; another is its low average household size.

Sonoma County's population increased considerably between 1990 and 2000. By 2000, the County had reached a population of over 458,000. However, Projections 2005 forecasts that the rate of population growth will slow considerably over the next 30 years. Between 2000 and 2030, Sonoma County is expected to add over 41,400 households and almost 100,000 residents. However, in 2030, Sonoma County will be home to a smaller share of the region's population than it was in 2000. Nearly half of the households that will be added from 2000 to 2030 will be in Santa Rosa, north of the MSN Project area.

Between 2000 and 2030, the City of Novato is projected to have the highest residential growth in Marin County, adding over 5,500 households and 13,800 residents. The City of Novato General Plan, revised March 2003, projected 27,000 housing units at buildout, which was expected to occur by 2015. Population at buildout was estimated to be 66,400.

The City of Petaluma is projected to have the second highest growth rate in Sonoma County, adding 4,178 households during this period. The City of Petaluma General Plan: 1987-2005, revised 1990, projected 16,831 dwelling units in 1990. Nearly 80 percent of dwelling units were single-family units (including mobile homes), with approximately 20 percent in multi-family developments. According to the general plan, buildout of commercial and office, industrial, and public space (schools, parks and agricultural land) sites within the City of Petaluma would result in approximately 600,000 square meters (m^2) [6.5 million square feet (ft^2)] of commercial and office uses, 2.2 million m^2 (23.7 million ft^2) of industrial uses and 1.9 million m^2 (20.6 million m^2) of public uses.

Table 3.1-1 lists major approved and proposed projects in the MSN study area. The locations of these projects are shown in Figure 3.1-2.

3.1.2.3 Impacts

Land Use Compatibility

Fixed HOV Lane Alternative. Impacts under this Preferred Alternative will require some commercial and agricultural land to be converted to transportation use (Table 3.1.2), the Fixed HOV Lane Alternative would not alter land use patterns. Farmland impacts are more fully discussed in Section 3.1.5.

The land use pattern in Segments A and C is predominantly urban and reflects a mix of residential and commercial uses primarily. In these segments, the MSN Project proposes the addition of an HOV lane in each direction within the existing US 101 median. There would be some widening outside the existing right-of-way in Petaluma (Segment C); however, these changes to US 101 would not interfere with existing land uses nor impede local planning policies concerning future land development since there is relatively little land acquisition or displacement associated with the Fixed HOV Lane Alternative (see further details in Section 3.1.6, Community Character and Cohesion).

Table 3.1-1 Major Approved and Active Projects in the Study Area

No.	Project Name	Address	Approved ha/ac	Approved Use	Project Status
City of Novato (November 2008)					
1	Binford Road Storage Facility	8190 Binford Road	2.29 / 5.67	Commercial	Under Review
2	Costco Expansion	300 Vintage Way	0.33 / 0.80	Commercial	Under Construction
3	Creekside Office	1744-1748 Novato Boulevard	0.12 / 0.28	Commercial	Completed Construction
4	Marion Heights	1750 Marion Avenue	3.02 / 7.47	Residential	Completed Construction
5	New Beginnings Next Key	1399 North Hamilton Parkway	0.02 / 0.05	Mixed Use	Under Construction
6	Oleander Lane Design Review	1 Oleander Lane	5.52 / 13.65	Residential	Approved
7	Olive Court	469 Olive Avenue	1.77 / 4.38	Residential	Under Construction
8	San Pablo Subdivision	San Pablo Avenue/ Hangar Avenue	1.27 / 3.13	Residential	Completed Construction
9	Somerston Park (Marion Heights)	Northside of Marion Avenue between Anna Court and Bryan Drive	4.29 / 10.60	Residential	Under Construction
10	Oak Ridge Estates	End of Shevelin Road	13.84 / 34.19	Residential	Updating EIR; Waiting on Approval
11	Whole Foods/Mixed Use	790 Delong Avenue	0.50 / 1.23	Mixed Use	Under Construction
12	Woodview Subdivision	San Marin Drive/Dorothy Way	7.57 / 18.70	Residential	Under Construction
County of Sonoma (April 2009)					
13	Dutra Asphalt & Recycling Facility	3355 Petaluma Blvd. South	15.38 / 38	Industrial	Out for Public Comment
14	Royal Petroleum	2645 & 2525 Petaluma Blvd. South	0.93 / 2.3	Commercial	Approved; In design
15	Shamrock	210 & 222 Landing Way	2.43 / 6	Industrial	Completed Construction
16	Novato Disposal	2543 Petaluma Blvd. South	2.18 / 5.39	Industrial	Approved
City of Petaluma (December 2005 & November 2008)					
17	Intersection widening and signalization	Adobe Road and Corona Road Intersection	N/A	Traffic Improvement	Approved
18	Boulevard Apartments	945 Petaluma Boulevard North	N/A	Residential	Completed Construction
19	Deer Creek Plaza	NW side of N. McDowell/ Ranier Ave. Intersection	14.57 / 36	Mixed Use	Process of being revised to new General Plan of Mixed Use
20	Lafferty Ranch Park	3.5 miles from Petaluma	109.27 / 270	Recreation	On Hold
21	Magnolia Place	Magnolia Avenue, Near Cemetery	9.87 / 24.4	Residential	Completed Construction
22	Marina Office Building	785 Baywood Drive	0.30 / 0.73	Office	Approved
23	McDowell/E. Washington	McDowell and E. Washington Intersection	N/A	Traffic Improvement	Completed
24	Park Square	Casa Grande Road at Lakeville Street	0.21 / 0.52	Residential/ Office	Retail portion under construction. Residential portion completed.
25	Petaluma Theater District	First and Second Streets at C and D Streets	0.48 / 1.19	Commercia/ Residential	Approved
26	Recycled Water Pipeline Phase I	Browns Lane/Ely Road/Casa Grande Road	N/A	Utility	EIR in process
27	Redwood Technology Center	Old Redwood Highway and W. McDowell Blvd	5.83 / 14.4	Office	Under Construction

Table 3.1-1 Major Approved and Active Projects in the Study Area

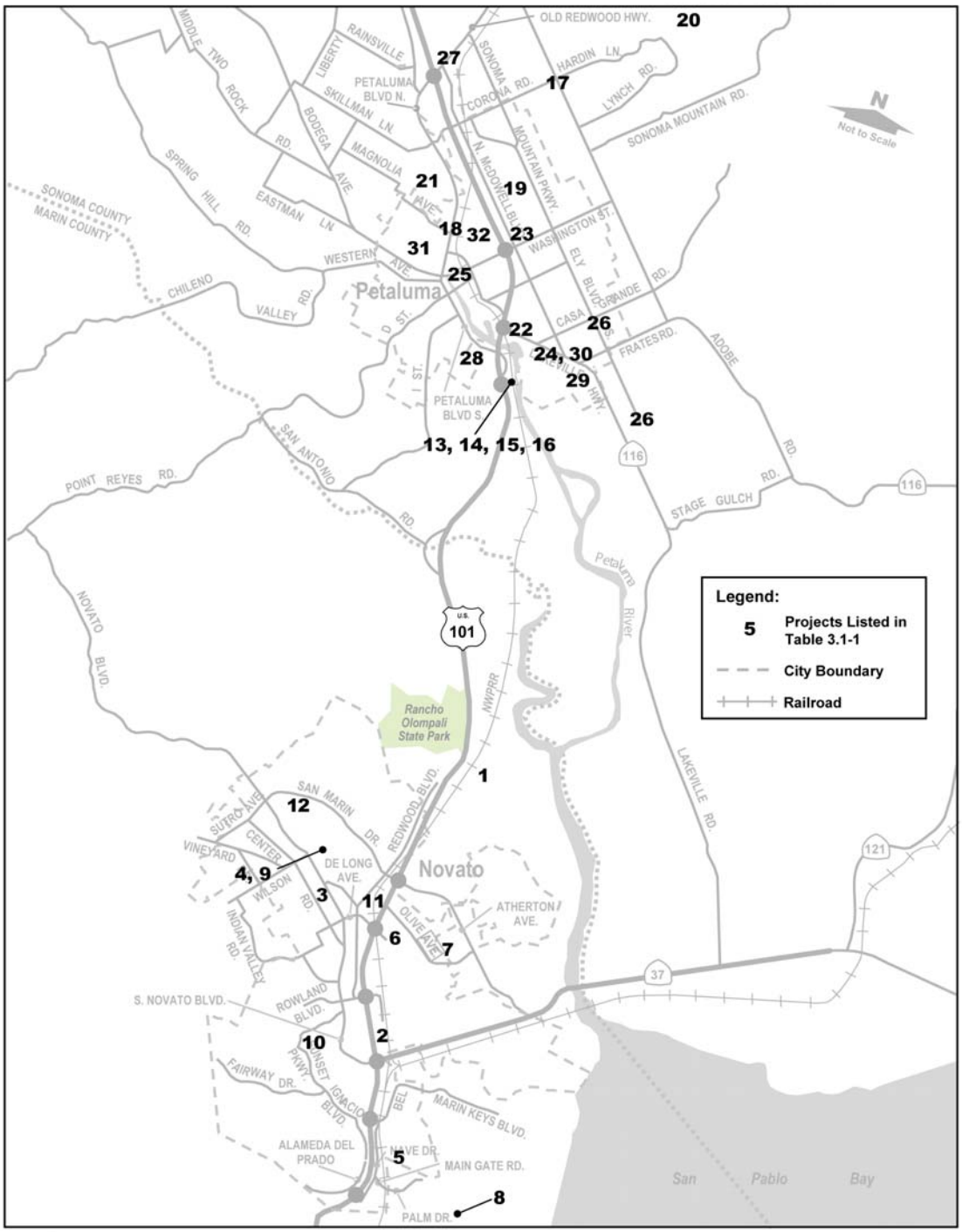
No.	Project Name	Address	Approved ha/ac	Approved Use	Project Status
28	Riverview Subdivision	Mission Drive near McNear Avenue	7.28 / 18.00	Residential	Under Construction
29	Sola Business Park	1490 Cader Lane	3.29 / 8.14	Office	Completed Construction
30	Technology Lane Commercial Center	Technology Lane	0.37 / 0.92	Office	Completed Construction
31	Sweed School	331 Keller Street		Residential	Completed Construction
32	East Washington Place	East Washington and Ellis Streets	13.35 / 33	Office/Mixed Use	EIR in preparation

Sources:

Marin County Community Development Agency, *Propdev 40 Semi-Annual Proposed Development Survey*, October 2005. City of Novato Planning Department, November 2005 & November 2008.

City of Petaluma Community Development Department, Planning Division, December 2005 & November 2008. County of Sonoma, April 2009

Figure 3.1-2 Major Approved and Proposed Projects in the MSN Study Area



Note: Not to scale.

In Segment B, the Fixed HOV Lane Alternative would convert the existing expressway to a freeway. The requisite roadway widening to accommodate this conversion would affect farmlands, open space, undeveloped lands, and thus, would alter the land use pattern in this reach. The predominantly rural land uses, however, would continue to define Segment B in accordance with the land use policies for Marin and Sonoma Counties in the unincorporated areas. The most notable change in Segment B would be the increased views of roadway infrastructure, which is discussed in Section 3.1.11, Visual/Aesthetics.

The future land use trends, as forecast by ABAG and defined by Marin and Sonoma Counties, suggest additional growth in Sonoma County, particularly in Petaluma. The Fixed HOV Lane Alternative would not impede that land use trend nor cause a shift from the land use pattern planned for by the local jurisdictions.

Reversible HOV Lane Alternative. Like the Fixed HOV Lane Alternative, the Reversible HOV Lane Alternative would convert some commercial and agricultural land to transportation use. The Reversible HOV Lane Alternative would result in land use impacts identical to those described for the Fixed HOV Lane Alternative. Specifically, the Reversible HOV Lane Alternative would not alter existing or future land use patterns.

Access Options. Land use impacts by Access Option would be similar, although each Access Option would vary in the amount of farmland, open space, or undeveloped land affected. Predominantly rural land uses, however, would continue to define Segment B regardless of which Access Option is implemented, and therefore the Access Options would not alter land use patterns in that they would not impede or interfere with the routine operations and activities conducted by the existing uses. Rather than interrupt these activities, the Access Options would ensure that local and major traffic movements continue to be served, that access to existing uses is maintained, that occasional overcrossings are provided to foster mobility, and that a continuous bicycle/pedestrian pathway is provided.

No Build Alternative. The No Build Alternative would have no effect on existing land uses as it would not require any land acquisition or conversion of uses to transportation.

Consistency with Adopted Plans

Fixed HOV Lane Alternative. With respect to applicable plans and policies, the Fixed HOV Lane Alternative would be consistent with:

- The transportation objectives of the general plans of Sonoma County, Petaluma, Marin County, and Novato because it enhances the main intercity, regional travel corridor, and thus, better allows local arterials to serve intracity travel;
- The aesthetic objectives of the general plans of Sonoma County and Marin County, because the realignment and widening of the mainline freeway sought to minimize footprint impacts to open spaces resources, although the visual landscape in Segment B would be substantially altered by the conversion of the expressway to a freeway, as discussed in detail in Section 3.1.11;
- The Calthorpe Study and the Marin County Congestion Management Plan because it is a major improvement, involving interchanges, ramps, and HOV lanes, that is anticipated to ease congestion on US 101. Although the Calthorpe Study did not include upgrading Segment B to freeway status as part of the Preferred Scenario, it did not discount this alternative from being viable. The Study did note that, should state or federal funding become available to upgrade the segment to a freeway, the two counties "may wish to consider its implementation." Related improvements – new interchanges, new or revised on- and off-ramps, and modified shoulders – were considered essential to a future upgrade scenario;
- State transportation plans (i.e., the Route Concept Report and Transportation System Development Plan) because it offers congestion relief for US 101 and would help implement these plans;
- The Regional Transportation Plan (RTP) and the Clean Air Plan because it promotes efficient use of the existing freeway infrastructure, it enhances safety, it promotes HOV lanes that reduce regional air emissions, and it improves transit service.

Reversible HOV Lane Alternative. Even though the Reversible HOV Lane Alternative would provide an HOV lane in one direction, depending on the time of day, it would still offer congestion relief along the US 101 and help implement plans and programs that have called for improvements to this stretch of the corridor. As a result, this alternative would also be consistent with the applicable plans and policies, as described above for the Fixed HOV Lane Alternative.

Access Options. Whereas the Build Alternatives address interregional and intraregional travel and thus are important to countywide, regional, and state

plans, the Access Options concern much more localized travel. Accordingly, the most applicable plans are the Marin Countywide Plan and the Sonoma County General Plan. Applicable policies from these plans call for the protection of the rural character, scenic beauty, open spaces, and other natural resources. Each Access Option would vary in its impacts to these resources and, thus, their consistency with applicable policies. During the formulation of the Access Options, care was taken to minimize footprint impacts to natural resources to the extent feasible. The retention of the overall rural character of the area, as discussed above, suggests that each of the Access Options would generally be consistent with relevant county policies. For further details on the Access Options' effects on farmlands, visual resources, trees, and wetlands, please refer to the assessments in Sections 3.1.5, 3.1.11, 3.3.2, and 3.3.3, respectively.

No Build Alternative. In the future, the increasing congestion on US 101 that would occur without improvements could discourage future development/ expansion proposals, restrict local and regional mobility, and limit the counties' ability to foster city-centered development because of inadequate US 101 capacity and accessibility. Thus, the No Build Alternative would not support the adopted plans that call for congestion relief on US 101. In addition, the No Build Alternative would not satisfy Transportation Control Measure 8 of the Clean Air Plan, to construct carpool/express bus lanes on freeways.

Land Use Conversions

Fixed HOV Lane Alternative. The greatest amount of conversions would occur in Segment B. Land use changes in relation to property acquisitions would vary depending on the Access Option, as described below. Depending on the Access Option identified, the Fixed HOV Lane Alternative would convert between 145.77 ha (360.25 ac) and 170.59 ha (421.58 ac) of land to transportation use.

In Section A, 0.25 ha (0.63 ac) would be converted from commercial/office use. In Segment C, 1.94 ha (4.80 ac) would be converted from residential, commercial/office, agricultural, and vacant/other uses.

Commercial land conversions would take place along driveway areas, not commercial floor space or storage space. In these cases, access to commercial establishments would be restored. Agricultural land conversions are discussed in Section 3.1.5.

Reversible HOV Lane Alternative. Because the Reversible HOV Lane Alternative would have the same footprint and roadway improvements as the Fixed HOV Lane Alternative, the land conversion impacts described for the Fixed HOV Lane Alternative also apply to the Reversible HOV Lane Alternative. Thus, this Build Alternative would also convert between 145.77 ha (360.25 ac) and 170.59 ha (421.58 ac) of land to transportation use, depending on the Access Option identified.

Access Options. Depending on the Access Option identified, the amount of land converted to transportation use would vary, as shown in Table 3.1-2. Access Option 14d would require the most land conversion (168.40 ha [416.15 ac]) of the four options; while Access Option 12b would convert the least (143.58 ha [354.82 ac]). For all Access Options, the largest land use type impacted would be residential use; the smallest impact would be commercial/office uses.

Table 3.1-2 Land Use Converted to Transportation Under the Build Alternative by Segment and Access Option

Land Use Converted	Segment A	Access Option 4b	Access Option 12b	Access Option 14b	Access Option 14d	Segment C
Residential to Transportation	0.00 ha/ 0.00 ac	79.45 ha/ 196.31 ac	70.76 ha/ 174.86 ac	80.81 ha/ 199.69 ac	83.70 ha/ 206.84 ac	0.12 ha/ 0.28 ac
Commercial/ Office to Transportation	0.25 ha/ 0.63 ac	3.41 ha/ 8.43 ac	3.41 ha/ 8.43 ac	3.41 ha/ 8.43 ac	3.41 ha/ 8.43 ac	1.46 ha/ 3.64 ac
Agricultural to Transportation	0.00 ha/ 0.00 ac	65.67 ha/ 162.27 ac	63.22 ha/ 156.23 ac	63.61 ha/ 157.17 ac	73.52 ha/ 181.67 ac	0.17 ha/ 0.41 ac
Vacant/ Other to Transportation	0.00 ha/ 0.00 ac	6.19 ha/ 15.30 ac	6.19 ha/ 15.30 ac	6.19 ha/ 15.30 ac	7.77 ha/ 19.21 ac	0.19 ha/ 0.47 ac
Total Land Converted to Transportation	0.25 ha/ 0.63 ac	154.72 ha/ 382.31ac	143.58 ha/ 354.82 ac	154.02 ha/ 380.59 ac	168.40 ha/ 416.15 ac	1.94 ha/ 4.80 ac
ha = hectares ac = acres						

As reported in the discussion of Farmlands (Section 3.1.5), proposed right-of-way acquisitions would not cut off property owners from access to their lands. However, upgrading Segment B to an access-controlled freeway would sever the direct access that many property owners currently have to US 101 via private driveways. In these cases, property owners would access US 101 by way of access roads or interchanges proposed under the Access Options. Compensation for property owners who currently have direct access will be reached with individual property owners based upon impacts to their property under Access Option 12b, as this is part of the Preferred Alternative.

No Build Alternative. The No Build Alternative proposes routine maintenance and upkeep of the existing US 101 facility. Since no new improvements or expansion of the right-of-way is included as part of this alternative, the No Build Alternative would not result in land conversion or relocation impacts.

3.1.2.4 Avoidance, Minimization, and Mitigation Measures

The MSN Project is compatible with the existing land use pattern and supports future land use plans and policies. Therefore, no measures to avoid, minimize, or mitigate impacts are warranted. However, during project development, Caltrans will continue to look at ways of reducing the project footprint in order to minimize the conversion of additional farmland.

3.1.3 Parks and Recreation

3.1.3.1 Regulatory Setting

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at U.S.C. 303, declares that it is the policy of the United States government that special effort should be made to preserve the natural beauty of the countryside and public park and recreational lands, wildlife and waterfowl refuges, and historic sites, all of which are integral components of community character.

The Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

1. There is no prudent and feasible alternative to using that land; and
2. The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Special consideration is given to the temporary occupancy of 4(f) land. If the following five conditions can be satisfied, Section 4(f) will not apply:

1. Duration of occupancy must be temporary, i.e., less than the time needed of construction of the project, and there should be no change in ownership of the land;

2. Scope of work must be minor, i.e., both the nature and magnitude of the changes to the 4(f) resource must be minimal;

3. There are no anticipated permanent adverse physical impacts, nor will there be interference with the activities or purposes of the resource, on either a temporary or permanent basis;

4. The land being used must be fully restored, i.e., the resource must be returned to a condition which is at least as good as that which existed prior to the project; and

5. There must be documented agreement of the appropriate federal, state or local officials having jurisdiction of the resource regarding the above conditions.

3.1.3.2 Affected Environment

Olompali SHP and 55 other park and recreational facilities that are located in the project study area are listed in Table 3.1-3 and shown in Figure 3.1-3. These facilities are operated by the park and recreational departments of the cities of Novato and Petaluma, the Marin County Open Space District, and the State of California. The golf courses in the study area are operated privately. Numbers on the table are keyed to locations shown in the figure.

Managed by the California Department of Parks and Recreation (DPR), the 700-acre Olompali SHP has multiple uses including recreation, education, and preservation uses. Olompali SHP is considered a 4(f) resource under the Department of Transportation Act of 1966 (49 U.S.C. 303). The park is located in Segment B of the project corridor and is only directly accessible from the southbound side of the expressway. Caltrans' existing right-of-way extends up to the park entrance.

Currently there is only motorized access from southbound US 101. From the northbound direction, motorists can access southbound lanes at the open median at San Antonio Road approximately 2.5 miles north of Olompali SHP, or at the South Petaluma Boulevard Undercrossing, approximately 7 miles north of the Park. As stated in Section 1.2, nonstandard sight distances and congestion hamper

crossing the open median at San Antonio Road. Traveling to South Petaluma Boulevard Undercrossing poses a similar inconvenience to park visitors as it does to residents who live within the expressway segment in that they have to travel long distances to double back to access points on the opposite side of US 101. Safe bicycle crossings are also not available due to this limited access between the east and west sides of US 101.

The southbound on/off ramps to the Park are also shorter than standard, which require quicker deceleration and acceleration than standard ramps would allow. Bicycle access to the Park is available from San Antonio Road.

On the east side of US 101 across from Olompali SHP is a direct access road leading to the Mira Monte Marina, a local docking point to the Petaluma River. The Marina does not own the access road. Therefore, unlike Olompali, the project boundaries are not adjacent to the Marina. Consequently, Mira Monte Marina would not be used for the purposes of Section 4(f). Likewise, the other 54 public parks and recreational facilities listed in Table 3.1-3 and shown in Figure 3.1-3 are outside the MSN Project boundaries and, therefore, would not be considered for purposes of 4(f).

3.1.3.3 Impacts

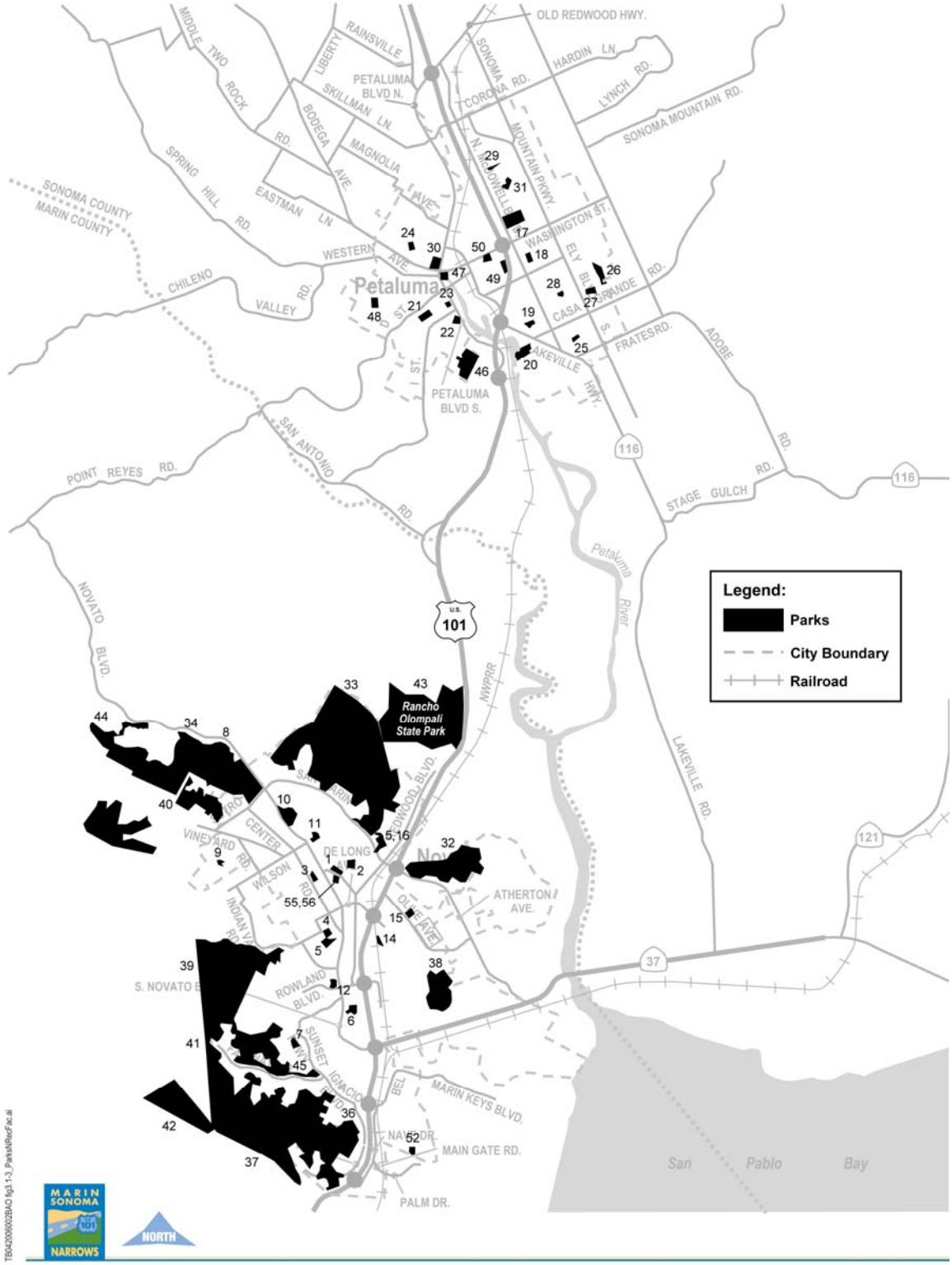
Fixed HOV Lane Alternative. Because Olompali SHP is a Section 4(f) resource under the Department of Transportation Act of 1966 (49 U.S.C. 33), Caltrans and FHWA have taken measures to avoid permanent impacts to the park. With this in mind, Caltrans would shift the US 101 mainline eastward up to 90 ft away from the park. This shift away from the park would allow the existing southbound lanes to be repaved and used as a Class 1 bicycle path from the Redwood Landfill Road Overcrossing to the park. In cooperation with the DPR, a new park entrance would be constructed to conform with the MSN Project. As further explained under Access Options, this alternative would meet the temporary occupancy conditions for 4(f) lands presented in Section 3.1.3.1.

The Fixed HOV Lane Alternative would not impact any other park facilities within the project area.

Table 3.1-3 Existing Park and Recreational Facilities in the MSN Study Area

No.	Name	No.	Name
Parks – City of Novato			
1	Marion Recreation Area	9	Marin Highlands Park
2	Lee Gerner Park	10	Miwok Park
3	Lu Sutton School Park	11	Pioneer Park
4	Hill Recreation Area	12	Scottsdale Pond
5	Arroyo Avichi Park	13	South Novato Boulevard Park
6	Lynwood School Park	14	Slade Park
7	Joseph Hoog Park	15	Olive School Park
8	Lions Park	16	Stafford Grove Park
Parks – City of Petaluma			
17	Lucchesi Park	25	Del Oro Park
18	McDowell Park	26	Wiseman Airport Park
19	Miwok Park	27	Arroyo Park
20	Shollenberger River Park	28	La Tercera Park
21	McNear Park	29	Sunrise Park
22	Wickersham Park	30	Putnam Plaza
23	Walnut Park	31	Bond Park
24	Oak Hill Park		
Preserves			
32	Rush Creek Open Space	38	Deer Island Open Space
33	Mount Burdell Open Space	39	Indian Valley Open Space
34	Little Mountain Open Space	40	Verissimo Hills Open Space
35	Indian Tree Open Space	41	Ignacio Valley Open Space
36	Loma Verde Open Space	42	Lucas Valley
37	Pacheco Valle		
State Parks			
43	Rancho Olompali SHP		
Golf Courses			
44	Indian Valley Golf Club	45	Marin Country Club
46	Petaluma Golf and Country Club		
Recreation Centers – City of Petaluma			
47	Cavanagh Landing	50	Swim Center and Skate Park
48	Cavanagh Recreation Center	51	Petaluma Community Center
49	Kenilworth Athletic Fields		
Recreation Centers – City of Novato			
52	Hamilton Community Center	55	Novato Gymnastics Center
53	Hamilton Pool/Camban	56	Novato Teen Center
54	Hill Community Room and Gym		
Source: Parsons 2005			

Figure 3.1-3 Parks and Recreational Facilities in the MSN Study Area



Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would propose the same footprint and freeway improvements and modifications as the Fixed HOV Lane Alternative. The one difference between the two Build Alternatives is the operation of the HOV lane in the median, and this feature would not alter the description of impacts to parks and recreational facilities under the Fixed HOV Lane Alternative. As further explained under Access Options, the Reversible HOV Lane Alternative would meet the temporary occupancy conditions for 4(f) lands presented in Section 3.1.3.1

Access Options. Any of the Access Options would work with either of the Build Alternatives. Furthermore, the improvements to the Park entrance and right-of-way transfers that include the Class 1 bicycle/pedestrian facility would be the same under each Access Option due to the eastward alignment of the US 101 mainline, the closure of the existing southbound exit, and new motorized access along Redwood Boulevard. A new entryway will require approximately 0.32 ha (0.78 ac) of temporary Park right-of-way during construction. The scope of work would also involve relocating the park sign to coincide with the new park entrance. The existing US 101 southbound lanes would be repaved and converted to a Class 1 bike/pedestrian facility. In addition, the State DPR has requested that Caltrans relinquish a portion of Redwood Blvd. leading up to Olompali's entrance. Consequently, Caltrans and FHWA would agree to transfer approximately 6.11 ha (15.1 ac) to the DPR including the Class 1 bicycle/ pedestrian path along the southerly approach from the Redwood landfill overcrossing and the northerly approach from Redwood Boulevard (see letter to DPR and meeting notes dated 6/30/08, Appendix C).

The MSN Project is eligible for special consideration for temporary occupancy of 4(f) land. Under the Build Alternatives, Caltrans and the FHWA have satisfied the five conditions for temporary occupancy of 4(f) land stated in Section 3.1.3.1. This is demonstrated in the following discussion:

The duration of project construction involving Olompali SHP would be approximately three months, compared to the construction of the MSN Project, which would be phased over several years. Therefore, the duration of occupancy would be temporary, and certainly shorter than the construction of the entire project. While Caltrans would transfer right-of-way to the Department of Parks and Recreation, there would be no change in ownership of parkland to Caltrans or the FHWA.

The scope of work involving the parkland would be minor and beneficial based upon construction of a new entrance connecting to a new Class 1 bicycle/pedestrian lane from the Redwood Landfill Overcrossing north of the Park. A Class 2 bicycle path would also be accessible along Redwood Boulevard. Motorized access from Redwood Boulevard via Atherton Interchange, approximately 2 miles south of the Park, would be an improvement over the existing nonstandard southbound ramps. The Atherton Interchange would serve both northbound and southbound motorists.

Public access to the Park would be maintained during construction, and signage and routing would be developed in conjunction with Park officials.

There would be no permanent adverse impacts to Olompali SHP resources or its amenities, such as its historic resources, recreational or bicycle trails, historic gardens, or parking facilities.

The Parkland involved in the construction of the MSN Project would be restored to comparable or better condition than prior to construction due to the new entrance and connections, improving access for Park visitors, as described above. The transfer of right of way from Caltrans to DPR would allow for improved security and park operations (see letter and meeting notes 6/30/08, Appendix C).

Documented agreement that the above conditions were met was made between the DPR and Caltrans on September 15, 2008 (see letter dated 9/11/08, and signed by DPR 9/15/08, Appendix C).

In terms of other recreational facilities adjacent to the MSN Project, on the east side of US 101, across from Olompali SHP, there is a local road providing access to the Mira Monte Marina on San Pablo Bay. The eastward realignment of US 101 in this area would eliminate the current at-grade connection to Mira Monte Marina. Under the Preferred Alternative, Access Option 12b will provide convenient replacement access, with both northbound and southbound traffic able to use the Redwood Landfill Road Interchange, north of the marina, to reach a new frontage road serving the marina along the eastside of US 101. Replacement access would also be provided for Access Options 14b and 14d, but travelers would need to use the San Antonio Overcrossing further north to reach the new frontage road. This connection would not be as convenient as Access Option 12b. Access to the marina under Access Option 4b would be the same as 12b.

No Build Alternative. Since the No Build Alternative would involve only routine maintenance and upkeep of US 101, there would be only limited impacts to any park or recreational facilities during the short-term, temporary construction period.

3.1.3.4 Avoidance, Minimization, Mitigation Measures

During the early stages of the project, Caltrans and FHWA developed plans for a new entryway to be built within the existing park right-of-way, which would have resulted in a minor incorporation of parkland. However, to avoid permanent impacts to the park, the entryway was shifted southward along Redwood Blvd. Thus, use of 4(f) land has been avoided.

Public access to the Park would be maintained during construction, and Caltrans shall plan construction activities and staging with state park officials to ensure public access and park operations are not disrupted. Signage and routing would also be developed in conjunction with Park officials. These measures along with Highway Advisories, Public Information, ITS, and other traffic management measure will reduce impacts to park attendance during construction.

3.1.4 Growth

Introduction

This growth assessment examines the relationship of the MSN Project to economic and population growth and the construction of additional housing in northern Marin County and southern Sonoma County. It focuses on the potential for the project to facilitate or accelerate growth beyond planned developments, or induce growth to shift from elsewhere in the region. In this analysis, the project's influence on area growth due to travel time savings is considered within the context of other relevant factors such as relative cost and availability of housing, availability of amenities, local and regional growth policies, and development constraints. The information presented in this section is taken from the technical report, Growth Inducement Analysis for Marin-Sonoma Narrows from Ignacio Boulevard, Novato to Old Redwood Highway, Petaluma (Parsons 2005) and Caltrans Environmental Handbook, Volume 4, Community Impact Assessment (June 1997).

Caltrans conducted a growth study for the MSN Project to address two main issues. The first issue is whether the improved or enhanced accessibility provided by either Build Alternative would increase residential growth beyond what is

planned in northern Marin County or southern Sonoma County, or would merely support planned growth. The second issue is the sensitivity of environmental resources to unplanned growth, particularly agricultural lands. The study addressed these issues by analyzing population, employment, housing, work trips, and local growth plans in northern Marin and southern Sonoma cities and counties. Then, travel time savings information from the Traffic Operations Study (Caltrans, February 2005) was used to analyze how travel times would affect the aforementioned trends. In addition, the Caltrans analysis addressed whether the project would reduce or remove barriers to growth by looking at current zoning designations in affected cities and counties.

3.1.4.1 Regulatory Setting

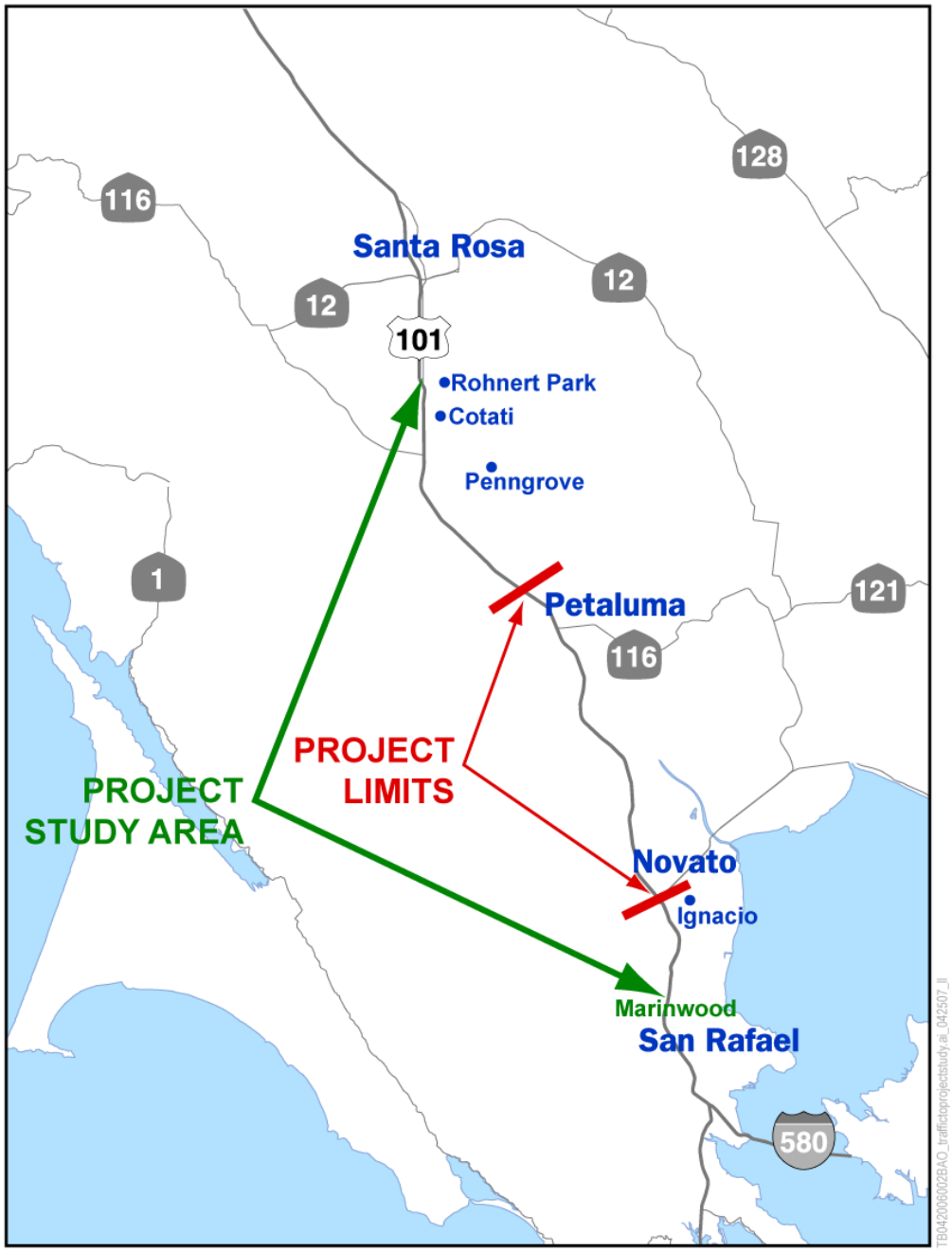
The Council on Environmental Quality (CEQ) regulations, which implements the National Environmental Policy Act (NEPA) of 1969, requires evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations, 40 CFR 1508.8, refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. CEQA guidelines, Section 15126.2(d), require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

3.1.4.2 Affected Environment

Three northern Marin County and three Sonoma County areas were selected for a regional analysis of current population trends: Miller Creek, Hamilton Field, San Antonio (where Marin borders Sonoma County), Petaluma, Penngrove, and Rohnert Park. Land uses are discussed in Section 3.1.1 and shown in Figure 3.1-1. The Growth Study Area is shown in Figure 3.1-4. While the population of Sonoma County is expected to increase 28 percent between 2000 and 2030, Rohnert Park, Petaluma, and Penngrove would represent 18 percent of Sonoma

Figure 3.1-4 Relationship of Growth Study Area to Project Area



County's expected growth. The selected Marin County communities will comprise 6 percent of the County's population but 38 percent of the County's growth (144 percent) between 2000 and 2030.

According to Census 2000 Journey to Work tables, the majority of commute trips for both Marin County and Sonoma County are within their respective counties. Commuters from Marin County who work outside the County work primarily in San Francisco/Peninsula (28 percent) and the East Bay (6 percent). In addition to the 8 percent of Sonoma County commuters who work in Marin County, about 8 percent of the Sonoma County commuters pass through Marin County on their way to other counties, resulting in about 16 percent of Sonoma County commuters passing through at least part of the Project area. Thus, the Sonoma County residents commuting to Marin County or farther south constitute the predominant current use of US 101 through the MSN Project area for commuting.

Commuter traffic contributes to vehicle volumes exceeding capacity, resulting in severe congestion and increased travel times along US 101 through the project area, mostly during peak hours. The heavy traffic and delays on US 101 also lead to traffic spill-over onto local streets, which affects the quality of life in communities along the highway. These traffic issues would tend to constrain development and growth, particularly for the more remote areas in the northern portion of Marin County.

The existing at-grade intersections and rural, agricultural land uses in Segment B help to maintain barriers to growth. Additionally, there are no traffic-dependent establishments in Segment B, except the Gas `N' Shop on Kastania Road.

3.1.4.3 Impacts

Growth Inducement

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would improve traffic conditions and travel times through the project area and vicinity. The growth-inducing effect of the MSN Project on development in residential growth areas throughout the US 101 corridor was evaluated in the Growth Inducement Analysis technical report. Growth could be affected by reduced travel time (enhanced accessibility) and local and regional growth policies, growth constraints, the relative costs and availability of housing, and amenities available in the selected residential areas.

Based on the traffic and transportation analysis (Section 3.1.10), average travel time savings[1] would vary from less than one minute to about nine minutes for trips between the six residential zones and eight employment zones, with the residential areas towards the north end of the study area having the most travel time savings under the Fixed HOV Lane Alternative. This travel time savings would slightly increase growth pressure in Petaluma.

The Fixed HOV Lane Alternative would eliminate delay in HOV lanes, allowing the HOV lane users to travel at or very near free-flow speeds through the project area. However, the mixed-flow lanes within the project boundaries would not be operating at free-flow speed during peak hours. The mixed-flow lane users would still experience congestion and delay. Therefore, growth would not be induced entirely by the HOV free-flow speeds. Hence, while the Fixed HOV Lane Alternative would support some of the planned growth in the area, it would not fully accommodate planned growth or induce unplanned growth.

While travel time savings from the Fixed HOV Lane Alternative could theoretically stimulate growth modestly, other factors in addition to traffic conditions influence growth. For example, local plans and policies that control local land use and undevelopable lands within their jurisdictions create the context within which the Fixed HOV Lane Alternative is being proposed and, as such, are a greater influence on growth control than travel time saving alone would provide. Each of the six study communities has adopted plans and mechanisms to control the amount and type of growth within their jurisdiction. For example, the City of Petaluma has defined an “urban limit line” to mark the outer edge of where urban development can occur during its planning period. Petaluma also uses a “residential development control system,” to limit growth to a specified number of units per year. In Marin County, more than three-fourths of the County’s land is protected from development. One of the goals of the Marin County General Plan is to concentrate urban growth in its selected city-centered corridors.

Other primary factors, in addition to commute time and growth plans, that affect population growth in outlying residential communities include the cost and availability of housing. Housing prices in Marin and Sonoma Counties are high, compared to many other residential areas in the San Francisco Bay Area. Prices have increased dramatically in both counties and prices can be expected to

[1] Average travel time for both HOV lane and mixed-flow lane users.

continue increasing as more people move to the North Bay. In addition, the housing vacancy rate for the four areas that could be affected by the MSN Project varies between 1.0 and 1.5 percent, which indicates that the demand for housing in these residential areas is much higher than the available housing supply. Low housing vacancy rates and high housing costs tend to act as growth deterrents that would outweigh minor travel time savings.

In conclusion, growth management policies, as well as moderately high housing prices and low vacancy rates, would tend to discourage accelerated residential growth, even in areas where commuters would realize the greatest potential travel time savings. Therefore, the Fixed HOV Lane Alternative would support planned growth, but would not induce unplanned growth in the area. Because the Fixed HOV Lane Alternative would not induce unplanned growth, it would not cause secondary impacts to environmental resources.

Reversible HOV Lane Alternative. Travel time savings under the Reversible HOV Lane Alternative would be the same as that under the Fixed HOV Lanes Alternative for all residential zones except Hamilton Field and Miller Creek. Since the Reversible HOV Lane Alternative would not improve effective capacity in the “reverse” commute direction (northbound in the morning and southbound in the evening), there would be no travel time savings for traffic from these two residential areas. In addition, there would be no travel savings from any of the residential zones to the jobs in central Sonoma County, since these trips would be in the reverse commute direction as well. Based on these travel time savings, the growth inducement analysis showed a slight increase in growth pressure in Petaluma.

However, as described above for the Fixed HOV Lane Alternative, the other factors influencing growth in the project area would prevent the Reversible HOV Lane Alternative from inducing growth. These factors include the growth management policies of the affected communities and the availability and cost of housing. Therefore, the Reversible HOV Lane Alternative would not induce growth and would not cause secondary effects to environmental resources.

Access Options. Addressing at-grade access issues within Segment B the Central Segment, is an important part of the project’s Need and Purpose. All of the Access Options propose the construction of new interchange(s) and access roads. These features are usually considered to be growth inducing. However, the

purpose of new interchanges in the MSN Project would be to replace the direct access to US 101 that presently exists within Segment B. This segment is approximately 13.1 km (8.1 mi) long.

In addition, Marin County and Sonoma County land use policies support the preservation of the existing agricultural communities. To coincide with these policies, each of the four Access Options under evaluation would use major portions of the existing local roads. The roads would also be non-continuous, rather than bypasses to the mainline, or attractions to traffic dependent establishments or new residential development. The access roads themselves would then be transferred to county ownership, which are, again, governed by local land use plans and policies.

Based upon these limits to the access roads along with the agricultural and open space land uses supported by the counties' general plans, the proposed Access Options would not be growth inducing.

No Build Alternative. The No Build Alternative would not improve access to or along the US 101 corridor, and therefore the No Build Alternative does not have the potential to attract additional land development or intensification. Accordingly, the No Build Alternative would have no effect on growth.

3.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans' Alternatives analysis included criteria for evaluating compatibility with current land use and zoning. From this standpoint, various alternatives were eliminated that had less compatibility than the four access options that were identified for further study under the Build Alternatives. Therefore, various alternatives that had stronger growth inducing potential were eliminated during Caltrans alternatives analysis (Appendix A). For the Build Alternatives, This Access Option requires the least amount of land conversion (Table 3.1-2). Caltrans is proposing non-continuous access roads to serve the existing low-density, rural land uses in Segment B of the project. As stated in Section 3.1.2, the Preferred Alternative will require land use conversions; however, those will not alter the predominantly rural character of Segment B. The local road network in Segment B will be based on Access Option 12b under the Preferred Alternative. Based upon this design and the results of the Growth Study, no additional avoidance, minimization and mitigation measures are recommended.

3.1.5 Farmlands/Agricultural Lands

3.1.5.1 Regulatory Setting

NEPA and the Farmland Protection Policy Act (FPPA, 7 USC 4201-4209; and its regulations, 7 CFR Part 658) require federal agencies, such as FHWA, to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and lands of statewide or local importance.

CEQA requires the review of projects that would convert existing farmlands, as well as Williamson Act contract lands, to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property tax assessments to deter the early conversion of agricultural and open space lands to other uses.

Local policies contained in the general plans of communities in the MSN Project area further describe the importance of protecting farmlands and agricultural activities.

Marin Countywide Plan. The primary objectives of the Agriculture Element of the Marin Countywide Plan are to preserve agricultural lands and prevent subdivision of lands under agricultural production. The County's agricultural policies recognize the value of continued agriculture for regional food and fiber and also as an industry for the diversified county economy. Most of the County's agricultural lands are in the western portion of the County, although the area north of Novato to the county line, including the MSN Project area, is also in agricultural or rural uses, as shown earlier in Figure 3.1-1.

Sonoma County General Plan. The main agricultural goal for Sonoma County is to promote a healthy and competitive agricultural industry whose products are recognized as being produced in Sonoma County. Agricultural lands are predominantly in unincorporated areas of Sonoma County, including the area from the southern county line to Petaluma, which encompasses the MSN Project area.

City of Novato General Plan. The primary agricultural goal of the City of Novato General Plan is to encourage continued agricultural use by maintaining parcel sizes large enough to sustain agricultural production; preventing conversion of agricultural land to non-agricultural uses; discouraging uses that are incompatible with agricultural activities; implementing programs that assist agricultural operators and owners to maintain and improve agricultural productivity of their land; and assisting local marketing of locally-produced agricultural products. Most of the agricultural land in the Novato area is outside the city limits, although some agricultural activity still takes place inside Novato.

City of Petaluma General Plan, 1987-2005. Petaluma's primary agricultural goal is to preserve and protect agricultural use on lands surrounding the City of Petaluma. Almost all the remaining agricultural land in the City of Petaluma is located in the northwest region of the city adjacent to Sonoma County farmlands.

3.1.5.2 Affected Environment

Along US 101 in the expressway portion of the project corridor between the San Marin Drive/Atherton Avenue Interchange and San Antonio Road, land uses are primarily agricultural and open space. Agricultural land uses are shown in Figure 3.1-1.

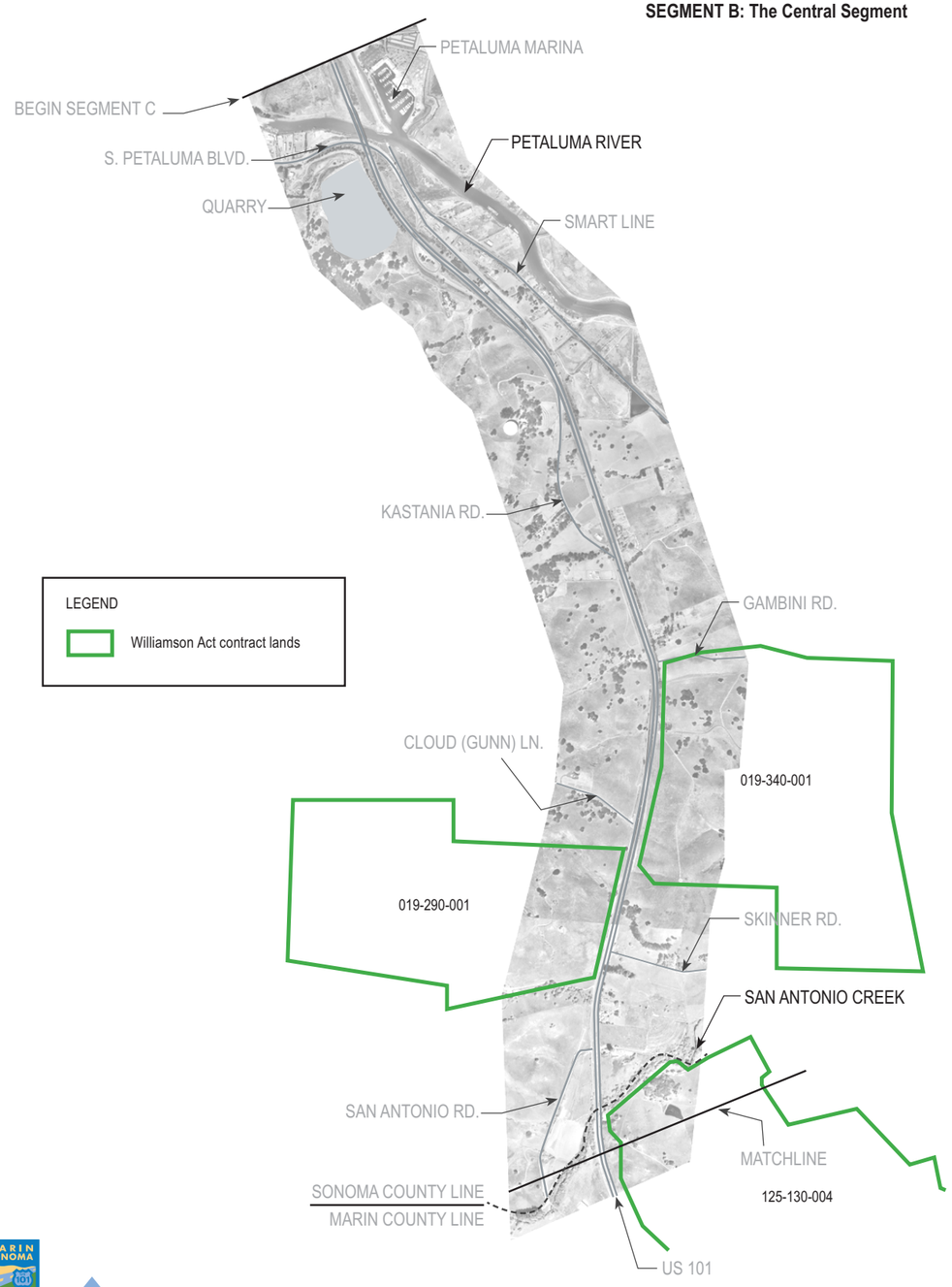
While the MSN Project area is agricultural in nature, there is relatively little land in the corridor that is designated prime farmland, unique farmland, or lands of statewide or local importance, according to the NRCS definitions. Much of the project corridor is classified as grazing.

With respect to Williamson Act lands, there are six parcels dispersed on either side of the San Antonio Creek that are under Williamson Act contracts along US 101, as shown in Figures 3.1-5a and b, two in Sonoma County and four in Marin County.

3.1.5.3 Impacts

Fixed HOV Lane Alternative. The amount of farmland affected in Marin County and Sonoma County is summarized in Table 3.1-4. Farmland that would be affected by the Fixed HOV Lane Alternative occurs almost entirely within Segment B of the project boundaries; therefore, the ultimate amount of farmland affected would depend upon the Access Option identified. Small amounts of farmland in Segment C would also be impacted, although none of this land is

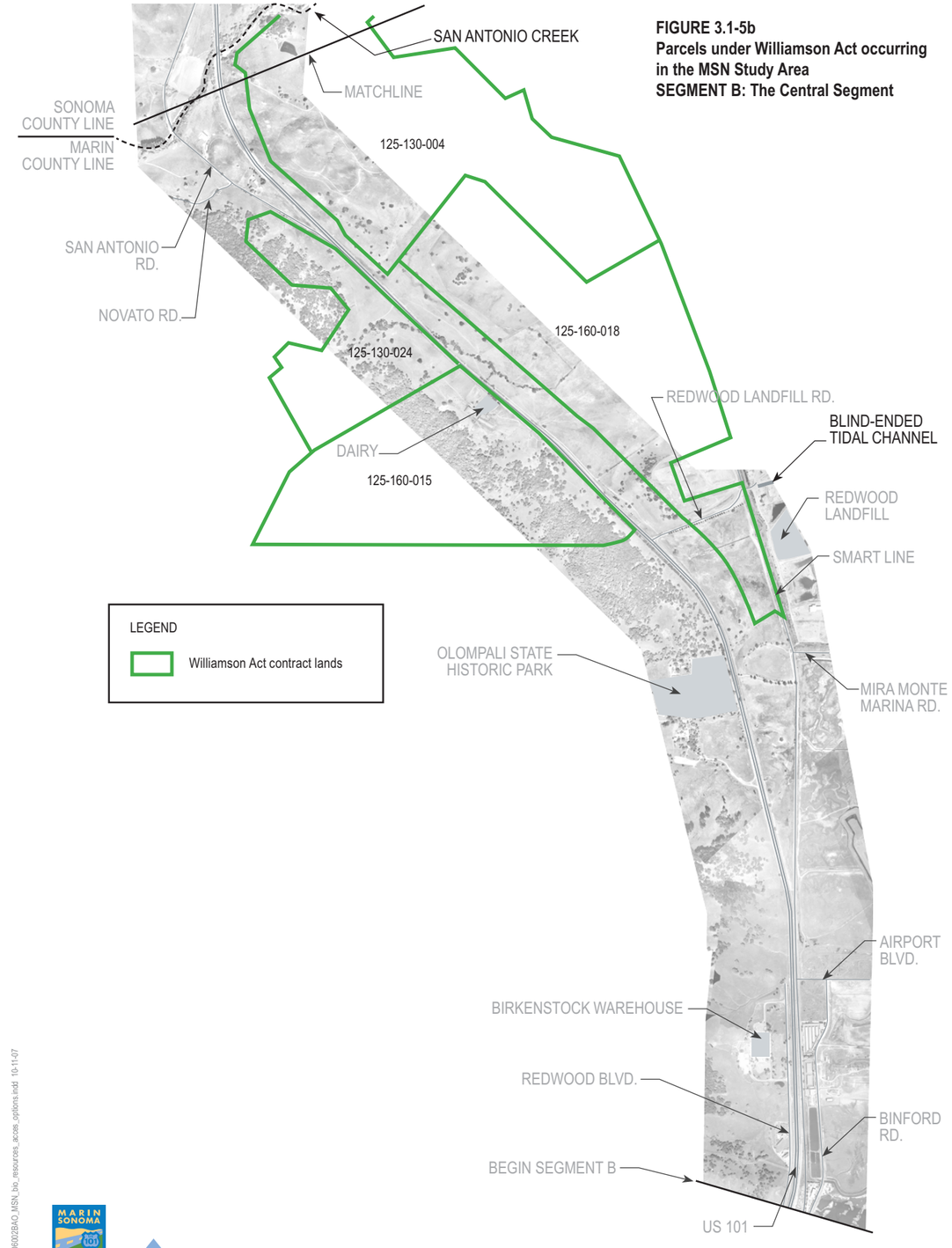
FIGURE 3.1-5a
Parcels under Williamson Act occurring in the MSN Study Area
SEGMENT B: The Central Segment



Note: Not to Scale

TB042006002BAO_MSN_bio_resources_acces_options.indd 10-11-07

FIGURE 3.1-5b
Parcels under Williamson Act occurring in the MSN Study Area
SEGMENT B: The Central Segment



Note: Not to Scale

TB042006002BAO_MSN_bio_resources_acces_options.indd 10-11-07

considered prime agricultural, of statewide importance, or under Williamson Act contract.

Under the Fixed HOV Lane Alternative, the amount of farmland that would be affected varies by Access Option because of the variations in interchange locations and frontage roads proposed under the different options (Table 3.1-4). These differences are further discussed under Access Options below. In total, the Fixed HOV Lane Alternative would convert between approximately 63.39 ha (156.64 ac) and 73.69 ha (182.09 ac) of farmland in Marin and Sonoma Counties to transportation use.

The proposed right-of-way acquisition associated with the Fixed HOV Lane Alternative would not bisect any parcels or sever existing owners from accessing their properties.

Project-related construction would not interfere with the operations or functions of agricultural land uses.

Reversible HOV Lane Alternative. Since the project footprints for the Build Alternatives are the same, their effects on farmlands would be the same. Thus, the Reversible HOV Lane Alternative would also convert between approximately 63.39 ha (156.64 ac) and 73.69 ha (182.09 ac) of farmland in Marin and Sonoma Counties to transportation use, depending on the Access Option identified.

Access Options. Farmland impacts by Access Option are presented in Table 3.1-4. In terms of total farmland area affected, Access Option 12b would have the least effect across the two counties (63.22 ha, or 156.23 ac); Access Option 14d would have the greatest effect (73.52 ha, or 181.67 ac). By county, farmland in Marin County would be least affected by Access Option 12b and most affected by Access Option 14d. Farmland impacts in Sonoma County would be similar for all the Access Options.

Table 3.1-4 Farmland Impacts by Access Option in Segment B

County	Access Option 4b (ha/ac)	Access Option 12b (ha/ac)	Access Option 14b (ha/ac)	Access Option 14d (ha/ac)
Marin	33.29 (82.27)	30.46 (75.27)	31.33 (77.42)	41.24 (101.91)
Williamson Act Contract Lands	6.40 (15.81)	5.46 (13.50)	10.86 (26.82)	13.50 (33.36)
Sonoma	32.38 (80.00)	32.76 (80.96)	32.27 (79.75)	32.28 (79.77)
Williams Act Contract Lands	2.68 (6.62)	3.07 (7.59)	2.68 (6.62)	2.68 (6.62)
Marin and Sonoma	65.67 (162.27)	63.22 (156.23)	63.61 (157.17)	73.52 (181.67)
Williamson Act Contract Lands	9.08 (22.43)	8.53 (21.09)	13.54 (33.45)	16.18 (39.98)
Prime and Unique*	0.77 (1.9)	0.77 (1.9)	0.61 (1.5)	0.61 (1.5)
Statewide or Locally Important*	0.93 (2.3)	0.93 (2.3)	0.73 (1.8)	0.73 (1.8)

Source: Parsons Corporation, March 2006. County of Marin, Countywide Plan Map Viewer website (http://gisprod1.co.marin.ca.us/CWP/Viewer/bottom/Viewer.asp). Sonoma County Tax Assessor's Office, March 2006.
*Source: Natural Resources Conservation District.

Of total agricultural land converted to transportation use, between 8.53 ha (21.09 ac) and 16.18 ha (39.98 ac) would be converted from Williamson Act use, affecting four parcels in Marin County and two parcels in Sonoma County. In a letter dated April 5, 2007, Caltrans notified the California Department of Conservation (CDC) about the potential conversion of the Williamson Act contract lands in accordance with Government Code Section 51291(b). This coordination will be completed prior to preparation of the final environmental document. Appendix C contains a response letter from CDC dated May 7, 2007.

In accordance with provisions of the Williamson Act regarding retiring enrolled lands for state-approved public improvements, the following findings must be made. The location of the public improvement is not based primarily on a consideration of the lower cost of acquiring land in an agricultural preserve; the location for the project is based upon the need to reduce congestion through the 16-mile project limits. Also, locations for the public improvement are geographically limited. Shifting the mainline alignment westward would not be practical due to hilly/mountainous terrain, and shifting the project to the east would be limited by the Petaluma River and likely increase impacts to farmlands. Therefore, there is no other land within or outside the preserve on which it is reasonably feasible to locate the public improvement.

Caltrans will adhere to the acquisition process, policies and procedures described in the Caltrans Right of Way Manual, including Exhibit 8-EX-l, Article 6,

Acquisition Policies, to meet the intent of voiding the Williamson Act (§51295) contracts.

In addition to the Williamson Act land conversions, Table 3.1-4 identifies other important farmlands that would be affected by the Access Options. Access Options 4b and 12b would have identical impacts; Access Options 14b and 14d would affect less important farmlands. As required by Federal Regulations, a form to assess conversion of prime, unique, statewide, or locally important farmlands has been prepared. The rating form indicates that the total site assessment criteria score for the project ranges from 131 to 132, depending upon the Access Option identified (4b=131, 12b=131, 14b=132, 14d=132). According to federal regulations, scores less than 160 points should be given minimal consideration for protection (7 CFR 658.4). A copy of the Farmland Conversion Impact Rating Form along with the Site Assessment Criteria and Point Rating are in Appendix F.

Notably, the proposed farmland conversions would not bisect any parcels or sever existing owners from accessing their properties. Project-related construction would not interfere with the operations or functions of agricultural land uses. However upgrading Segment B to an access-controlled freeway would sever the direct access to US 101 that many property owners currently have via private driveways. In these cases, property owners would reestablish access to US 101 by way of access roads or interchanges proposed under the Access Options. Compensation for property owners who currently have direct access will be determined by Caltrans' Division of Right of Way (see Appendix E for summary of rights and benefits under the Uniform Assistance Programs).

No Build Alternative. Under the No Build Alternative, no right-of-way would be acquired within the study area; therefore, no farmland would be affected.

3.1.5.4 Avoidance, Minimization, and Mitigation Measures

During the alternatives development process, Caltrans minimized right-of-way impacts in Segment B of the project where agricultural land uses predominate. Throughout the design phase, Caltrans will continue reducing right-of-way impacts, where feasible.

Relocation Assistance. Where farmland impacts cannot be avoided and farmlands need to be acquired, Caltrans would comply with the Uniform

Relocation Assistance and Real Property Acquisition Policies Act summarized in Appendix E. Similarly, compensation for loss of direct access to US 101 for property owners who currently have direct-access rights would be determined after identification of a Preferred Alternative and project approval.

3.1.6 Community Character and Cohesion

This section discusses socioeconomics and community facilities within the MSN Project area. Also discussed are relocations under the Build Alternatives. Potential community impacts related to visual quality/aesthetics are discussed in Section 3.1.11.

3.1.6.1 Regulatory Setting

General

NEPA established that the federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [42 U.S.C. 4331(b)(2)]. FHWA in its implementation of NEPA [23 U.S.C. 109(h)] directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion and the availability of public facilities and services.

Under CEQA, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. In addition, the State CEQA Guidelines suggest that an important land use consideration is whether a proposed project might physically divide an established community or displace a substantial number of housing/people. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Relocation Assistance Program

The Department's Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of RAP is to ensure that persons displaced as a result of a transportation

project are treated fairly, consistently, and equitable so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. Please see Appendix E for a summary of the RAP.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.). Please see Appendix I for a copy of the Department's Title VI Policy Statement.

3.1.6.2 Affected Environment

Socioeconomics

A socioeconomic profile of the study area communities can be gained by reviewing background land use plans, growth policies, and demographic statistics, which are available in greater detail in Sections 3.1.2, 3.1.4, and 3.1.7, respectively.

Caltrans existing right-of-way in the project area includes the roadway, shoulders, medians, and existing structures, such as bridges, overcrossings, interchanges, and ramps. Generally, there are no demarcations for fencing delineating existing Caltrans right-of-way from adjacent land uses. As shown in Figure 3.1.1, Existing Land Uses, land uses adjacent to US 101 include commercial, agricultural, recreational, and residential.

Major land uses in Segment A that contribute to community character and cohesion include the College of Marin-Indian Valley, Stonetree Golf Club, Vintage Oaks Shopping Center, Novato Community Hospital, Valley Memorial Park, and Marin County Airport/Gnoss Field.

Segment B is defined by a number of large agricultural and institutional land uses that depend largely on the rural, scenic, and natural resources in this stretch. Key businesses and uses in Segment B include Birkenstock®, Buck Institute, Mira Monte Marina, Silveira Dairy, Equine Veterinarian Hospital, and Olompali SHP.

In Segment C, community cohesion is defined by the many residential neighborhoods the US 101 traverses, along with their related commercial and social institutions. Larger community-wide uses that help define the communities in this segment include the Petaluma Golf and Country Club, Adobe Creek Golf

Course, Petaluma Municipal Airport, Rooster Run Golf Club, Petaluma Valley Hospital, and the Santa Rosa Junior College Petaluma Campus.

The three segments are socioeconomically different, with Segment A relating to and similar to the City of Novato; Segment B, to the rural and agricultural community that straddles the county lines; and Segment C, to the City of Petaluma. The approximately 53,700 persons living in the census tracts that comprise the study area exhibit an ethnic composition comparable to the individual communities defining the study area, with about 20 to 25 percent ethnic minorities; the study area has a slightly higher percentage of minorities, attributable to a larger number of Hispanics. Median household income in the study area of about $63,800 is at the median between Marin County and Sonoma County, and very similar to the median household incomes for Novato and Petaluma.

Employment in Marin County is expected to increase more rapidly than population, with a 29 percent increase in jobs anticipated between 2000 and 2030. Employment in the City of Novato is projected to increase by 60 percent during the same period. Sonoma County and the City of Petaluma also are projected to experience rapid employment growth, with a respective 48 and 39 percent increase in jobs anticipated between 2000 and 2030.

These employment increases may indicate an improvement in the jobs/housing balance within Marin and Sonoma Counties as a whole, but projections emphasize continued demand for travel along US 101 with more people in-commuting to jobs within Marin and Sonoma Counties. US 101 is expected to continue being the primary north-south route to local and regional employment and commercial opportunities.

Public and Cultural Facilities

Public services and cultural facilities located in the study area, such as schools, libraries, museums and other community cultural facilities are listed in Table 3.1-5 and shown in Figure 3.1-6. Emergency service providers are also listed, and these are discussed under Section 3.1.8, Utilities/Emergency Services.

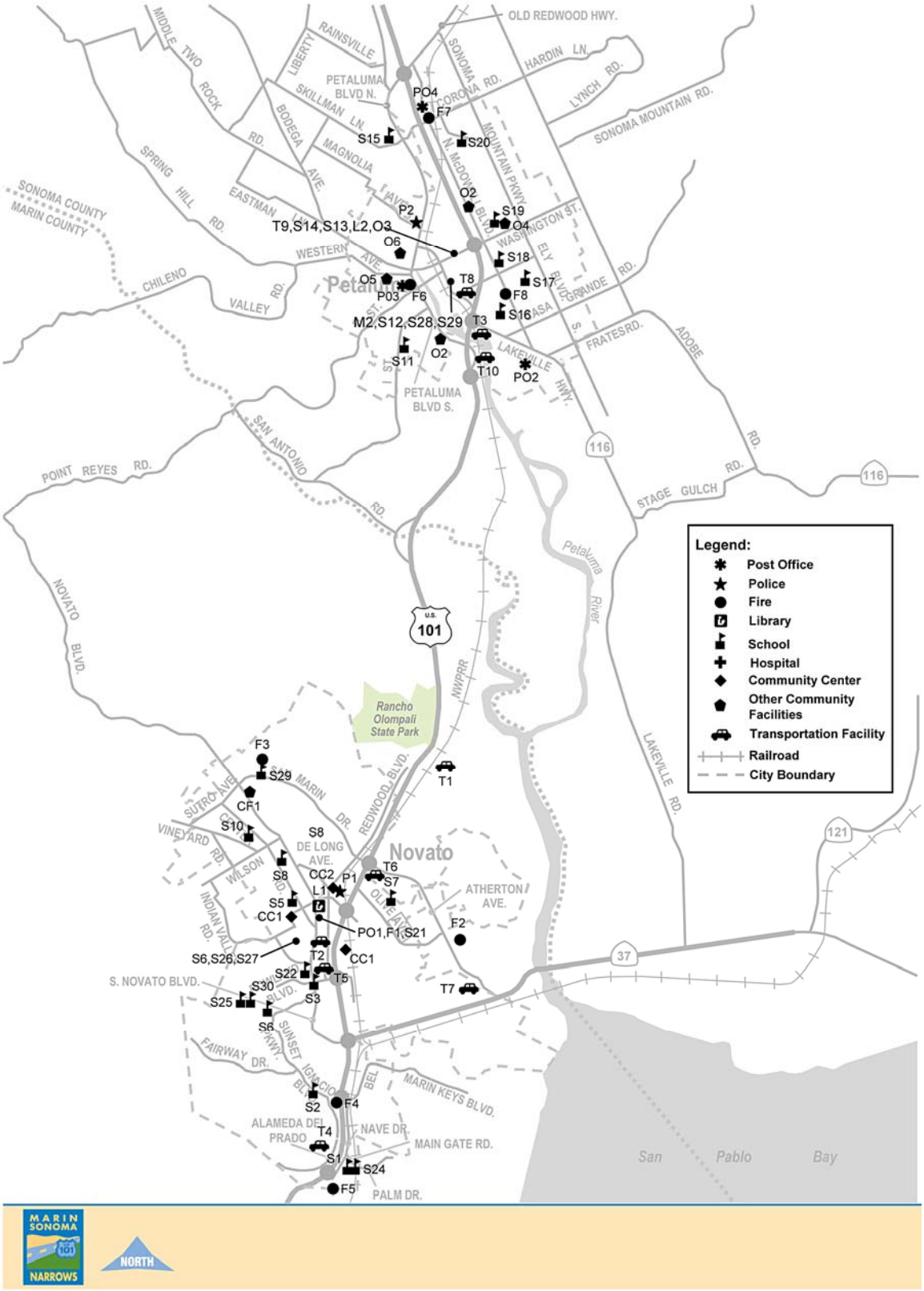
Houses of worship and cemeteries, though not discussed here, have the same land use distribution in the study area as that of public and cultural services, in that the availability of these facilities is concentrated within the urban centers of Novato and Petaluma, and absent in the expressway portion of the study area.

Table 3.1-5 Existing Public and Cultural Facilities in the MSN Study Area

No.	City	Name	No.	City	Name
Schools					
Elementary/Middle Schools – Public					
S1	Nov	Hamilton Elementary	S11	Pet	Grant Elementary
S2	Nov	Loma Verde Elementary	S12	Pet	Valley Oaks Alternative Elementary
S3	Nov	Lynwood Elementary	S13	Pet	Kenilworth Junior High
S4	Nov	Rancho Elementary	S14	Pet	McKinley Elementary
S5	Nov	Hill Middle	S15	Pet	Cinnabar Elementary
S6	Nov	San Jose Middle	S16	Pet	Miwok Valley Elementary
S7	Nov	Olive Elementary	S17	Pet	La Tercera Elementary
S8	Nov	Lu Sutton Elementary	S18	Pet	McDowell Elementary
S9	Nov	San Ramon Elementary	S19	Pet	Bernard Eldredge Elementary
S10	Nov	Sinaloa Middle	S20	Pet	Meadow Elementary
Elementary/Middle Schools – Private			High Schools – Public		
S21	Nov	North Bay Christian Academy	S26	Nov	Novato
S22	Nov	Christian Life School	S27	Nov	Marin Oaks High School
S23	Pet	Our Lady - Loretto Elementary	S28	Pet	San Antonio Continuation
Charter Schools			S29	Pet	Valley Oaks Alternative
S24	Nov	Novato Charter School	College/University		
Other School			S30	Nov	College of Marin
S25	Nov	Marin School of Arts and Technology			
Emergency Services					
Fire Stations			Hospital		
F1	Nov	Novato Fire Station #1	H1	Nov	Novato Community
F2	Nov	Novato Fire Station #2	H2	Pet	Petaluma Valley
F3	Nov	Novato Fire Station #3	Police Stations		
F4	Nov	Novato Fire Station #4	P1	Nov	Novato Police Station
F5	Nov	Novato Fire Station #5	P2	Pet	Petaluma Police Station
F6	Pet	Petaluma Fire Station #1	Military Services		
F7	Pet	Petaluma Fire Station #2	M1	Nov	U.S. Coast Guard
F8	Pet	Petaluma Fire Station #3	M2	Pet	National Guard Armory
Other Community Facilities					
Cultural Facilities			Community Centers		
CF1	Nov	Marin Museum of the American Indian	CC1	Nov	Margaret Todd Senior Center
CF2	Nov	Novato History Museum	CC2	Nov	Community House
CF3	Pet	Oldest House North of the San Francisco Bay	Libraries		
Post Offices			L1	Nov	Novato Library
PO1	Nov	Post Office	L2	Pet	Petaluma Regional Library
PO2	Pet	Casa Grande Station	Other Community Facilities		
PO3	Pet	Petaluma Post Office	O1	Nov	Novato City Hall
PO4	Pet	Regional Post Office	O2	Pet	Veterans Memorial Building
Park and Ride Facilities			O3	Pet	Sonoma-Marin Fairgrounds
T4	Nov	Alameda del Prado at US 101	O4	Pet	Boys & Girls Club
T5	Nov	Rowland Boulevard (2 lots) at US 101	O5	Pet	Petaluma Senior Center
T6	Nov	Atherton Avenue (2 lots) at US 101	O6	Pet	Petaluma Community Center
T7	Nov	Atherton Avenue at SR 37	Other Transportation Facilities		
T8	Pet	Lakeville Road at US 101	T1	Nov	Gnoss Field
T9	Pet	Sonoma-Marin Fairgrounds	T2	Nov	Transit Transfer Point
T10	Pet	Petaluma Boulevard at US 101	T3	Pet	Petaluma Marina

Nov = Novato; Pet = Petaluma
Source: Parsons, 2005.

Figure 3.1-6 Public and Cultural Facilities in the MSN Study Area



Schools

There are 25 public and three private elementary, middle, and high schools in the study area. Public schools in the study area are within the jurisdiction of the Novato Unified School District, Petaluma School District, and Old Adobe Union School District. Also located in the study area are the College of Marin-Indian Valley and the Marin School of Arts and Technology, both in the City of Novato.

Libraries

Libraries in the study area include the Novato Library at 1720 South Novato Boulevard and the Petaluma Regional Library at 100 Fairgrounds Drive.

Other Cultural Facilities

There are a number of cultural facilities within the study area, including the Marin Museum of the American Indian, the Novato History Museum, the Margaret Todd Senior Center and Community House in the City of Novato and the Oldest House North of the San Francisco Bay in the City of Petaluma.

3.1.6.3 Impacts

Public and Cultural Facilities

Fixed HOV Lane Alternative. No public schools, libraries, emergency facilities, or cultural facilities would be displaced or impacted by the Fixed HOV Lane Alternative. The long-term effect of the Fixed HOV Lane Alternative would be to reduce congestion and diversion of freeway traffic to local streets, thereby enhancing access to public and cultural facilities. In the short-term, during construction, access to these facilities could be interrupted and community members would be inconvenienced. Under the Fixed HOV Lane Alternative, this temporary disruption could affect facilities in Novato and Petaluma.

Reversible HOV Lane Alternative. Because the footprint, alignment, and scope of work for the two build alternatives is identical, the Reversible HOV Lane Alternative would have the same effects to public and cultural facilities described above for the Fixed HOV Lane Alternative. Short-term disruptions to access could occur during construction, but there would be no long-term impacts to public and cultural facilities.

Access Options. Each Access Option would have a different footprint area, and thus could affect different resources. As mentioned previously, however, the public and cultural facilities in the project corridor are concentrated within the

Novato and Petaluma city limits. There are no public and cultural facilities in Segment B, where the Access Options would be implemented. Therefore, none of the Access Options would have an effect on public and cultural facilities.

No Build Alternative. In the long-term, no public schools, libraries, emergency facilities, or cultural facilities would be displaced or impacted by the No Build Alternative. In the short-term, routine maintenance and upkeep of US 101 could temporarily disrupt access to public and cultural facilities.

Relocations

According to the 2007 Uniform Relocations Assistance Program (Appendix E), one residential unit, situated on an agricultural property approximately 600 m south of Kastania Road on the west side of US 101, would require acquisition prior to construction of the MSN Project. This represents less than 1 percent of the total occupied dwelling units in the study area. Based on 2000 data for Census Tract 1507.01 Block Group 2, approximately two residents would be relocated. Full appraisals would be conducted prior to acquisition of the property to be relocated to determine the market value of the property based on current market conditions.

As there is only one potential relocation, there are adequate resources in the cities of Novato and Petaluma to accommodate relocation of the displaced residential unit.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.). Please see Appendix I for a copy of the Department's Title VI Policy Statement.

Reversible HOV Lane Alternative. Because the Reversible HOV Lane Alternative would have the same footprint and roadway improvements as the Fixed HOV Lane Alternative, the relocation impacts described for the Fixed HOV Lane Alternative also apply to the Reversible HOV Lane Alternative.

No Build Alternative. The No Build Alternative proposes routine maintenance and upkeep of the existing US 101 facility. Since no new improvements or expansion of the right-of-way is included as part of this alternative, the No Build Alternative would not result in any relocations.

3.1.6.4 Avoidance, Minimization, Mitigation Measures

Construction Traffic Management Plan. In order to minimize access impacts to public and cultural facilities during the construction period, a transportation management plan shall be developed to include pre-trip and on-route roadway conditions and information during construction operations. Elements of the plan would address techniques for announcements and public communications. These tools could include a Public Information Campaign, Highway Advisory Radio, and Intelligent Transportation Systems (ITS) elements such as traffic monitoring stations and changeable message signs.

By providing real-time information on highway conditions and construction activities, these measures are expected to reduce construction-related impacts to community facilities. Motorists would tend to continue using the highway instead of diverting to local streets if they could reasonably predict travel times.

Relocation Assistance. Where right-of-way acquisitions cannot be avoided, Caltrans would comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act summarized in Appendix E. Caltrans shall also offer assistance under the Relocation Assistance Program (RAP), based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. Please see Appendix E for a summary of the RAP.

It is Caltrans' policy that persons displaced as a result of highway programs shall receive fair and humane treatment and shall not suffer unnecessarily as a result of programs designed for the benefit of the public. A summary of relocation benefits is included in Appendix E.

Compensation for loss of direct access to US 101 for property owners who currently have direct-access rights will be determined based on Access Option 12b, as part of the Preferred Alternative. The locations of new potential access via roads or interchanges would be developed with input from affected property owners.

3.1.7 Environmental Justice and Title VI of the Civil Rights Act (1964)

3.1.7.1 Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2009, this was $22,050 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in the project. The Department's commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix I of this document.

It has been the U.S. Department of Transportation's (DOT) longstanding policy to actively ensure non-discrimination under Title VI of the Civil Rights Act of 1964, and more recently under the DOT's Order to Address Environmental Justice in Minority Populations and Low-Income Populations (1997) and the FHWA's Actions to Address Environmental Justice in Minority Populations and Low-Income Populations 6640.23 (1998). Title VI states that "no person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of or be subjected to discrimination under any program or actively receiving federal financial assistance." In accordance with EO 12898 and Title VI, Caltrans conducted a study to determine whether the MSN Project would cause disproportionate impacts to minority or low-income populations within the project study area.

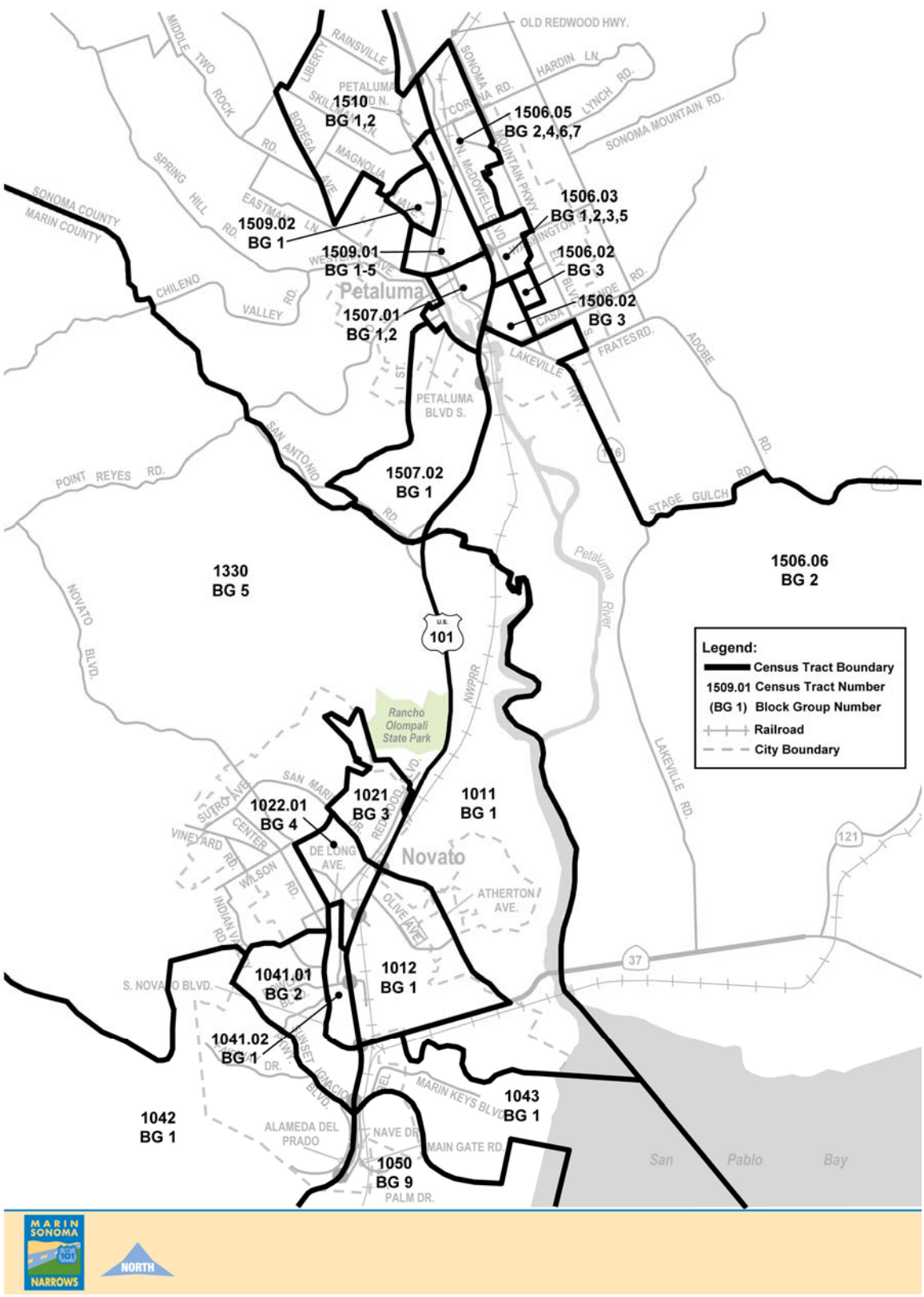
3.1.7.2 Affected Environment

Figure 3.1-7 shows the census tracts used in the socioeconomic study area for the environmental justice study.

Ethnic Composition

The project study area includes a variety of neighborhoods and multi-ethnic populations in proportions comparable to Sonoma County and the cities of

Figure 3.1-7 Socioeconomic Study Area Census Tracts



Novato and Petaluma. The City of Novato is slightly less diverse than the study area with a minority population of approximately 21 percent (Table 3.1-6).

Table 3.1-6 Ethnic Composition

Geographic Area	Total Persons	White	%	Black or African American	%	Hispanic	%
Study Area	57,324	42,563	74%	852	1%	9,320	16%
Marin County	247,614	194,254	79%	6,946	3%	27,351	11%
Sonoma County	458,614	341,686	75%	6,116	1%	79,511	17%
City of Novato	47,639	36,336	76%	893	2%	6,229	13%
City of Petaluma	54,548	41,996	77%	581	1%	7,985	15%

Geographic Area	Asian	%	American Indian/ Alaska Native	%	Native Hawaiian/ Other Pacific Islander	%	Some Other Race/Two or More	%
Study Area	2,495	4%	173	0.3%	92	0.2%	1,829	3%
Marin County	11,078	4%	630	0.3%	330	0.1%	6,700	3%
Sonoma County	13,786	3%	3,477	0.8%	828	0.2%	13,210	3%
City of Novato	2,442	5%	113	0.2%	71	0.2%	1,526	3%
City of Petaluma	2,089	4%	173	0.3%	85	0.2%	1,639	3%

Source: 2000 U.S. Census Bureau

Income

Table 3.1-7 summarizes information on median income and the percentage of the population under the poverty line within the study area, Marin County, Sonoma County and the cities of Novato and Petaluma. The 2000 median household income in these jurisdictions was $63,733 in the study area, lower than in Marin County, and higher than in Sonoma County, the City of Novato, and the City of Petaluma.

Table 3.1-7 Household Income

Geographic Area	Median Household Income	% Population Below Poverty Level
Study Area	$63,766	6.3%
Marin County	$71,306	5.5%
Sonoma County	$53,076	7.0%
City of Novato	$63,453	4.6%
City of Petaluma	$61,679	5.2%

Source: 2000 U.S. Census Bureau

In the study area, 6.3 percent of households live below the poverty level, less than in Sonoma County, but more than in Marin County or the cities of Novato and Petaluma.

For the purposes of this analysis, the potential for environmental justice impacts were identified when the population in any census tract block group met or exceeded either of the following criteria:

- The census tract block group contained 50 percent or more minority or low-income population; or
- The percentage of minority or low-income population in any census tract block group was more than 10 percentage points greater than the average in the city and/or county in which the census tract block group is located.

Based on 2000 U.S. Census Bureau data for the study area, populations in five out of 36 census block groups located adjacent to US 101 shown in Figure 3.1-8 qualify as environmental justice communities, for the following reasons:

- Census Tract 1506.03; Block Group 2 – Located east of US 101, just south East Washington Street, this block group has a minority population of approximately 60 percent.
- Census Tract 1506.03; Block Group 5 – Adjacent to the southeast corner of the US 101/East Washington Avenue Interchange, this block group has a low-income population of nearly 17 percent.
- Census Tract 1509.01; Block Groups 1 and 2 – Located west of US 101 and north of Washington Street, these block groups have the highest incidence of low-income population with approximately 27 and 23 percent, respectively.
- Census Tract 1330; Block Group 5 – West of US 101, north of the City of Novato in Marin County, the low-income population accounts for nearly 17 percent of the block group's total population.

Figure 3.1-8 Environmental Justice Communities

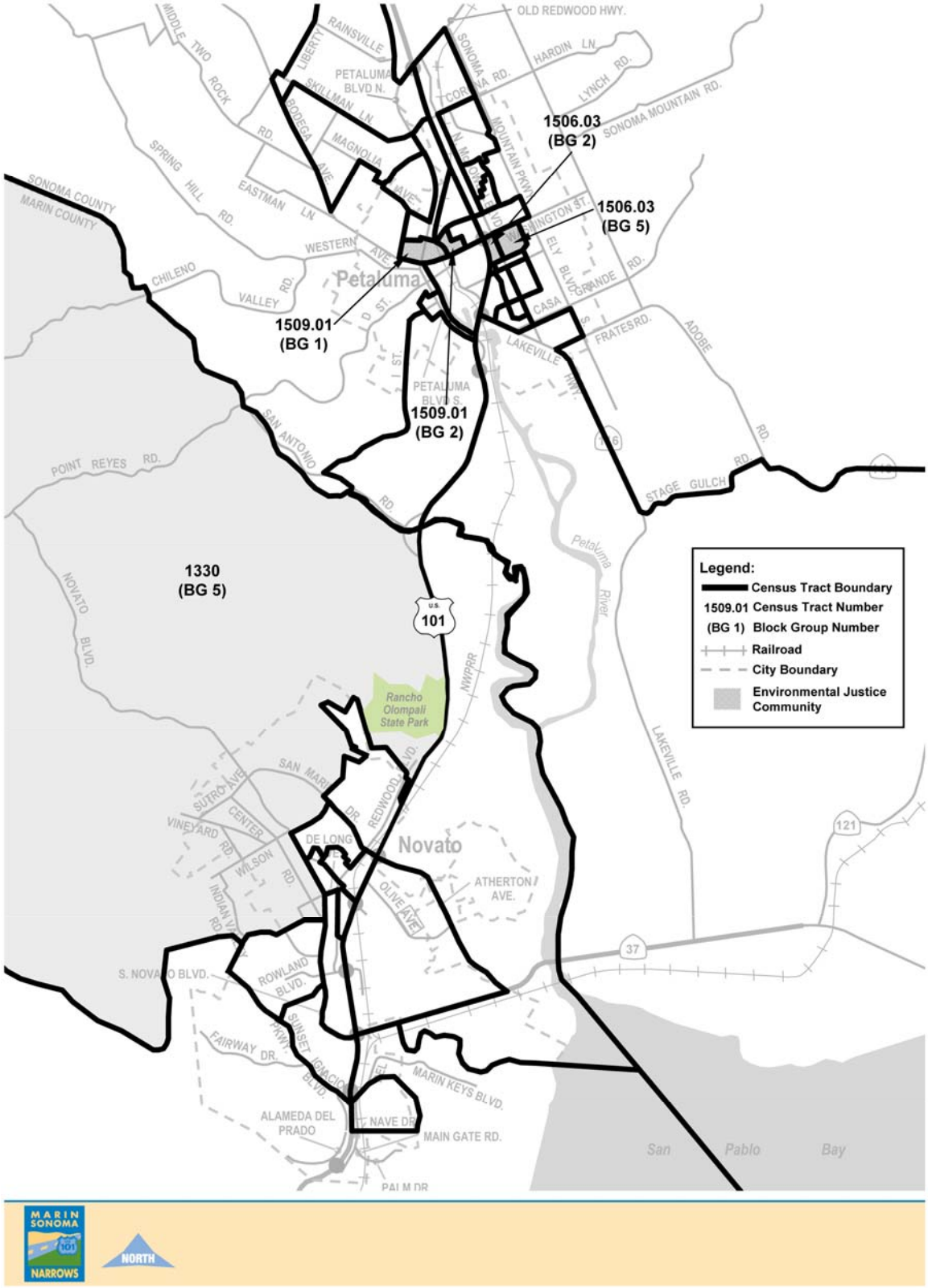


Table 3.1-8 shows the percentage of minority populations and households below the poverty line in the study area.

Table 3.1-8 Minority and Low-Income Populations in the MSN Study Area[1]

	Study Area[1]	Marin County	Sonoma County	City of Novato	City of Petaluma
% Minority	26%	21%	26%	24%	23%
% Low-Income	7%	7%	8%	6%	6%

Source: 2000 U.S. Census Bureau.

Note:

[1] The Study Area percentages are based on population from Marin County, Sonoma County, Novato, and Petaluma, and therefore the concentration of minority or low-income residents can vary from that from each of the individual jurisdictions.

3.1.7.3 Impacts

Environmental Justice

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would not cause disproportionately high and adverse effects on the minority or low-income populations in the MSN Project corridor, four of which are in Segment C and one of which is in Segment B. Transportation benefits of the Fixed HOV Lane Alternative would accrue equally to area residents. Noise and air quality impacts would be distributed evenly through the project area and would not be concentrated in any area of minority or low-income residents. Noise abatement measures are recommended wherever noise abatement criteria are met and would be expected to prevent disproportionate impacts to any particular area. The single residential displacement is in an area that is not identified as a low-income or minority neighborhood. As a result, the Fixed HOV Lane Alternative would not adversely or disproportionately affect environmental justice communities in the MSN Project corridor.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative has the same footprint and roadway improvements as the Fixed HOV Lane Alternative, except that the HOV lane in the US 101 median would only operate in one direction, depending on the time of day. This one difference in the design of the two Build Alternatives would not result in substantial noise, air, aesthetic, or other considerations such that the five environmental justice communities would be adversely or disproportionately affected. As a result, the analysis presented above for the Fixed HOV Lane Alternative with respect to

environmental justice would be identical for the Reversible HOV Lane Alternative. In summary, the Reversible HOV Lane Alternative would not cause disproportionately high and adverse effects on any minority or low-income populations.

Access Options. The four Access Options propose a series of interchanges, frontage roads, and bicycle/pedestrian facilities to replace access and enhance non-automobile connectivity in Segment B. The Access Options are comparable with respect to impacts on land use, public and cultural facilities, utilities, emergency services, transit, parking, bicycle and pedestrian access, noise, air emissions, and hazardous materials. Furthermore, the Access Options would not cause a disproportionate environmental burden on CT 1330 Block Group 5 compared to any other block group in Segment B. Moreover, construction-related impacts such as air, noise, and traffic detours can all be mitigated using best management practices (BMPs). Therefore, the Access Options would not have a disproportionately high or adverse effect on the environmental justice community residing in Census Tract 1330 Block Group 5.

No Build Alternative. The No Build Alternative would involve routine maintenance and upkeep of US 101. As such, occasional improvements would be made throughout the MSN Project corridor and would not be concentrated in Petaluma or the Marin portion of Segment B, where the environmental justice communities are located. Accordingly, the No Build Alternative would not cause disproportionately high and adverse effects on any minority or low-income populations.

3.1.7.4 Avoidance, Minimization, Mitigation Measures

No avoidance, minimization or mitigation measures are needed, because there would be no disproportionate impacts to minority or low-income communities.

3.1.8 Utilities/Emergency Services

3.1.8.1 Affected Environment

This section addresses utilities, such as water, wastewater, and telecommunications, and emergency services provided by various local and state agencies.

Utilities

The North Marin Water District (NMWD) provides water services to approximately 56,000 people living in the City of Novato and surrounding areas. The Marin Municipal Water District (MMWD) currently provides about 40 percent of the annual potable water needs to both North Marin and the MMWD. Waste water collection, treatment and disposal services are provided by the Novato Sanitary District. The District also is responsible for refuse disposal, recycling, and green waste collection through its franchise collector, Novato Disposal Service.

In the City of Petaluma water services are provided by the Sonoma County Water Agency (SCWA) and the City. SCWA facilities include three dams, three reservoirs, five collector wells, six booster stations, and 16 water storage tanks. SCWA sells water to the City of Petaluma, which provides water treatment and distribution to the residents of Petaluma. Waste water collection and treatment are provided by the City of Petaluma and solid waste collection, disposal and recycling are provided by Waste Management.

Telecommunication service providers in the project area include AT&T and Verizon.

Natural gas and electric service is provided to the project area by Pacific Gas & Electric (PG&E).

PG&E owns and operates gas and electric transmission and distribution facilities located within and adjacent to the proposed project.

Police and Emergency Services

Police protection and traffic enforcement in the study area are provided by the Marin County Sheriff's Office, Sonoma County Sheriff's Department, California Highway Patrol, and the police departments of the cities of Novato and Petaluma. The Novato Police Department is located at 909 Machin Avenue, Novato; the Petaluma Police Department precinct station is located at 969 Petaluma Boulevard North, Petaluma.

Fire protection and emergency medical rescue services for the study area are provided by the Marin County Fire Department; the Marin County Sheriff's Office, Office of Emergency Services; Sonoma County Department of Emergency Services; and the fire departments of the cities of Novato and Petaluma. Eight fire

stations are located within the study area. Figure 3.1-6 in Section 3.1.6, Community Character and Cohesion, identifies the locations of the vital local services. Table 3.1-9 lists the various emergency providers.

Table 3.1-9 Emergency Service Providers

Number Key	City	Name
F1	Novato	Fire Station #1
F2	Novato	Fire Station #2
F3	Novato	Fire Station #3
F4	Novato	Fire Station #4
F5	Novato	Fire Station #5
F6	Petaluma	Fire Station #1
F7	Petaluma	Fire Station #2
F8	Petaluma	Fire Station #3
H1	Novato	Novato Community Hospital
H2	Petaluma	Petaluma Valley Hospital
P1	Novato	Police Station
P2	Petaluma	Police Station
M1	Novato	US Coast Guard
M2	Petaluma	National Guard Armory
Note: Refer to Figure 3.1-6 for locations according to the number key.		

3.1.8.2 Impacts

Utilities

Fixed HOV Lane Alternative. Under the Fixed HOV Lane Alternative, preliminary utility investigations have identified the location and extent of existing service lines within the project boundaries. Final verifications would be performed during the project's design phase. The need for positive location (potholing) in accordance with Caltrans' Policy on High and Low Risk Underground Facilities within Highway Rights of Way (January 1997) would be determined once utility facilities have been plotted and compared to the proposed right-of-way for the Preferred Alternative.

At this preliminary stage, the proposed widening and mainline realignment under the Fixed HOV Lane Alternative would trigger the need to relocate some existing underground and above-ground utilities outside the right-of-way.

The relocation of utilities would result in localized construction impacts and could result in temporary interruption of service. The affected utilities identified in the

preliminary investigations involve gas, electric, telephone, cable TV, sewer, and water. Prior to any relocation, Caltrans would enter into utility agreements with each of the providers, including, but not limited to, the City of Petaluma, PG&E, AT&T, SCWA, and Comcast. All utilities will either be relocated along the access roads, which will eventually be turned over to Marin and Sonoma Counties, or outside of proposed state right-of-way. This will ultimately put all utilities outside of the Caltrans right-of-way.

The areas where the utilities will be relocated have been included in the project study area upon which this FEIR/S is based. Therefore, CEQA review for the relocated utilities is being conducted as part of the FEIR/S. However, the California Public Utilities Commission (CPUC) may need to undergo further CEQA reviews associated with these relocations during the design phase of the project.

Water Services

The MSN Project will require approximately 50 percent or 7.1-miles of NMWD's aqueduct to be relocated between Kastania Road and the City of Novato. Currently NMWD and MMWD both have plans to upsize their current facilities. It is Caltrans policy to replace comparable facilities affected by the construction of a project.

Gas and Electric Transmission

Some PG&E facilities are in conflict with this project will need to be relocated. PG&E may need to relocate approximately 7.7 miles of electric transmission line and 8.5 miles of high pressure gas transmission lines. Appendix P of this FEIR/S identifies the specific gas and electrical transmission stations that will be relocated as part of the MSN Project. A brief, general description of the activities associated with the transmission line relocations follows:

Gas Transmission Facilities

For the segment of pipeline to be relocated, PG&E will need to trench along the new alignment separating topsoil from subsoil, string and weld together sections of new pipe, place the new pipe in the trench, hydrotest the new line and then backfill the trench first with the subsoil and finally with the topsoil. Finally, the new pipeline will be tied into the existing pipeline at the beginning and end of the relocation. Surface restoration will be provided to return the vegetative cover to preconstruction type and density. The existing pipeline affected by the Caltrans project will either be abandoned in place or removed depending on whether its

present location would be directly affected by the proposed project. Abandonment involves the cleaning of the pipeline, filling it with either an inert gas such as nitrogen or with a concrete slurry, and capping the ends with steel plates. Removal involves trenching along the line to expose it, cutting the pipe into manageable sections and removing them from the trench, then hauling them from the site for disposal or recycling. The trenching, backfill and surface restoration would be similar to the relocation activity described above. A construction working strip approximately 100 ft wide generally centered on the pipeline alignment is required to conduct the above-described work. Equipment used will be backhoes, dump trucks, excavators, crew trucks and welding trucks and approximately 12 to 16 workers.

Electric Transmission Facilities

PG&E will survey and stake the new pole locations, frame and set the wood poles and then string conductor (wire) on the new line. The existing pole line will need to be de-energized at the beginning and end of the relocation so that the segment of the new pole line may be connected to the existing pole line. If the relocated alignment precludes the use of guy wires, self-supporting tubular steel poles (TSP) may be required for angle points. Depending on the angle, a concrete foundation may be required rather than the direct buried TSP. The old poles will also be removed by cutting them off at ground level and hauling them offsite for disposal. A construction work area approximately 80 ft in diameter at each new pole location and each pole to be removed is required to conduct the above described work. Equipment used will be line trucks and bucket trucks and approximately 8 to 12 workers. A pole setting excavator will be necessary if PG&E does work in the winter months.

Reversible HOV Lane Alternative. The proposed right-of-way for the Reversible HOV Lane Alternative would be the same as the Fixed HOV Lane Alternative. As a result, the project footprints would be the same for the two Build Alternatives, and the impacts on utilities would be the same. The analysis for the Fixed HOV Lane Alternative and the Access Options would therefore apply to the Reversible HOV Lane Alternative.

Access Options. The Access Options involve repaving existing roads, constructing new frontage roads with bicycle and pedestrian facilities, replacement and modified bridgework, and new interchanges. Because the majority of utility relocations will occur in Segment B due to extensive mainline

realignment, which will conflict with existing water lines, gas and electric transmission lines, and telephone and sewer lines, all impacts associated with Segment B and disclosed in the FEIR/S can be attributed in part to utility relocation activities. These impacts will be similar to those described under the Build Alternatives. Impacts would also involve installing new smaller feeder lines to individual properties. As with the mainline alternatives, the impacts would be localized construction-related disturbances and possibly temporary service interruptions. Each Access Option would result in comparable impacts to utilities.

No Build Alternative. Under the No Build Alternative, routine maintenance and upkeep of the existing freeway and expressway portions of the project corridor would not be expected to adversely affect utilities; no relocation of sewer, water, telephone, gas and electric service lines would be necessary.

Emergency Services

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would alleviate congestion along US 101 and thereby provide police, fire, and other emergency service providers with improved response times. The upgrading of Segment B from expressway to freeway standards would eliminate the existing at-grade connections, correct the substandard horizontal and vertical curves, and improve circulation through the provision of overcrossings and/or interchanges. All of these improvements would enhance the ability of emergency responders to react to calls for service.

In addition, under the Fixed HOV Lane Alternative, the mixed flow lanes would be adjacent to the HOV lanes, without any barrier separating the two. With this configuration, emergency vehicles would have full maneuverability to move between the mixed flow and HOV lanes.

During the construction period, lane closures, detours, and slow-moving construction vehicles could interfere with and delay emergency vehicle access and response.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would also improve access and response times for emergency service providers, as described for the Fixed HOV Lane Alternative above. In particular, this alternative would also call for upgrading Segment B to freeway standards, which would enable better emergency response.

A key difference, however, is the Reversible HOV Lane Alternative would require barriers to separate the HOV lanes from the mixed flow lanes. These barriers would make it more difficult to remove a disabled vehicle or enable emergency vehicle access. In addition, removing a disabled vehicle from the reversible HOV lane would be more difficult than with the fixed HOV lane because there would be only one location to access the reversible lane. For example, if the reversible lane is operating in the southbound direction and a vehicle becomes disabled near Olompali SHP, a tow truck coming from Novato would have to go north to the Petaluma Blvd South interchange, enter the freeway in the southbound direction to access the reversible lane. With the fixed HOV lane in the same situation, the tow truck could turn around at the Redwood Landfill Overcrossing.

Potential interference with emergency response vehicles during the construction period would be same with the Reversible HOV Lane Alternative as with the Fixed HOV Lane Alternative.

Access Options. Each of the Access Options is designed to maintain access to individual properties and businesses and to serve major and local traffic movements. As a result, each Access Option would preserve emergency access to properties and areas on both sides of US 101 in Segment B. Through a system of interchanges, overpasses, and frontage roads, each Access Option would provide adequate emergence access, and accordingly, no adverse effects would be anticipated.

No Build Alternative. Under the No Build Alternative, there are no roadway and/or interchange improvements proposed other than routine maintenance and upkeep. As a result, the No Build Alternative would not impede emergency response. This alternative would not offer any congestion relief along US 101 in the future, resulting in lengthier response times by emergency vehicles, compared to the Build Alternatives.

3.1.8.3 Avoidance, Minimization, and/or Mitigation Measures

Utilities. It is customary for Caltrans to enter into agreements with utility companies to cover the activities and coordination involved in relocating utilities. These agreements will clearly outline responsibilities to ensure that any interruptions to utility services, if necessary, would be minor. Caltrans will work with utility companies to facilitate the removal of utility lines from the US 101

mainline right-of-way prior to construction of future phases of the project involving the mainline.

Police and Emergency. A Traffic Management Plan (TMP) will be developed for the project in consultation with the local emergency service providers. In the TMP, Caltrans will identify the various emergency service providers in the cities of Novato and Petaluma and Marin and Sonoma counties. Provisions will be included in the construction contract requiring the contractor to coordinate with these providers when developing temporary detour plans and lane closures. The construction contract documents will also require the contractor to notify emergency service a minimum of two weeks in advance of any road closures and detour routes.

3.1.9 Transit and Parking

3.1.9.1 Affected Environment

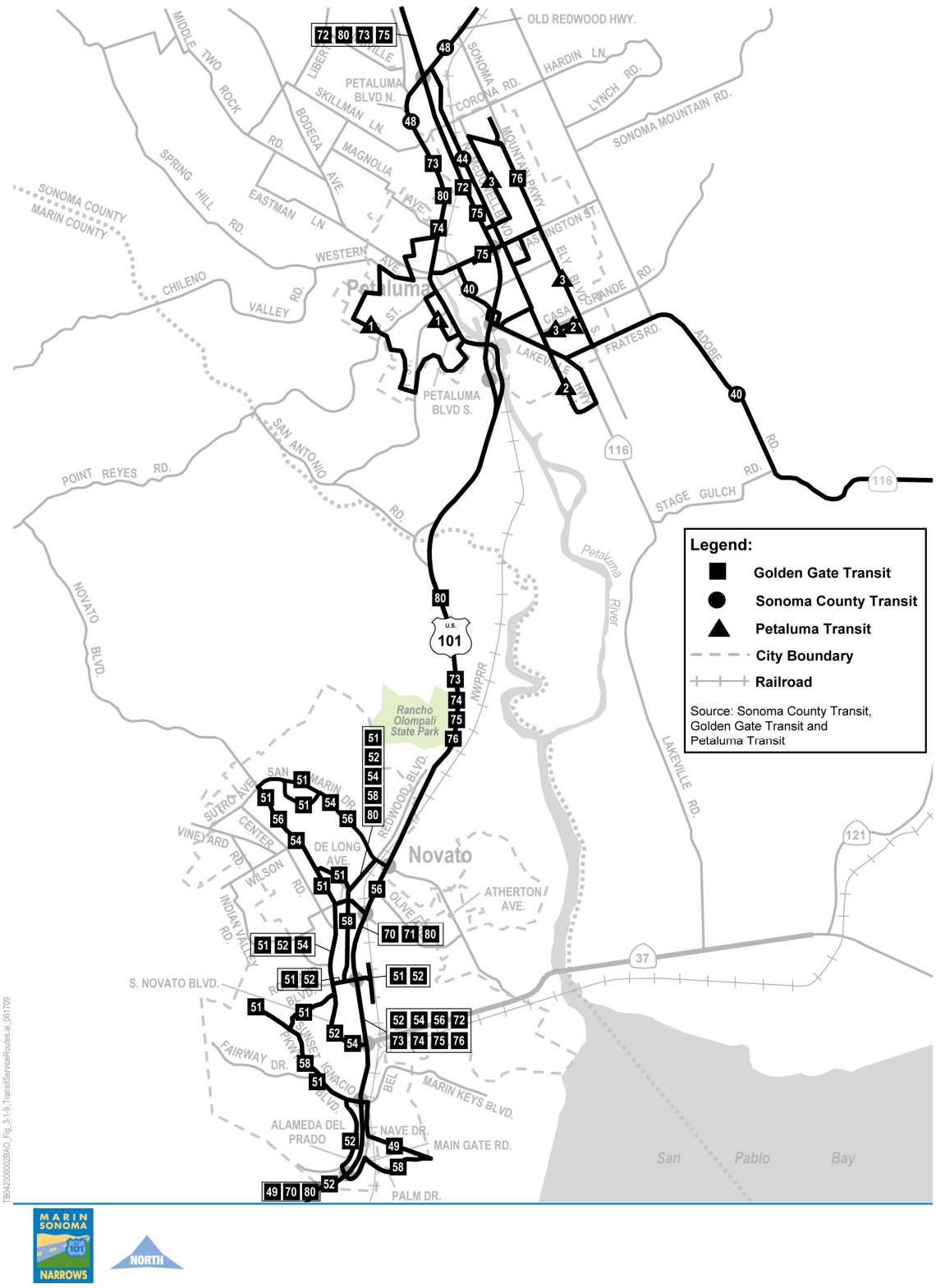
Transit

Transit services in the study area are provided by Sonoma County Transit, Golden Gate Transit, and Petaluma Transit. Figure 3.1-9 shows the service routes in the project study area by transit agencies described below.

Sonoma County Transit. Sonoma County Transit provides intercity service in Sonoma County and local service in Rohnert Park, Cotati, Guerneville, Sebastopol, and Windsor. Sonoma County Transit operates 24 bus routes, including six local and three express routes throughout Sonoma County, and offers connections to local transit services, including Petaluma Transit. Links are also provided to the Mendocino Transit Authority for service to the Sonoma/Mendocino Coast and Golden Gate Transit for regional service to Marin and San Francisco Counties. Sonoma County Transit operates three bus routes in the City of Petaluma: Route 40, which provides weekday, intercity service between Petaluma and Sonoma County destinations; Route 44, which provides daily service between the cities of Petaluma and Santa Rosa; and Route 48, which provides daily service between the cities of Petaluma, Rohnert Park, Cotati, and Santa Rosa. None of these bus routes uses US 101 within the project area.

Golden Gate Transit. Golden Gate Transit provides fixed-route bus service within Marin, Sonoma, San Francisco, and Contra Costa Counties, including the City of Novato. Golden Gate Transit provides service within the project area as

Figure 3.1-9 Transit Service Routes



follows: Routes 49, 51, 52, 54, 56, 58, 70, 71, 80, and 153 operate within Novato; Routes 73, 74, 75, 76, and 80 operate within Petaluma; Routes 52, 54, 56, 70, 71, 72, 72X, 73, 74, 75, 76, and 80 operate along the portions of US 101 affected by the project.

Petaluma Transit. Petaluma Transit provides four local bus routes in the City of Petaluma and connections to Sonoma County Transit and Golden Gate Transit for intercity trips. None of Petaluma Transit's four bus routes use US 101 within the project area.

Sonoma-Marin Area Rail Transit (SMART). The proposed Sonoma-Marin Area Rail Transit (SMART) project would provide passenger rail service along approximately 70 miles of the SMART corridor from Cloverdale in Sonoma County to Larkspur in Marin County, with 14 rail stations, passing sidings, and a rail maintenance facility. The rail line follows an existing rail line that was previously owned by the Northwest Pacific Railroad. The SMART District is sponsoring the project and has completed preliminary engineering and an EIR under CEQA. The SMART District is currently analyzing the potential environmental effects of this project pursuant to NEPA. SMART adopted a Final Supplemental EIR in July 2008 to address the addition of weekend passenger service, alternative site for the Novato South Station, an alternative type of vehicle and changes to proposed NCRA freight service.

There are four crossings between the SMART tracks and US 101: (1) Franklin Overhead (OH), (2) North Novato OH, (3) US 101/SR 116 Separation and Overhead (SOH), and (4) North Petaluma OH.

Parking and Park-and-Ride Facilities

Existing off-street parking in the project vicinity is primarily available at shopping centers, park-and-ride lots, and other businesses adjacent to the US 101 corridor. Parking is also available at park-and-ride lots along the US 101 corridor in Novato and Petaluma. Park-and-ride lots allow commuters to park their vehicles in a parking lot and transfer to transit services and carpool/vanpool opportunities, thereby promoting commute alternatives that reduce travel time and reduce air emissions. As an incentive to carpool, parking is free for carpoolers and serves as a convenient meeting place. Also, park-and-ride lots provide lockers for bike commuters.

The six park-and-ride lots located in the project vicinity are described below.

- Rowland Avenue/US 101 Park-and-Ride, Novato (east side of US 101, within the northeast and southeast quadrants of the interchange): The lot includes 240 parking spaces, 6 bike lockers and 1 bike rack, and is served by Golden Gate Transit.
- Atherton Avenue/US 101 Park-and-Ride, Novato (east side of US 101, adjacent to the northbound on-ramp): The lot includes 58 parking spaces and 2 bike lockers, and is served by Golden Gate Transit.
- South Petaluma Boulevard /US 101 Park-and-Ride (west side of US 101, near the ramp entrance): The lot includes 40 parking spaces and is served by Golden Gate Transit.
- Lakeville Street (SR 116) /US 101 Park-and-Ride (west side of US 101, within the southbound on-ramp loop quadrant): The lot includes 135 parking spaces and 4 bike lockers and is served by Sonoma County Transit and Golden Gate Transit.
- Washington Street/Payran Street Park-and-Ride (east of US 101, in the southwest quadrant of the East Washington Street Interchange): The lot includes 600 parking spaces, and is served by Sonoma County Transit, Golden Gate Transit, and Petaluma Transit.
- North Petaluma Boulevard/Gossage Avenue Park-and-Ride, Petaluma (west of US 101): The lot features 22 parking spaces, a shelter, and is served by Sonoma County Transit and Golden Gate Transit.

3.1.9.2 Impacts

Transit

Fixed HOV Lane Alternative. Under the Fixed HOV Lane Alternative, the long-term impact of the project on transit and carpooling/vanpooling operations would be positive. The HOV lanes provided under the Fixed HOV Lane Alternative would offer dedicated peak-hour capacity and a high level of traffic service to transit and carpool vehicles. This would improve travel times for riders of the Golden Gate Transit lines on US 101 and carpooling commuters, who would experience fewer delays. Not only would transit travel time be reduced but transit schedule reliability would be improved. Carpools and vanpools also would have improved speeds and reduced travel times. The improved speeds and schedule

reliability would work as incentives for commuters and other travelers to carpool and/or take advantage of local and express buses that would also use the HOV lanes. The Fixed HOV Lane Alternative would not interfere with proposed commuter rail service on the SMART line.

In the short term, however, construction activities would include modifications to freeway ramps to allow HOV bypasses and ramp metering, widening the median, and realignment of the mainline in Segments B and C. The resultant lane closures, detours, and construction activity would increase transit travel times and make transit schedules less reliable. This effect would be short-term and temporary.

Reversible HOV Lane Alternative. Like the Fixed HOV Lane Alternative, the Reversible HOV Lane Alternative would have a positive long-term impact on transit and carpooling/vanpooling. However, because the reversible HOV lane would only operate in one direction at any given time, those transit operators and carpools/vanpools that are traveling in the opposite direction of the reversible HOV lane would continue to travel in mixed flow and not experience congestion relief.

Access Options. Bus lines through Segment B all use US 101, i.e., none of the bus routes use the local frontage and access roads in this stretch of the project corridor. As a result, implementation of any of the Access Options would not affect transit in this segment in the long term.

During the construction period, lane closures, detours, and slow-moving construction vehicles could interfere with and delay buses and carpools/vanpools. The Access Options would have similar construction-period effects on transit services.

No Build Alternative. The No Build Alternative would not impact current transit operations in the corridor. There may be short-term interruptions during routine maintenance and upkeep of the existing freeway, but these would be minimal. In the long run, without congestion relief, delays on US 101 would worsen as described in Chapter 1, and schedule reliability for transit operators would be more difficult to maintain.

Sonoma-Marin Area Rail Transit (SMART).

Fixed HOV Lane Alternative. This is the Preferred Alternative. Under this alternative, the general location of the SMART railroad tracks in relation to

US 101 will not change. In Segment A of the MSN Project, the SMART corridor will be east of US 101 generally between SR 37 and just south of the De Long Avenue Interchange. Just north of the Novato Community Hospital, the rail line will pass under US 101 at the Franklin Overhead and transition to the west side of US 101. It will remain on the west side until just north of the San Marin Drive/Atherton Avenue Interchange, near the Petaluma Marsh Wildlife Preserve, where the tracks will switch back to the east side of US 101 at the North Novato Overhead.

Throughout Segment B, the SMART corridor would continue east of US 101. In Segment C, the SMART line will cross under the US 101 at the SR 116/ Lakeville Highway Separator and Overhead and proceed along the west side of US 101. A little more than half way through Segment C, the SMART line would cross US 101 for the fourth time at the North Petaluma Overhead.

During the construction of the Petaluma River Bridge, the project contractor will access the north bank of the river from SR 116 along the east side of US 101. The contractor will access the north bank by using an existing road along the SMART railroad tracks. Since access would be used when the railroad arms are open project construction will not affect SMART's operations at this location.

Reversible HOV Lane Alternative: The effects on the SMART rail line from the MSN Project would be identical to the effects under the Fixed HOV Lane Alternative described above.

Access Options: As stated under the Preferred Alternative, the SMART corridor would continue east of US 101 for most of Segment B. The SMART rail line would be accessible from US 101 at South Petaluma Boulevard, and there would be no conflicts with the rail line.

No Build: There would be no impacts to SMART under the No Build Alternative.

Parking and Park-and-Ride Lots

Fixed HOV Lane Alternative. Acquisition of property under the Fixed HOV Lane Alternative would affect approximately six parking spaces at the Plaza North Shopping Center in Petaluma. There are currently 1,500 parking spaces in the shopping center lot and there is sufficient room to reconfigure the lot for no net loss of parking spaces.

There would be no permanent impacts to park-and-ride lots. There would, however, be some temporary impacts as a result of project construction, as follows:

- Rowland Avenue/US 101, Novato: The lot would not be directly affected by operations; however, the northbound on-ramp may be temporarily/periodically closed during construction, possibly requiring lot users traveling northbound to use an alternate route during these times.
- Atherton Avenue/US 101 Park-and-Ride, Novato: Same as above.
- South Petaluma Boulevard/US 101: Although the lot would not be directly affected once mainline widening and realignment begins, the usefulness of the lot would be interrupted until the new roadway and adjacent interchange (with associated ramps) are completed.
- Lakeville Street (SR 116)/US 101 Park-and-Ride: The southbound on-ramp may be temporarily/periodically closed during construction, possibly requiring lot users to travel south.

Reversible HOV Lane Alternative. The effects of the Reversible HOV Lane Alternative on parking and park-and-ride lots would be identical to the effects described above for the Fixed HOV Lane Alternative, because the changes to the interchanges where the park-and-ride lots are identical under both Build Alternatives.

Access Options. The Access Options would not affect parking or park-and-ride lots, since none exist within Segment B.

No Build Alternative. The No Build Alternative would not impact parking or park-and-ride facilities within the project boundaries, since this alternative involves only routine maintenance and upkeep of existing facilities. Any interference or disruption related to mainline or ramp repairs or maintenance would be limited in duration and scope.

3.1.9.3 Avoidance, Minimization, and Mitigation Measures

Transit

Construction Detour Management Plan. Golden Gate Transit, Sonoma County Transit, and Petaluma Transit operate several bus routes along US 101 and local streets in the cities of Novato and Petaluma that would be temporarily affected

during construction. Mitigation measures for temporary impacts would include consultation with service providers regarding the selection of detour routes. Advance warning to the public using signs, fliers, and the public media would notify riders to expect delays due to the temporary detours.

Sonoma-Marin Area Rail Transit (SMART). Because no disruptions are anticipated to SMART's operations during MSN Project construction, no mitigation is warranted.

Parking and Park-and-Ride Facilities

There is sufficient room at the Plaza North Shopping Center in Petaluma to reconfigure parking spaces for no net loss of the parking supply; therefore, the parking lot would be restriped or otherwise reconfigured to replace the six parking spaces displaced under either Build Alternative.

3.1.10 Traffic and Transportation

Introduction

This section includes a discussion of the impacts of the Build and No Build Alternatives on future traffic congestion along US 101. The discussion is based upon the Caltrans Traffic Operational Analysis Report, February 2005. The report defines a study area larger than the project boundaries, since traffic "upstream" and "downstream" of the project boundaries affects traffic flow and congestion within the project limits. The study area includes the freeway mainline from the Miller Creek Interchange in Marin County to the Old Redwood Highway Interchange in Sonoma County, including on-ramps and off-ramps.

The traffic study began before Access Options 4b, 12b, 14b, and 14d were identified for evaluation. However, new interchange(s) proposed as part of these Access Options would not alter the results of the forecast freeway volumes or ramp volumes for the two intersections analyzed in the traffic study.

The removal of direct access to US 101 from a number of roadways and driveways in Segment B, as well as the addition of new interchanges, would improve access and circulation in this segment. Access to US 101 from these roadways and driveways would be provided by new interchanges accessed via a new access road system. The proposed interchanges would allow vehicles to accelerate and decelerate on and off the freeway from the interchange on- and off-ramps instead of on US 101 itself. This would make it easier to enter and exit the

flow of traffic and eliminate the need to cross on-coming traffic to cross the freeway.

In addition to the US 101 segments, Caltrans identified the following two critical intersections to include in the traffic study:

- US 101 northbound off and on ramps at Atherton Avenue; and
- US 101 southbound off and on ramps at Atherton Avenue.

This section also addresses bicycle and pedestrian routes, which are an important component of the transportation network in Marin and Sonoma Counties.

3.1.10.1 Regulatory Setting

Congestion Management Program

The Congestion Management Program (CMP) was established by voter approval in 1990. The purpose of the program, which applies to all counties in California with populations greater than 50,000, was to establish a flexible and effective transportation planning and programming process to allocate the proceeds from an accompanying nine-cent gas tax increase. In developing their plans, local counties were charged with identifying routes of regional significance, defining acceptable levels of congestion on these routes, monitoring and regularly reporting on the operations of the routes, and establishing a program to maintain acceptable operational levels through trip reduction and travel demand management. Counties were also required to propose a seven-year capital improvement program (CIP) to achieve roadway and transit performance standards.

TAM is the local agency responsible for preparation of the Marin County CMP. The most recent CMP was adopted in 2005. This CMP was notable in that it had the benefit of two new funding sources to supplement existing sources. The new sources included Measure A, a local tax ballot measure approved by Marin County voters in 2004; and Regional Measure 2, a regional measure that increased tolls on all State-owned Bay Area bridges by $1.

The 2005 CMP Update includes eight performance measures that reflect TAM's continued commitment to a multimodal transportation system:

1. Highway Level of Service;
2. Peak-Hour Travel Time;

3. Person Throughput;
4. Vehicle Miles Traveled on Congested Highways;
5. Jobs/Housing Balance;
6. Transit Headways;
7. Transit Coordination; and
8. Pedestrian and Bicycle Investment.

With respect to US 101, roadway segments that operate at a lower level of service (LOS) than the standard that was established in 1991 are "grandfathered" and allowed to continue to operate at a lower LOS standard level until such time as they are improved or the traffic load is diverted. Freeway segments that operated at LOS F in the 1991 CMP qualify as "grandfathered" segments. US 101 is one of the grandfathered roadways.

In developing its CIP, TAM's procedure for identifying specific highway and arterial projects consider the following:

1. Improvements that reduce traffic congestion to acceptable levels for the most vehicles;

2. Improvements that are the most cost effective;

3. Improvements on facilities with higher existing traffic volumes;

4. Improvements on facilities that are operating poorly based on existing traffic (not projected growth); and

5. Improvements that are lower cost.

Two additional considerations, described below, are used to identifying potential projects for purposes of the CIP.

1. **Operational characteristics.** If the project would result in shifting a capacity problem to another location, the effects of the downstream bottleneck are considered when setting priority for the project that ranks highest for cost effectiveness.

2. **Current deficiencies.** Projects that would eliminate existing deficiencies are prioritized above those that would eliminate future problems.

Based on these factors, the MSN Project is in Marin County's CIP.

As there is no officially designated Congestion Management Agency for Sonoma County, SCTA produces a Countywide Transportation Plan in lieu of a formal CMP (see discussion below).

Countywide Transportation Planning

Marin County. The Marin County transportation plan, entitled Moving Forward: A 25-Year Transportation Vision for Marin County (Transportation Vision Plan), was completed in February 2003 by the Marin County Congestion Management Agency (CMA), in collaboration with the Marin County Board of Supervisors, Marin County Transit, and local citizens. As a blueprint for the County's transportation future, the Transportation Vision Plan calls for enhanced local bus transit, additional pedestrian and bike options, improved local streets and interchanges, the SMART passenger rail project, increased express bus and ferry service, the development of transit centers as important multimodal hubs, and completion of the US 101 HOV lanes.

The MSN Project falls entirely within the "U.S. 101 Corridor" sub-area of the Transportation Vision Plan. For this corridor, the Plan calls for a variety of improvements including SMART passenger rail, express bus service, a north-south bikeway, HOV lane additions, and ferry service expansion. These improvements are projected to remove nearly 3,400 vehicle trips off of US 101 during peak periods; the equivalent of adding the capacity of one and a half freeway lanes. In addition, the plan estimates that implementation of these projects, including the MSN Project, would reduce delay by nearly 500 person-hours as a result of decreased congestion on US 101 through the Marin-Sonoma Narrows.

Sonoma County. In Sonoma County, SCTA has fulfilled the role of coordinating transportation planning and setting priorities for transportation funding. In 1995, SCTA prepared its final CMP and in 1997, SCTA prepared the Calthorpe Study. The document is the planning document that serves as the source of Sonoma County's input to the MTC for the RTP. In 2001, SCTA adopted the "2004 Comprehensive Transportation Plan for Sonoma County" providing SCTA with policy guidance and specific transportation improvements for development over the next 25 years. This was updated in the 2004 County Transportation Plan.

The 2001 and 2004 Plans are multi-modal plans that incorporate past efforts such as the 1995 Congestion Management Plan, the Sonoma/Marin County

Transportation and Land Use Study, and the Sonoma County Transportation Authority's Getting Around Sonoma County in 2020…A Vision for Our Future. The County Transportation Plan specifically acknowledges US 101 as crucial for the County, because US 101 serves local travel demand, regional commutes, tourism, and goods movement. The vision in the plan for US 101 includes less intense rush hour periods allowing traffic to move at a steady pace, midday traffic moving at the suggested speed limit, and a reduction in the "bottlenecks" at major interchanges and the Petaluma River Bridge.

Given the importance of US 101, Sonoma County also has a construction strategy for US 101 in Sonoma County. The strategy identifies and supports six major projects that involve improvements to interchanges and providing continuous HOV lanes between southern Marin County and Windsor in Sonoma County. As such, the MSN Project is recognized as a key element of the strategy and its implementation will depend on the availability of funding sources.

Bicycle/Pedestrian Facilities

FHWA 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 CFR 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 and FHWA are 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.

The Coast Guard approves location and clearances of bridges over navigable waters of the US under the General Bridge Act of 1946, as amended. The purpose of these Acts is to preserve the public right of navigation and to prevent interference with interstate and foreign commerce. The proposed location and clearance of bridges and causeways across navigable waters of the US must be submitted to and approved by the Commandant of the Coast Guard prior to construction. The General Bridge Act of 1946 is cited as the legislative authority for bridge construction in most cases.

3.1.10.2 Affected Environment

Within the study limits in Marin County, US 101 is a divided eight-lane freeway from the Miller Creek Road Interchange south of Novato to the SR 37/South Novato Boulevard Interchange in Novato. US 101 is a divided six-lane freeway from the SR 37/South Novato Boulevard Interchange to north of the Atherton Avenue Interchange, north of Novato. US 101 then continues as a divided four-lane expressway from north of the Atherton Avenue Interchange to the South Petaluma Boulevard Interchange in Sonoma County. From the South Petaluma Boulevard Interchange to the Old Redwood Highway Interchange, US 101 is a divided four-lane freeway.

There are three northbound speed change lanes within the study limits:

- between the Miller Creek Road on-ramp and the Nave Drive off-ramp;
- between the Ignacio Boulevard eastbound on-ramp and the eastbound SR 37 off-ramp; and
- between the westbound SR 37 on-ramp and the Rowland Boulevard off-ramp.

There are also three southbound speed change lanes within the study limits:

- between the South Novato Boulevard on-ramp and the eastbound Ignacio Boulevard off-ramp;
- between the Ignacio Boulevard on-ramp and the Alameda Del Prado off-ramp; and
- between the Alameda Del Prado on-ramp and the Miller Creek Road off-ramp.

Portions of the existing northbound and southbound HOV lanes between the SR 37/South Novato Boulevard Interchange and the North San Pedro Road Interchange in Marin County were also included within the study area. During peak commute periods, these lanes are restricted to vehicles with two or more occupants, motorcycles, and clean air vehicles. Southbound HOV lane hours are from 6:30 A.M. to 8:30 A.M. Northbound HOV lane hours are from 4:30 P.M. to 7:00 P.M.

Existing Mainline Operations

Caltrans' 2003 congestion monitoring studies indicate that recurrent delays occur within the study limits during the A.M. peak traffic period on southbound US 101 and during the P.M. peak traffic period on northbound US 101.

Southbound traffic congestion within the study limits typically occurs between 5:30 A.M. and 8:30 A.M. in Sonoma County, with queues backing up behind the South Petaluma Boulevard on-ramp to south of Old Redwood Highway; and between 6:30 A.M. and 9:30 A.M. in Marin County, with queues backing up in the three-lane freeway section south of the Lincoln Avenue on-ramp. Maximum vehicle delay from the first bottleneck is about nine minutes; maximum vehicle delay from the second bottleneck is about 16 minutes.

Northbound traffic congestion generally develops between 3:00 P.M. and 6:30 P.M., primarily in Marin County. The primary northbound P.M. peak period bottleneck currently develops north of the Atherton Avenue Interchange where the expressway section begins. The maximum vehicle delay from this bottleneck is about six minutes.

Intersection Operations

The 2000 Highway Capacity Manual defines the levels of service (LOS) for signalized intersections in terms of control delay, as illustrated in Table 3.1-10.

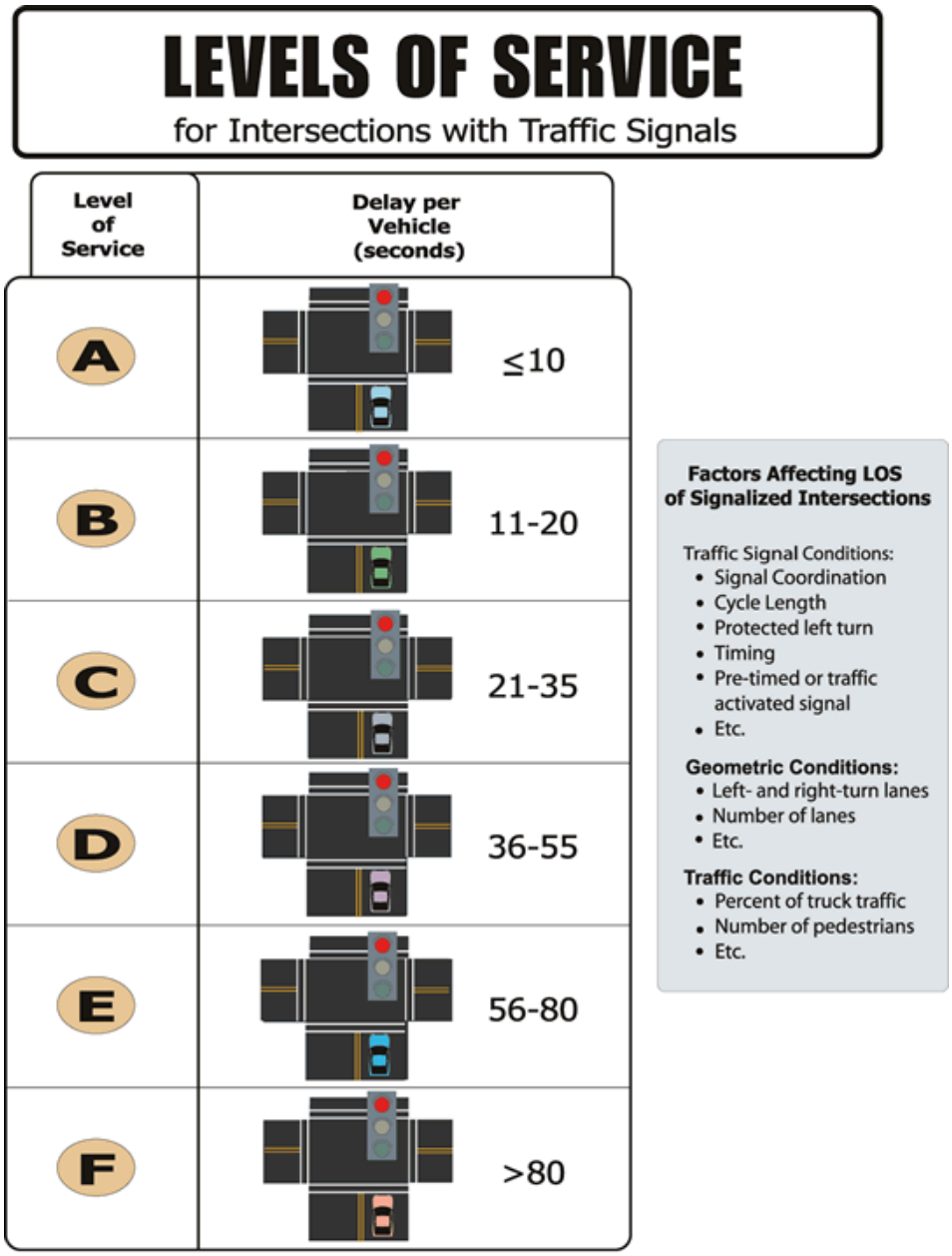
Caltrans analyzed levels of service at the US 101 southbound ramps/Atherton Avenue and northbound ramps/Atherton Avenue intersections based on 2002 A.M. and P.M. peak hour volumes. The analyses show that the intersection of the southbound ramps operates at LOS A, and the intersection of the northbound ramps operates at LOS C, in both the A.M. and P.M. peak hours.

It should be noted, however, that the operation of the southbound ramps/Atherton Avenue intersection is heavily influenced by operations at the adjacent Redwood Boulevard/Atherton Avenue intersection to the west. These intersections are only about 100 m apart and storage is limited to about 12 vehicles per lane per signal cycle. Poor operations occur at this intersection, and the westbound approach queues impact operations at the upstream southbound ramps/Atherton Avenue intersection. Caltrans' Office of Highway Operations field study confirmed that the westbound traffic at the Redwood Boulevard/Atherton Avenue intersection occasionally backs up to the southbound ramps/Atherton Avenue intersection and causes queuing on the US 101 southbound off-ramp in the morning peak period.

Ramp Metering

Ramp metering is currently limited in Marin and Sonoma Counties. In Sonoma County, the only ramps on US 101 wired for metering are south of SR 12 for approximately five miles. In Marin County, the Ignacio Boulevard ramps have partial equipment installed. Metering is currently not in operation in Marin or Sonoma Counties.

Table 3.1-10 Levels of Service



Source: 2000 HCM, Exhibit 16-2, Level of Service Criteria for Signalized Intersections

Pedestrian and Bicycle Facilities

Pedestrian and bicycle use is prohibited along the freeway portions of the project corridor within Segments A and C. Pedestrian and bicycle use is not prohibited along the expressway portion of the project corridor in Segment B.

As indicated in Figure 3.1-10, the expressway segment (Segment B) is not a designated bicycle route, and there are no pedestrian centers within Segment B. Therefore, the expressway shoulder does not qualify as a 4(f) resource under the Department of Transportation Act (49 U.S.C. 1966). Bicycle use in this area is moderate since there is no continuous route (access road or bikeway) between Novato and Petaluma. Pedestrian use is low due to the rural nature of the area. Existing access roads that allow for pedestrian and bicycle use include Redwood Boulevard between the Atherton Avenue/US 101 Interchange and the Birkenstock Warehouse west of the expressway, and Binford Road between the Atherton Avenue/US 101 Interchange and Airport Road east of the expressway.

Table 3.1-11 defines the Bikeway Classifications according to the Caltrans Highway Design Manual, and is provided as a reference for the following discussion of existing and proposed bicycle paths in the project corridor.

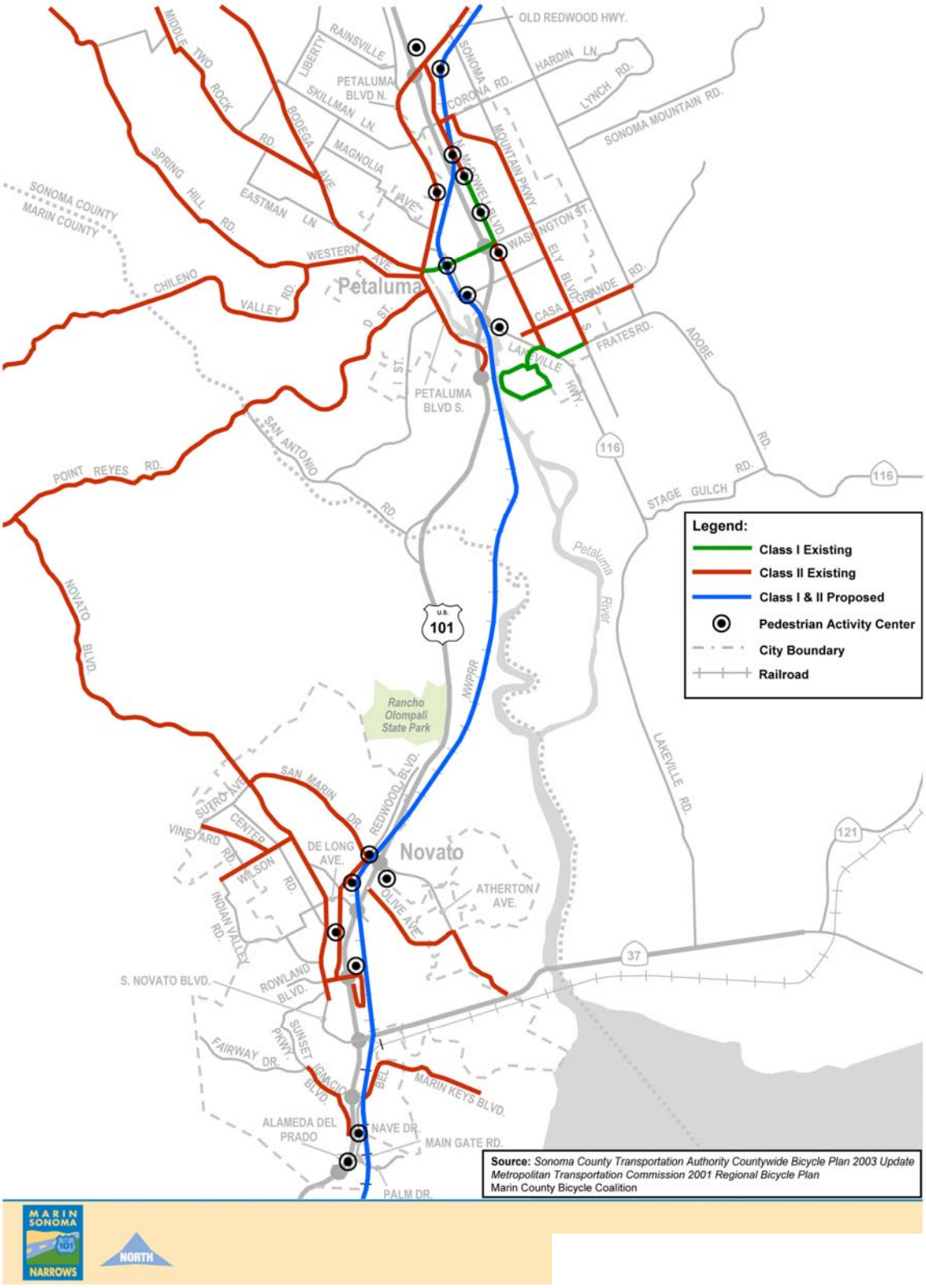
Table 3.1-11 Bikeway Classifications

Bikeway Class	Definition
Class 1 Bikeway (Bike Path)	Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flow minimized.
Class 2 Bikeway (Bike Lane)	Provides a striped lane for one-way bike travel on a street or highway.
Class 3 Bikeway (Bike Route)	Provides for shared use with pedestrian or motor vehicle traffic.
Source: Caltrans Highway Design Manual, July 1995.	

Marin County

The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan, completed in June 2000, is the primary coordination and planning document for bicycle facilities in Marin County. The existing bikeway system in Marin's unincorporated regions consists of an incomplete system of approximately 14 km (9 mi) of bikeways, including 6 km (4 mi) of multi-use pathways, 3 km (2 mi) of bicycle lanes, and 5 km (3 mi) of signed bicycle routes or other informal routes.

Figure 3.1-10 Pedestrian Activity Centers and Bicycle Routes



Sonoma County

The Sonoma County Transportation Authority Countywide Bicycle Plan Update (2003) contains the countywide plan for bicycle facilities in Sonoma County. The primary goals are to create a countywide non-motorized transportation system that would provide safe and efficient opportunities for bicyclists to access school, work, shopping centers, professional services, and transportation to recreation areas. Bicycle facilities may also serve as recreational paths themselves. Currently, there are over 53 km (33 mi) of off-road Class 1 bicycle paths and 103 km (64 mi) of on-street, or Class 2 bicycle lanes in Sonoma County.

City of Novato

In the City of Novato, an existing Class 2 bikeway runs along Novato Boulevard from just south of Rowland Boulevard to the Novato Boulevard/Point Reyes Road intersection. Another Class 2 bikeway follows Redwood Boulevard and San Marin Drive from Rowland Boulevard to the San Marin Drive/Novato Boulevard intersection. Class 2 bikeways also run along Olive Avenue, Ignacio Boulevard, Bel Marin Keys Boulevard, Wilson Avenue, and Vineyard Road. Proposed bikeway facilities in the Novato portion of the study area will include the North-South Greenway, a multi-use pathway that would parallel US 101 along the old Northwestern Pacific (NWP) railroad right-of-way (see the discussion of the SMART Rail Line, below).

City of Petaluma

In the City of Petaluma, an existing Class 1 and 2 bikeway crosses US 101 at East Washington Street, extending from North McDowell Boulevard to Petaluma Boulevard. East of the highway, another existing bikeway runs along North McDowell Boulevard from south of Casa Grande Road to Redwood Road. Class 2 bikeways include the Casa Grande Road bikeway from Lakeville Highway/SR 116 to Adobe Road and the Ely Boulevard/Sonoma Mountain Parkway bikeway, which extends from Frates Road to Corona Road. West of the highway, several Class 2 bikeways extend from downtown Petaluma to points west, along Bodega Avenue, Middle Two Rock Road, Western Avenue, Chileno Valley Road, and Point Reyes Road. Proposed bicycle facilities in the Petaluma portion of the study area include a Class 1 and 2 bikeway that would follow the route of the old NWP Railway right-of-way (see the discussion of the SMART Rail Line, below).

Sonoma Marin Area Rail Transit (SMART) Rail Line

Although not a state facility, the old NWP Railroad line parallels US 101, and at one time connected Larkspur and Eureka. This rail line, which has not been in service since November 1998, is currently owned by the Sonoma Marin Area Rail Transit (SMART) District, which was created in January 2003. SMART's enabling legislation directed the District to repair the route to return it to freight and commuter/transit use (at least initially between San Rafael and Cloverdale). A pathway for use by bicyclists and pedestrians is being considered. As noted in Section 3.1.9, the SMART passes under the US 101 at four locations within the project boundaries.

Navigation

Petaluma River Bridge No. 20-0154 L&R was built in 1955. The bridges were seismic retrofitted in 1996. In 2001, the barrier rails were upgraded. According to the latest bridge inspection report dated 09/01/2006, the bridges appear to be in good condition. An underwater investigation was completed on 03/24/2004 and no significant defects were observed.

The Petaluma River is a navigable waterway for bridge permitting purposes. The location and clearances of proposed bridges are permitted by the Coast Guard, under the provisions of the General Bridge Act of 1946, as amended. The size and type of vessels operated in the Petaluma River, through the proposed bridge site, have increased to the point that the existing US 101 bridge has become the limiting vertical clearance and the adjacent Haystack Landing Railroad drawbridge has become the limiting horizontal clearance. Historically, the largest vessels on the waterway have been commercial, consisting of tugs pushing barges, approximately 55 ft wide, 300 ft long, and requiring a vertical clearance of 70 ft above the waterline to ensure safe navigation. The existing Petaluma River Bridge provides 30.48 m (100 ft) of horizontal clearance measured between the existing bridge fenders. The existing, to be replaced bridge, minimum vertical clearance, was measured at 21.52 m (70.6 ft) above mean high water at the time of its completion.

The proposed replacement bridge will not reduce the existing navigational opening on the Petaluma River. The US Coast Guard will determine acceptable clearance, such that current and future navigation is not impaired by the structure. Clearance will be stated in the US Coast Guard Bridge Permit.

The Petaluma River, at the proposed bridge site, has an approximate width of 200 feet and is located at a bend in the river, located approximately 404 feet from the Haystack Landing Drawbridge.

3.1.10.3 Impacts

Introduction

Caltrans conducted an analysis of US 101 operations to compare the potential traffic impacts of the two Build Alternatives with the No Build Alternative over the next 20 years. For this comparison, Caltrans developed the following six scenarios:

1. Year 2010 No Build Alternative;
2. Year 2030 No Build Alternative;
3. Year 2010 Fixed HOV Lane Alternative;
4. Year 2030 Fixed HOV Lane Alternative;
5. Year 2010 Reversible HOV Lane Alternative; and
6. Year 2030 Reversible HOV Lane Alternative.

The study area included the freeway mainline from the Miller Creek Interchange in Marin County to the Old Redwood Highway Interchange in Sonoma County with on-ramps and off-ramps.

The Marin/Sonoma Model that Caltrans used for the study is based on land use assumptions from the 1998 base year and 2020 future year trip tables, using ABAG's Projections 2000 land use data. The 397-zone Marin/Sonoma Model was developed with the assistance of Marin County and Fehr and Peers Associates for the Sonoma Land Use Study Project and was adapted from the Marin County Congestion Management Agency 293-zone model.

The year 2010 and 2030 trip tables were developed by modifying the year 2020 trip tables. Appropriate factors to modify the 2020 trip tables were calculated based on ABAG's Projections 2002 at the county-to-county level.

ABAG Projections 2005, which was not available at the time the highway operational analysis was conducted, predict slightly lower employment and population in Sonoma County than the ABAG Projections 2002. The 2010 and 2030 trip tables used for this highway operational analysis are therefore somewhat conservative and very similar to those that would have resulted from the use of ABAG Projections 2005 for the factors used to adjust the year 2020 trip tables.

As a general guideline, the year 2010 No Build roadway network reflects existing conditions, plus projects listed in the most recent (2001) RTP with committed funding status, and projects listed in the 2001 Transportation Implementation Plan (TIP). The following projects may impact traffic flow in the study area.

- US 101 widening from Wilfred Avenue to SR 12;
- US 101 widening from SR 12 to Steele Lane;
- Wilfred Avenue Interchange modification and US 101 widening from Wilfred Avenue to Rohnert Park Expressway; and
- US 101 HOV Gap Closure Project from Corte Madera to San Rafael.

The 2030 No Build roadway network is built from the year 2010 network by adding the 2001 RTP Track 1 Projects. These projects may also impact traffic flow in the study area and include:

- US 101 HOV widening from Old Redwood Highway in Petaluma to Rohnert Park Expressway in Rohnert Park; and
- US 101 HOV widening from Steele Lane to River Road in Santa Rosa.

The analysis assumed that HOV lanes in the US 101 corridor in Marin and Sonoma Counties would operate in both the A.M. and P.M. peak hours for both southbound and northbound directions.

Mainline Operations

Unlike other sections in this FEIR/S that separate the analysis of the Fixed and Reversible HOV Lane Alternatives, this discussion of traffic operations presents a comparative assessment to highlight the critical differences among the Build and No Build Alternatives.

Expected traffic conditions during the southbound A.M. peak period, the southbound P.M. peak period, the northbound A.M. peak period, and the northbound P.M. peak period are depicted in Figures 3.1-11 through 3.1-14, respectively, for the above-described six scenarios.

As shown in the figures, queues would be minimized in the study area with implementation of both the Fixed HOV Lane Alternative and the Reversible HOV Lane Alternative. Southbound A.M. peak period queues projected to occur in Segment B under the No Build Alternative would be eliminated. However, the

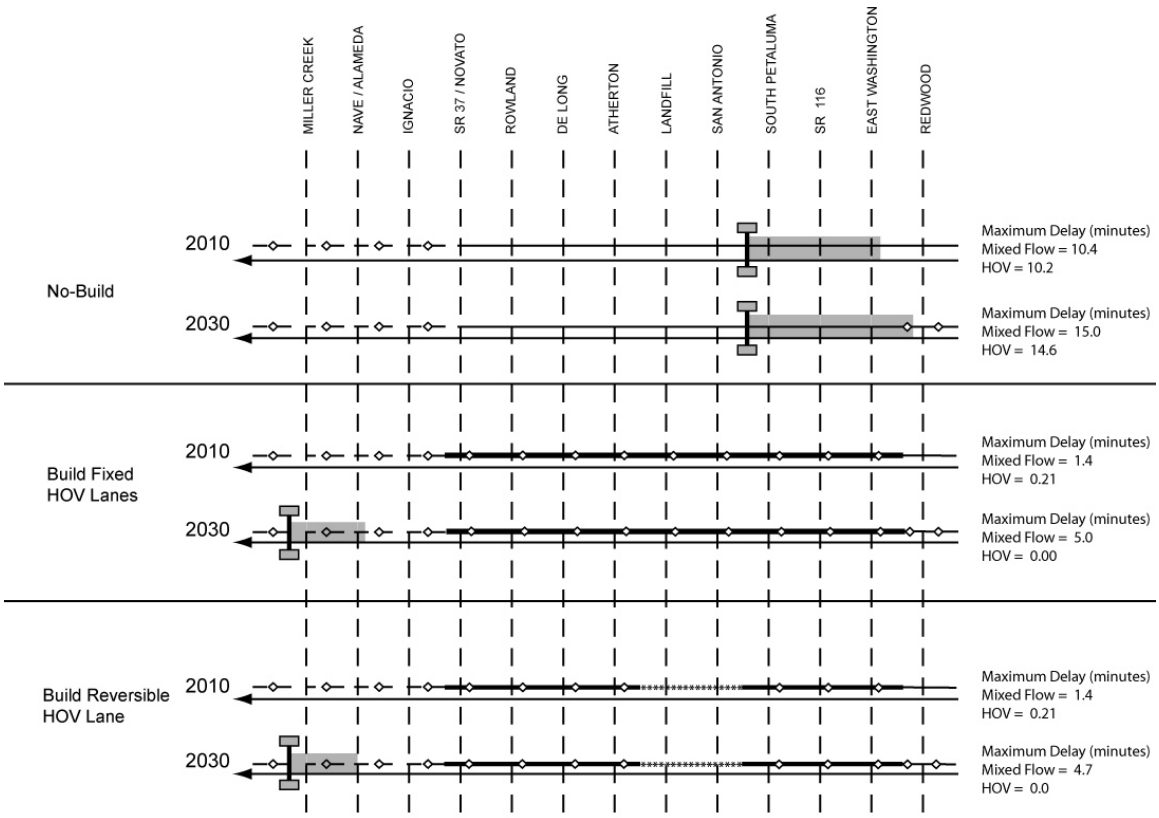
Reversible HOV Lane Alternative would result in bottleneck queues in Segment C during the southbound P.M. peak period, because this alternative would not provide a southbound HOV lane through Segment B. The lane configuration of southbound US 101 in Segment B under the Reversible HOV Lane Alternative would be similar to the lane configuration under the No Build Alternative.

Southbound Bottlenecks and Queues. As shown in Figure 3.1-11, a new queue would appear between Miller Creek and Nave Drive (south of the project limits) in the southbound direction during the A.M. peak period with implementation of either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative. However, this queue would not develop under the No Build Alternative. The queues shown under the No Build Alternative in Figure 3.1-11 indicate that, if traffic growth occurs as projected, the existing southbound bottleneck at the South Petaluma Boulevard on-ramp in Sonoma County would continue to develop and result in congestion up to East Washington Interchange by 2010. Additional traffic growth projected to 2030 would extend congestion further north to Old Redwood Highway. Although the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative would add enough capacity to eliminate the bottleneck at South Petaluma Boulevard, traffic that was queued before, combined with higher projected 2030 traffic, would result in a new bottleneck developing south of Miller Creek and outside of the project limits. This new bottleneck would result in the queues depicted in Figure 3.1-12.

Northbound Bottlenecks and Queues. As shown in Figure 3.1-13, a new queue would develop along northbound US 101 at Atherton Avenue during the A.M. peak period with implementation of the Reversible HOV Lane Alternative. This queue would develop because the reversible lane would be in operation in the southbound direction, which is where the greater demand would be during the A.M. peak period. However, there would not be enough capacity in the northbound direction during that period to eliminate the bottleneck and queue near Atherton Avenue. This bottleneck would not occur under the Fixed HOV Lane Alternative, because this alternative would include a northbound HOV lane.

As shown in Figure 3.1-14, during the P.M. peak period, the queues depicted in the vicinity of the Miller Creek and Nave/Alameda interchanges would remain with implementation of either of the two Build Alternatives. These queues result from a northward bottleneck between the Nave on ramp and the Ignacio off-ramp during the P.M. peak period. The bottleneck and subsequent queues have no

Figure 3.1-11 Southbound A.M. Peak Period—Expected Traffic Conditions



Note: In Figures 3.1-11 through 3.1-14, the Reversible HOV Lane Alternative would provide an HOV lane in only one direction (southbound operation during A.M. peak hour and northbound operation during P.M. peak hour).

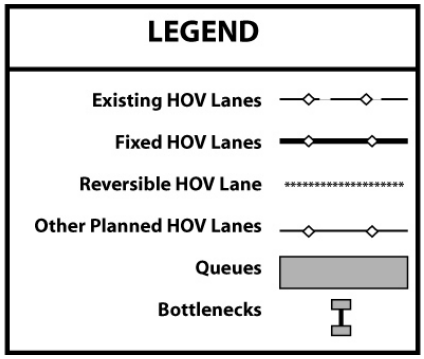
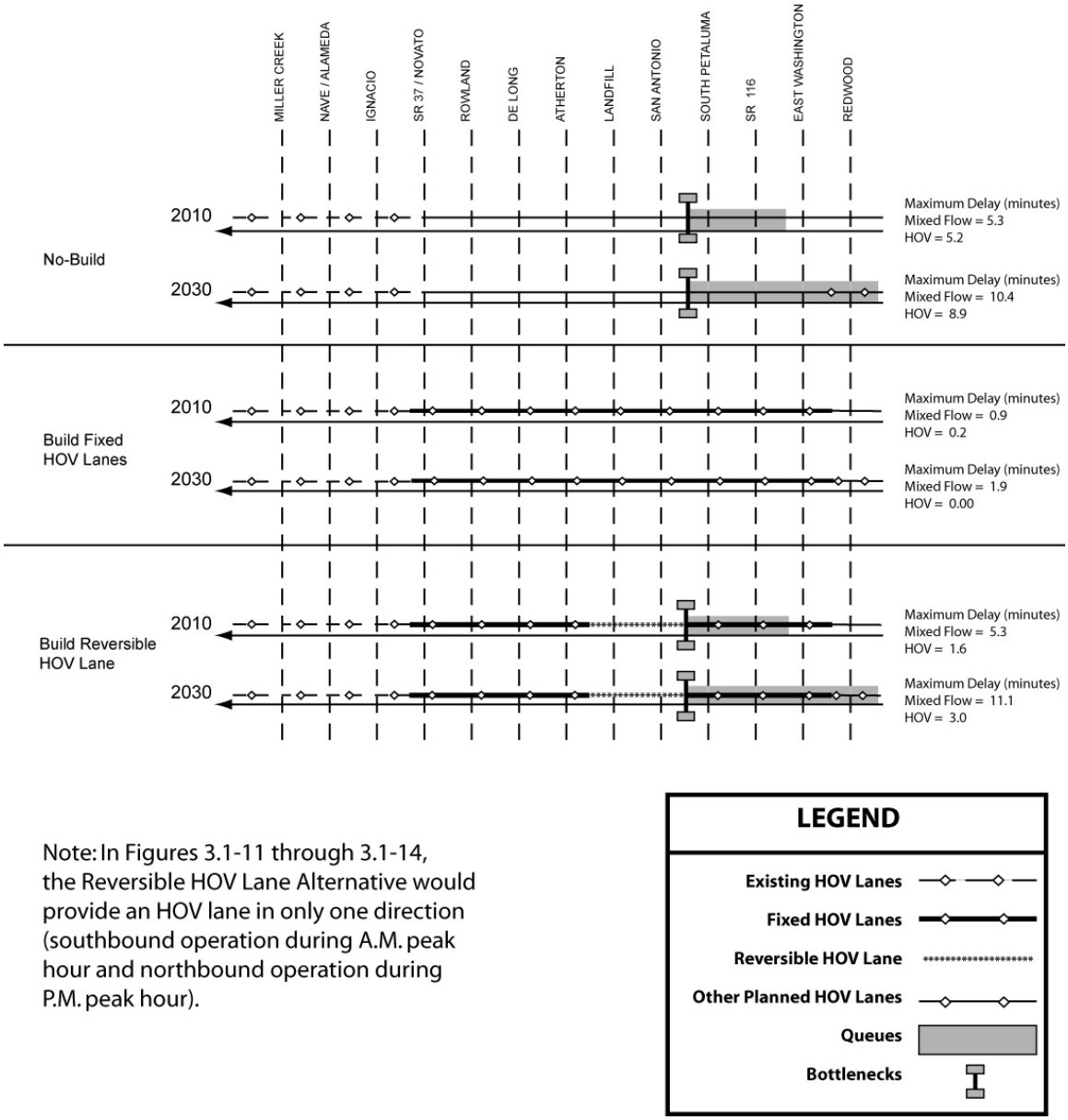
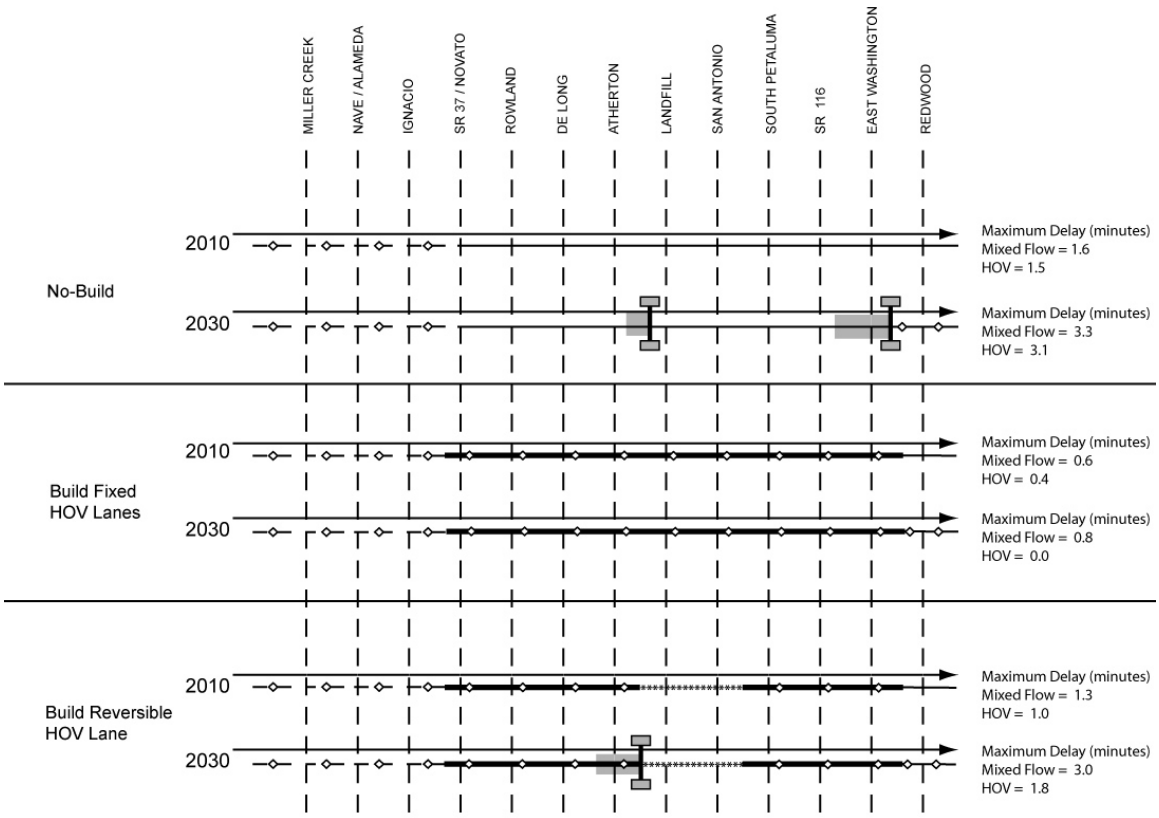


Figure 3.1-12 Southbound P.M. Peak Period—Expected Traffic Conditions



Note: In Figures 3.1-11 through 3.1-14, the Reversible HOV Lane Alternative would provide an HOV lane in only one direction (southbound operation during A.M. peak hour and northbound operation during P.M. peak hour).

Figure 3.1-13 Northbound A.M. Peak Period—Expected Traffic Conditions



Note: In Figures 3.1-11 through 3.1-14, the Reversible HOV Lane Alternative would provide an HOV lane in only one direction (southbound operation during A.M. peak hour and northbound operation during P.M. peak hour).

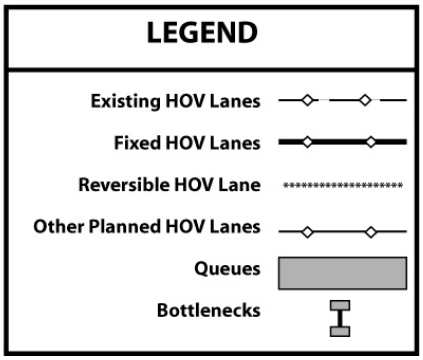
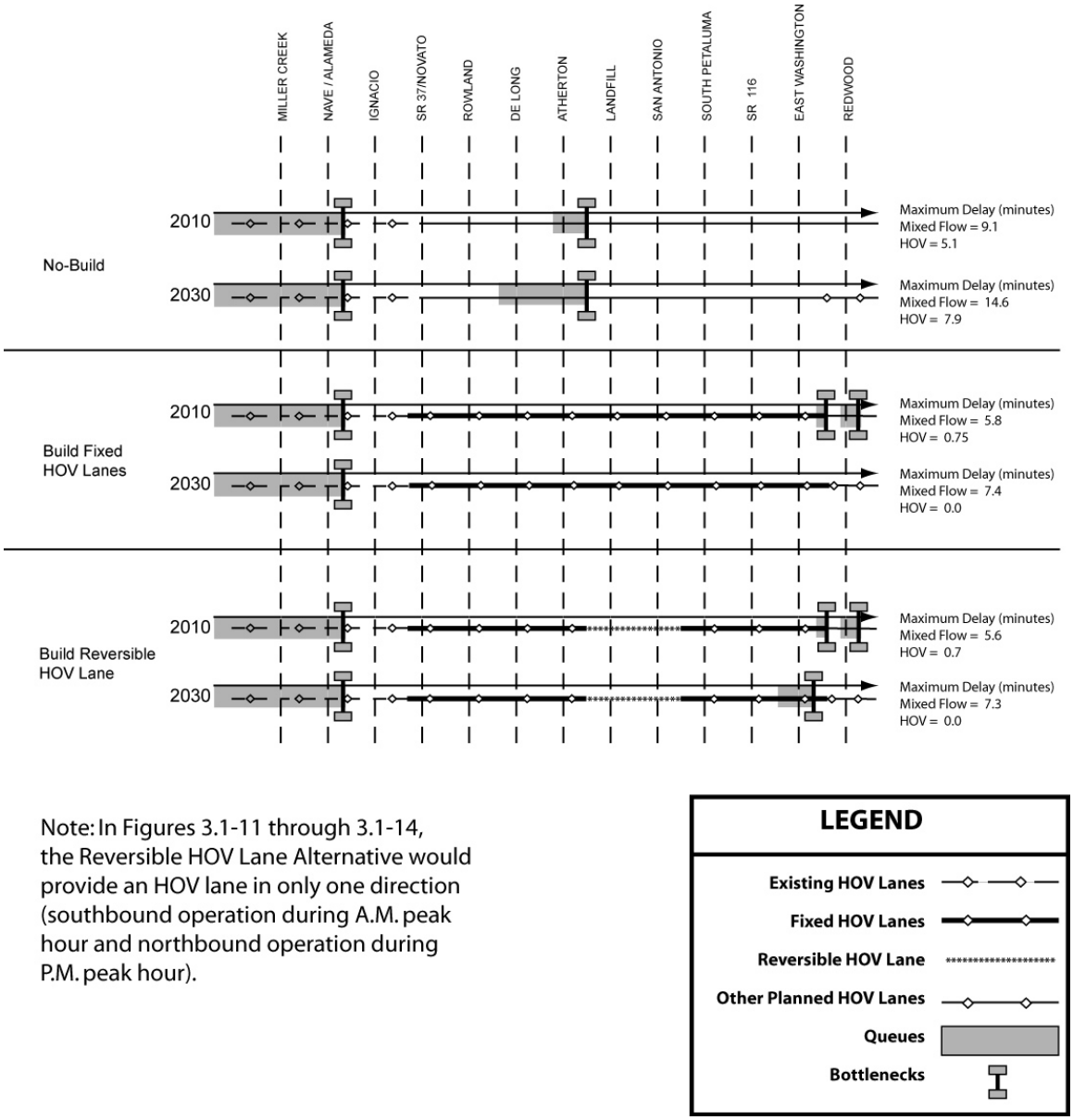


Figure 3.1-14 Northbound P.M. Peak Period—Expected Traffic Conditions



Note: In Figures 3.1-11 through 3.1-14, the Reversible HOV Lane Alternative would provide an HOV lane in only one direction (southbound operation during A.M. peak hour and northbound operation during P.M. peak hour).

causal connection to the MSN Project, as it appears under all the alternatives in 2010 and 2030. There is a project listed in MTC's Transportation 2030 Plan, called US 101 northbound speed change lane at Nave Drive; however, this project is not yet at the Project Initiation Document stage, and there is no traffic study to indicate whether this would remedy the bottleneck in this location.

Vehicle Delay. Another measure of traffic flow and congestion is an estimate of the amount of delay experienced by motorists, compared to free-flow conditions on the freeway. Tables 3.1-12 and 3.1-13 summarize vehicle delay within the study limits for the above-described six scenarios for both the A.M. and the P.M. peak periods. As shown, implementation of either of the two Build Alternatives would result in a reduction in vehicle delay in both the A.M. and P.M. peak periods for both SOVs that would continue to travel in mixed flow lanes and HOVs when compared with the No Build Alternative. Implementation of the Fixed HOV Lane Alternative would result in the least amount of overall vehicle delay for HOVs. In other words, motorists traveling in the HOV lanes under this alternative would experience the greatest time savings in their trips.

Table 3.1-12 Maximum Southbound Vehicle Delays (minutes)

Alternatives	Occupancy	Year 2010		Year 2030	
		A.M.	P.M.	A.M.	P.M.
No Build	Mixed Flow (SOV)	10.4	5.3	15.0	10.4
	HOV Traffic (2+)	10.2	5.2	14.6	8.9
Fixed HOV Lane	Mixed Flow (SOV)	1.4	0.9	5.0	1.9
	HOV Traffic (2+)	0.2	0.2	0.0	0.0
Reversible HOV Lane	Mixed Flow (SOV)	1.4	5.3	4.7	11.1
	HOV Traffic (2+)	0.2	1.6	0.0	3.0

Table 3.1-13 Maximum Northbound Vehicle Delays (minutes)

Alternatives	Occupancy	Year 2010		Year 2030	
		A.M.	P.M.	A.M.	P.M.
No Build	Mixed Flow (SOV)	1.6	9.1	3.3	14.5
	HOV Traffic (2+)	1.5	5.1	3.1	7.9
Fixed HOV Lane	Mixed Flow (SOV)	0.6	5.8	0.8	7.4
	HOV Traffic (2+)	0.4	0.8	0.0	0.0
Reversible HOV Lane	Mixed Flow (SOV)	1.3	5.6	3.0	7.3
	HOV Traffic (2+)	1.0	0.7	1.8	0.0

It should be noted that completion of the US 101 HOV Lane Project from Old Redwood Highway to Rohnert Park Expressway in Santa Rosa assumed under

2030 conditions would reduce vehicle delay for HOVs when compared with 2010 conditions. This reduction in delay is reflected in the tables.

Table 3.1-14 shows the travel time savings HOV lane users would experience compared with vehicles in the mixed-flow lanes with implementation of either of the two Build Alternatives. As shown, implementation of either of the Build Alternatives would result in peak direction time savings for HOVs of one to five minutes in 2010 and five to seven minutes in 2030. The greater time savings in 2030 is a result of the implementation of the US 101 HOV widening project from Old Redwood Highway to Rohnert Park Expressway in Santa Rosa assumed in the No Build Alternative.

Table 3.1-14 Expected HOV Travel Time Savings (Minutes)

Alternatives and Direction	Year 2010		Year 2030	
	A.M.	P.M.	A.M.	P.M.
Fixed HOV Lane				
Southbound	1.2	0.7	5.0	1.9
Northbound	0.2	5.0	0.8	7.4
Reversible HOV Lane				
Southbound	1.2	3.8	4.7	8.1
Northbound	0.3	4.9	1.2	7.3

Vehicle Miles Traveled (VMT). Table 3.1-15 has been corrected since the DEIR/S; however, the current findings are the same as those reported in October 2007. There is a nominal increase in VMT between the No Build and Build Alternatives which suggests that the reduced congestion on US 101 would attract additional travelers.

Table 3.1-15 Projected Increase in Vehicle Miles Traveled Countywide (in thousands of miles), Year 2030

Alternatives	Project Area		Marin County and Sonoma County	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
No Build	5,312	6,358	16,614	20,133
Build Alternatives	5,318	6,367	16,625	20,154
Difference	6	9	11	21
Percent Increase	0.11%	0.14%	0.07%	0.10%

Replacement Access (Segment B Access Options)

Access Options. Access to US 101 for adjacent property owners throughout Segment B would be provided to via proposed access roads. The specific

locations of the access points will be determined during the design phase based upon Access Option 12b, as part of the Preferred Alternative. Based on 12b, access point locations will be developed with input from the individual property owners affected by the project.

Each of the Access Options was evaluated on how well it replaces access to three major areas, Redwood Landfill, San Antonio Creek, and Cloud Lane/Kastania Road. The rating scheme considered both "main" access serving major or heavier traffic movements and "local" access serving individual properties. Main access at Redwood Landfill, for example, covers the traffic movements to and from the landfill, the marina, and Gnoss Airport. In the rating scheme, the ability of an Access Option to provide main access was weighted more heavily to reflect the higher traffic volumes and thus the higher number of motorists served. A more detailed description of the evaluation methodology is provided in Appendix A of this FEIR/S.

Access Option 4b, which includes interchanges at Redwood Landfill and at the San Antonio Overcrossing, was the most highly rated scenario, providing excellent access for the heavier traffic movements around the Redwood Landfill and San Antonio Creek. The other Access Options were scored lower. The overall access ratings for Access Options 12b, 14b, and 14d were identical, but the ratings to individual areas vary. Option 12b, which includes an interchange at Redwood Landfill and no overcrossing at San Antonio Road, was rated excellent for major traffic movements around the Redwood Landfill, good for main access around San Antonio Creek, and poor for local access to the uses around San Antonio Creek. By contrast, Access Options 14b and 14d, which do not include an interchange at Redwood Landfill but do include an interchange at San Antonio Road, rated poor in terms of serving the heavier traffic volumes around Redwood Landfill, but excellent in terms of serving land uses around San Antonio Creek. All four of the Access Options provide good local access to residents and businesses around Cloud Lane and Kastania Road.

In summary, the distinguishing features among the Access Options are the ability to replace access for heavier traffic movements around Redwood Landfill and main and local access around San Antonio Creek:

- For Redwood Landfill, Access Options 4b and 12b rate higher than Access Options 14b and 14d.

- For San Antonio Creek, Access Options 4b, 14b, and 14d rate higher than Access Option 12b.

No Build Alternative. The No Build Alternative would not involve transportation changes in Segment B. Therefore, there would be no need for replacement access and no change to traffic and circulation conditions for main and local access.

Intersection Operations

Traffic conditions were analyzed at the US 101 southbound ramps/Atherton Avenue and northbound ramps/Atherton Avenue intersections for the years 2010 and 2030. The intersection LOS for all three alternatives is shown in Table 3.1-16. As previously stated in Section 3.1.10, the operation of the southbound ramps/Atherton Avenue intersection is influenced by the operation of the Redwood Boulevard/Atherton Avenue intersection to the west. A westbound storage length of 100 m is inadequate to accommodate future A.M. peak hour traffic if poor operations occur at this intersection. Consequently, the westbound approach queue would cause operations to deteriorate at the upstream southbound ramps/Atherton Avenue intersection.

Table 3.1-16 US 101 Levels of Service at Intersections: Southbound Ramps/Atherton Avenue and Northbound Ramps/Atherton Avenue

Alternatives	Year 2010		Year 2030	
	A.M.	P.M.	A.M.	P.M.
Southbound				
No Build	B	A	B	A
Fixed HOV Lane	B	A	B	A
Reversible HOV Lane	B	A	B	B
Northbound				
No Build	B	C	C	D
Fixed HOV Lane	B	C	C	D
Reversible HOV Lane	B	C	C	D

Construction of Roadway

Fixed HOV Lane Alternative. Due to the high-traffic volumes and existing delays, any construction activity on US 101 requires that staged construction be considered to minimize impacts to the traveling public. Preliminary Staged Construction designs have been completed for all major elements of the proposed MSN Project. Through a multi-stage approach, the existing number of lanes would be maintained throughout construction.

The median widening, primarily in Segments A and C, would be performed in three stages. Stages 1 and 2 would widen a 1.7 to 3.6 m (6 to 12 ft) strip adjacent to the existing number 1 lane (the lane adjacent to the median). This work may be done at night and on weekends using lane closures. At the end of each stage, k-rail would be placed to provide a minimum 0.6 m (2 ft) shoulder. Stage 3 would complete the median widening.

Significant portions of the roadway in Segment B would be reconstructed. Some of this work can be constructed in two stages. Alignments have been developed to allow building portions of the roadway on either side of the existing roadway. One direction of traffic would then be shifted onto the newly build roadway. Other portions of the reconstruction, where the existing alignment is being maintained, would require a three stage construction. The median would be constructed during the first stage then used alternately for each direction of traffic while that side is being reconstructed.

Work along the outside shoulder through portions of Segment A would be needed for soundwall construction. This work would be done behind k-rail with shoulder closures after the median widening is completed. Outside widening is also required in Segment C. This work would be done behind k-rail with traffic shifted to the median to provide an outside shoulder.

At this time, it is anticipated that the majority of mainline work can be carried out during typical 8-10 hour work shifts; no 24-hour lane closures are expected. Most access and circulation impacts as a result of street closures and detours would be temporary and construction related. Construction impacts may cause additional traffic delays during peak and off-peak periods. During construction, roadway capacities would be maintained similar to existing conditions, therefore, construction related delays would be minimized.

Reversible HOV Lane Alternative. In Segments A and C, the improvements and scope of work would be identical for the Reversible HOV Lane Alternative and the Fixed HOV Lane Alternative. As a result, the same construction-related impacts of additional delays during peak and off-peak periods described for the Fixed HOV Lane Alternative, above, would apply to the Reversible HOV Lane Alternative.

Access Options. The Access Options proposed for Segment B involve various combinations of interchanges, access roads, and bicycle/pedestrian facilities.

Construction-related access impacts would occur where properties are currently accessed either directly from the mainline or from local roads. Closure of some portions of access roads and/or temporary traffic control measures may be required.

No Build Alternative. The No Build Alternative would involve only maintenance and upkeep of the existing US 101 facilities. No new significant construction would be expected. During rehabilitation, additional delays during peak and off-peak would be expected, as described for the Build Alternatives, although for a shorter duration under the No Build Alternative.

Pedestrian and Bicycle Facilities

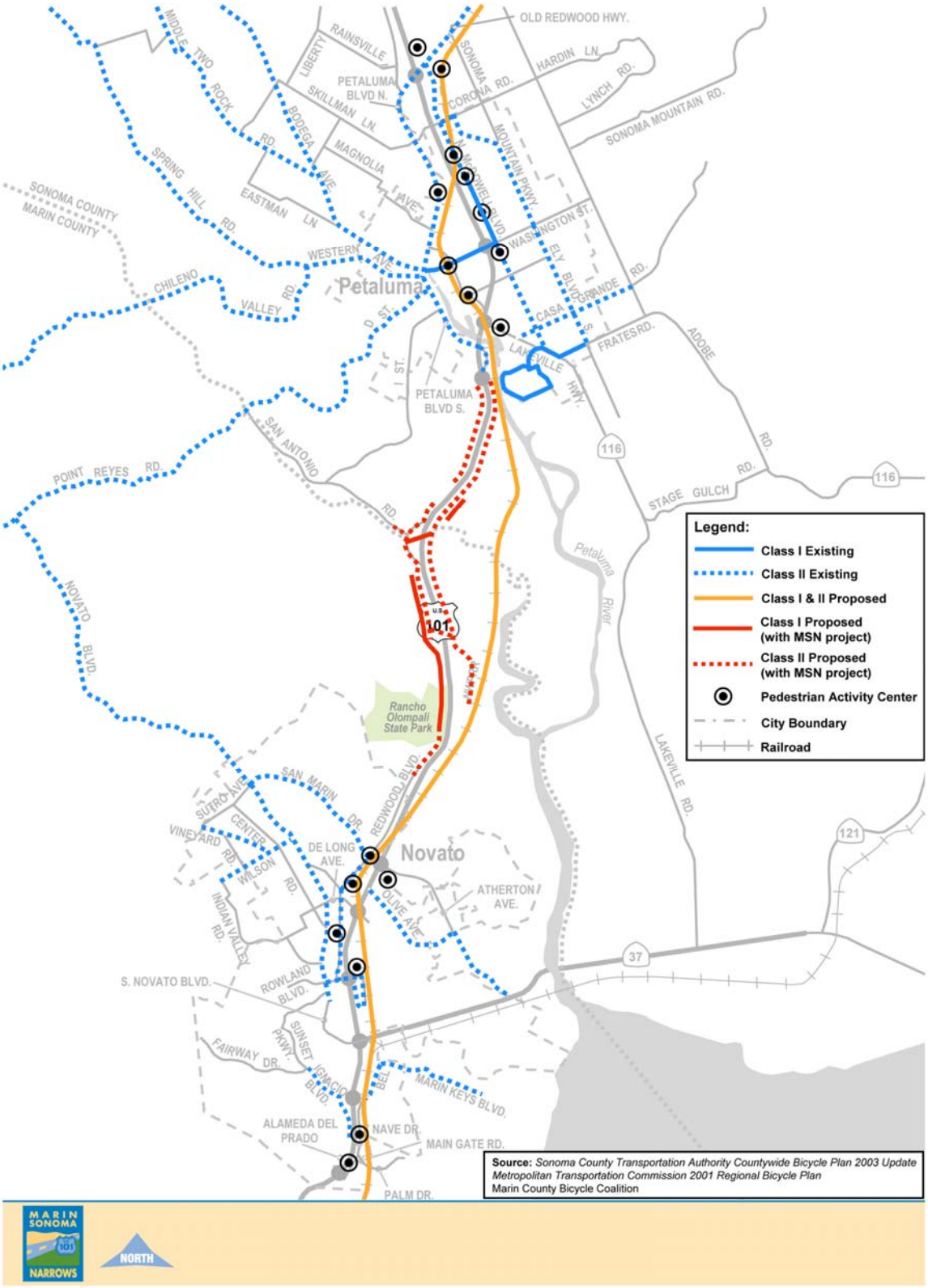
Fixed HOV Lane Alternative. During stakeholder meetings, the bicycle/pedestrian community expressed the importance of being able to access Olompali SHP and San Antonio Road from either the east or west side of US 101, as well as the importance of accessing the SMART corridor that is being proposed as part of the commuter rail proposal. The bicycle/pedestrian paths proposed under the Fixed HOV Lane Alternative would provide these connections.

Under the Fixed HOV Lane Alternative, bicycle/pedestrian paths would be provided throughout the new freeway segment as part of the Access Options (see description, below) to replace existing bicycle access along the expressway shoulder. The construction of access roads within Segment B would also allow construction of a combination of Class 1 and Class 2 bicycle paths between the cities of Novato and Petaluma. Figure 3.1-15 shows the bicycle/pedestrian routes that would be constructed under the Fixed HOV Lane Alternative along with existing and proposed routes in Novato and Petaluma.

In light of the proposals to construct new bicycle/pedestrian facilities that connect desired destinations and other planned or existing paths, the Fixed HOV Lane Alternative would have beneficial effects on bicycle/pedestrian circulation.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would include the same bicycle/pedestrian improvements as the Fixed HOV Lane Alternative (see description of Access Options, below). Accordingly, the Reversible HOV Lane Alternative would have beneficial effects on bicycle/pedestrian circulation.

Figure 3.1-15 Bike/Pedestrian Routes under the Build Alternatives



Access Options. Pedestrian and bicycle paths would be constructed as part of the local road network proposed under each of the Access Options. In general, Class 2 bicycle/pedestrian paths would be provided on access road shoulders and Class 1 bicycle/pedestrian paths would be provided from the terminus of access roads to the next overcrossing. As noted above under the Build Alternatives, the construction of new bicycle/pedestrian facilities that connect desired destinations and other planned or existing paths in Segment B, where none officially exist currently, would be a beneficial effect. Descriptions of the key bicycle/pedestrian facilities under the various Access Options are provided below.

Under all of the Access Options, a Class 2 bicycle/pedestrian path would proceed northward from the Atherton Interchange along a repaved Redwood Boulevard on the west side of US 101.

Under Access Option 4b, a Class 1 bicycle/pedestrian path would be constructed on the west side of US 101 from the Olompali SHP entrance northward past Silveira Dairy (see Figure 3.1-45) and past the proposed South San Antonio Road Overcrossing. From this point, a Class 2 bicycle path would begin northward along a repaved San Antonio Road and over a new bridge just west of the historic San Antonio Bridge, which would be left in place and used for bicyclists and pedestrians (see Figures 3.1-28 and 3.1-29).

Also, under Access Options 4b and 12b, a Class 2 bicycle/pedestrian path would be provided on the west side of US 101 from Cloud Lane, extending northward over Kastania Road and continuing to South Petaluma Boulevard. From this point, the SMART rail corridor would be accessible under all the Access Options.

Under all the Access Options, a Class 1 bicycle/pedestrian path would be constructed between San Antonio Road on the west side of US 101 to the east side of US 101 along San Antonio Creek. A visual simulation of this path is shown in Figure 3.1-38. This bicycle/pedestrian path would become a Class 2 facility along San Antonio Road, as shown in Figure 3.1-38.

Under Access Option 14d, a Class 2 bicycle/pedestrian path would extend from the Redwood Landfill Overcrossing to the San Antonio Overcrossing on the west side of US 101 past Silveira Dairy. Under Access Option 4b, this path is a Class 1 facility and is depicted in Figure 3.1-47. These and other portions of the bicycle/pedestrian networks proposed under Access Options 4b, 12b, 14b, and 14d are shown in Volume 2 of the FEIR/S.

A Class 1 bicycle/pedestrian facility through Segment B within the existing project footprint will be considered during the final design stage if it is determined to be feasible. Although conceptual plans have not been prepared, impacts of a Class 1 facility would be comparable to or less than the impacts discussed in this FEIR/S.

No Build Alternative. There would be no change to the existing bicycle access in the project corridor under the No Build Alternative. Under the No Build Alternative, there would be no impacts to pedestrian or bicycle lanes within Segments A or C.

Under the No Build Alternative, Class 2 bicycle access through Segment B would continue along the expressway shoulder. However, bicyclists and pedestrians would continue using Atherton in Novato or South Petaluma Boulevard to reach destination centers such as Olompali SHP or San Antonio Road. Furthermore, if the SMART bicycle/pedestrian trail becomes operational, bicyclists and pedestrians on the west side of US 101 would not be able to access it along the Segment B due to lack of public overcrossings under the No Build Alternative.

Navigation

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would add an additional lane in both directions on US 101. Due to the age of the Petaluma River Bridge structures and the need to improve the vertical profile of the roadway alignment to current standards in this location, it is proposed to replace these two structures with one single structure.

The existing structures need to be widened to accommodate an additional 3.6 m (12 ft) lane and 3.0 m (10 ft) inside and outside shoulders. There is an existing fender system protecting the bridge bents at each side of the waterway. This fender system will be removed during construction in order to facilitate bridge construction work. The new bridge will meet current and future navigational needs through the waterway. The new Pier 3 will likely be located away from the waterway limit. A new bridge fender system or a closed fill system will likely be required for Pier 4. Two structure alternatives are proposed for the replacement bridge. Both alternatives would construct a 260.5 m (855 ft) long and 35.110 m (115 ft) wide, five-span bridge. Alternative 1 would consist of a reinforced concrete box girder superstructure. Alternative 2 would consist of a Precast/Prestressed Concrete Bulb "T" girder superstructure (see Figures 3.1-39

and 3.1-40 for a visual simulation of the proposed bridge). The substructure for both alternatives consists of reinforced concrete column piers supported on spread footings or on pile caps with cast-in-drilled hole (CIDH) or cast-in-steel shell (CISS) pilings. Both alternatives proposed between three to five columns per pier for a total of between twelve to twenty columns for the four piers. The size of the individual column footing is approximately 10.67 m (35 ft) x 8.5 m (28 ft) x 2.0 m (7 ft) deep. It is anticipated that each column footing will consist of twenty-five to forty 457 mm (18-inch) to 762 mm (30-inch) diameter CIDH or CISS pilings for each of the twelve to twenty columns. No alterations to hydraulic patterns are expected.

Petaluma River Bridge Construction

The bridge will be constructed in three stages. In Stage 1, the middle portion of the proposed replacement bridge will be built in-between the two existing structures. The existing median barriers will be removed in Stage 1. In Stage 2, the existing southbound structure will be removed for the replacement bridge construction. In stage 3, the northbound structure will be removed to allow for the construction of the final portion of the replacement bridge.

The contractor will access the north bank of the river from SR 116 along the east side of US 101. The contractor will access the south bank of the river from South Petaluma Boulevard. Piers 2 and 5 are located above the banks of the Petaluma River. Pier 3 is located on land at the edge of the north bank the river. Pier 4 is located in the river, adjacent to the south bank. It is anticipated that the contractor will need to construct a temporary trestle to gain access to Pier 4 and to gain access to the south side of Pier 3. The contractor will drive temporary piles in the river and place a temporary timber deck on the pilings to create a work platform (trestle) above the river. A temporary cofferdam consisting of sheet pilings will then be installed around the perimeter of Piers 3 and 4. It is anticipated that one large cofferdam, approximately 45.72 m (150 ft) x 11.58 m (38 ft) will be installed per pier location.

Temporary cofferdams may also be used at Piers 2 and 5, if ground water is anticipated. Four additional cofferdams approximately 12 m (39 ft) x 7 m (22 ft) may be used for demolition of the exiting column footings in the river. Cofferdams will be constructed of interlocking sheet pilings, which will be driven by a vibratory hammer. If difficult driving is encountered, an impact hammer may be used for the final few feet of installation.

In order to facilitate the construction of the proposed replacement bridge, temporary falsework may be required. The falsework is used to support construction loads such as bar reinforcing steel, wet concrete and live loads (construction crew, equipment, etc.). The falsework bents may be constructed using steel or timber posts supported on timber pads placed on top of existing ground or piles driven into ground depending on the bearing capacity of the soil. To gain access to falsework and/or temporary erection towers locations in the river, the contractor will extend the north and south temporary trestles towards the center of the river.

After the completion of Stage 1 and Stage 2 proposed replacement bridge construction, the existing northbound and southbound bridges will be removed. For the portion of the structure over the waterway, the structure can be removed by saw cutting between precast concrete girders and then using crane(s) to lift the girders out of place. Subject to the engineer's approval, the crane(s) can be located at the adjacent spans of the bridge or barge cranes can be utilized to remove the girders. Bridge removal protective cover, if necessary, can be attached to the existing bridge soffit/bents. Temporary cofferdams will be required for the removal of the existing columns and/or spread footings at Pier 5 and Pier 6, made accessible by using the temporary trestle. Alternatively, the cofferdams may not be necessary if a closed fill system with sheet pile retaining members is built in the vicinity and along the alignment of the existing bridge fenders. This option will allow for the area between Pier 5 and Pier 6 to its respective banks to be dewatered and backfilled in order to provide temporary access for construction activities.

Existing footings in water and on banks will be removed to a required minimum elevation or distance below original ground.

After completion of the new bridge, all temporary cofferdam, temporary fender system, temporary erection tower, and falsework material will be removed completely from the waterway as required by the U.S. Army Corps of Engineers and the Coast Guard. A new permanent pier protective system consisting of either a closed fill system or a fender system of driven piles and barriers will be placed to protect the new bridge Pier 4. Finally, the creek banks will be stabilized and erosion control BMPs will be placed.

Reversible HOV Lane Alternative. Under this alternative, navigational impacts would be the same as under the Fixed HOV Lane Alternative, and the proposed structures would be the same under either Build Alternative. No alterations to hydraulic patterns are expected.

Access Options

The Petaluma River Bridge replacement does not vary with any of the Access Options. It would be replaced under either Build Alternative; therefore, the navigational impacts would be the same as described above.

No Build Alternative. Under the No Build Alternative, the existing structure of the bridge would remain in place, and no changes to the navigational channel are anticipated.

3.1.10.4 Avoidance, Minimization, and/or Mitigation Measures

Mainline Operations

No mitigation would be required under the Build Alternatives, as long-term impacts of the alternatives on transportation and vehicular traffic would generally be beneficial, considering the reductions in traffic delay throughout the project area. Both Build Alternatives would also provide greater capacity in the mixed-flow lanes, facilitating truck traffic and movement of goods.

Pedestrian and Bicycle Facilities

Completing the new access road system prior to beginning roadway realignment/ widening operations in Segment B would provide pedestrians and bicyclists with an alternate route during construction. These and other options would be considered during the design phase as the traffic management plan is being developed.

Construction Management Plan for Pedestrian/Bicycle Traffic. Most impacts to pedestrian and bicycle facilities as a result of street closures and detours would be temporary and construction related. Closure of some portions of access roads where bicycle and pedestrian access currently exists may be required during the construction phase of the project. It is likely that temporary access roads would be unpaved for an extended period of time.

Construction-phase measures will include providing netting under structure falsework (or other measures) to ensure that debris would not fall onto existing pedestrian and bicycle paths, and additional signage to alert bicyclists and pedestrians of construction work zones.

Coordination with Local Jurisdictions and Pedestrian/Bicycle Advisory. Caltrans will work with the counties, the cities of Novato and Petaluma, and the Bicycle Pedestrian Advisory Group to ensure that the Build Alternatives conform with existing and proposed facilities.

Construction Traffic Management Plan. Caltrans will develop a traffic management plan to safeguard work-zone safety, minimize mobility impacts, and provide up-to-date information to the public during roadway stage construction.

This plan will include a program to provide the public with information on temporary traffic impacts (e.g., detours and temporary lane closures). ITS would be in effect to provide pre-trip and en-route roadway condition information, such as advanced traveler information systems and changeable message signs. ITS also includes coordination of freeway service patrols to remove disabled vehicles as necessary.

The traffic management plan will be developed with the assistance of Caltrans Highway Operations, Traffic Management and Traffic System. Marin County, Sonoma County, the cities of Novato and Petaluma will also be consulted in the development and implementation of this plan. Caltrans will also work with the Coast Guard concerning Petaluma River Bridge operations.

Bridge Construction. Proposed construction plans, including falsework construction plans, will be submitted to the Coast Guard at least 30 days prior to the start of construction. The Coast Guard and Caltrans will coordinate with waterway users to ensure any proposed temporary structures do not impede navigation during construction. A fender system may be installed around any temporary structure erected in the waterway to protect the falsework and/or erection towers from being hit by a vessel.

3.1.11 Visual/Aesthetics

Key viewpoints were identified to represent the visual character of the project setting (Figure 3.1-16) and evaluate visual quality. The assessment of existing visual quality for each of the landscape units was based upon three criteria as defined in the FHWA Visual Impact Assessment (VIA) methodology: vividness, intactness, and unity (FHWA, 1988). These criteria are defined as follows:

- **Vividness** is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- **Intactness** is the visual integrity of the natural man-made landscape of the immediate environs and its freedom from encroaching elements.
- **Unity** is the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or inter-compatibility between landscape elements.

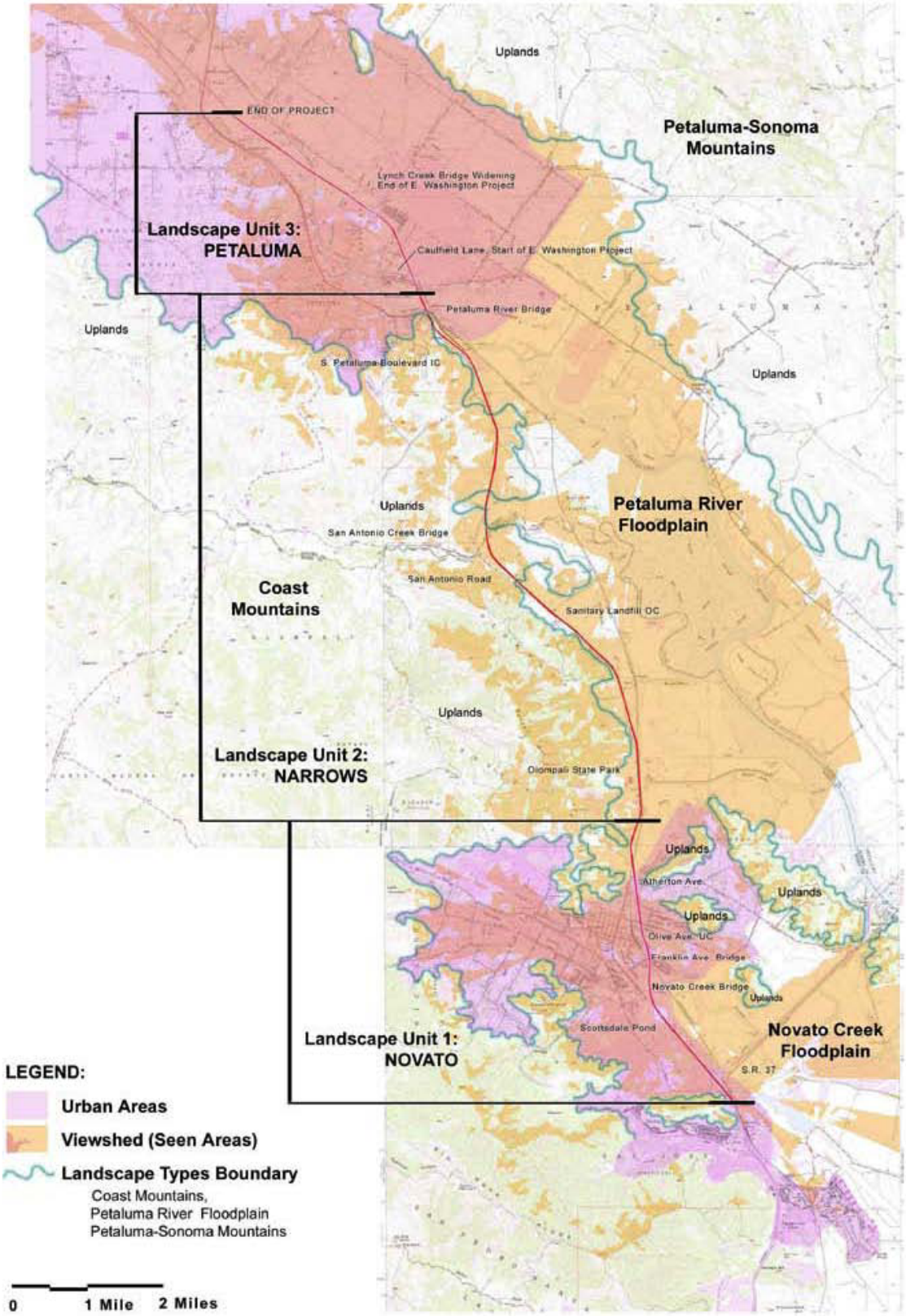
Following the FHWA methodology visual impacts are evaluated in terms of change in overall visual quality, in the context of viewer exposure and anticipated viewer sensitivity, based primarily on viewer activity type and expressions of public policy.

3.1.11.1 Regulatory Setting

NEPA establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings [42 U.S.C. 4331(b)(2)]. To further emphasize this point, the Federal Highway administration in its implementation of NEPA [23 U.S.C. 109(h)] directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

Likewise, the CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state “with…enjoyment of *aesthetic*, natural, scenic and historic environmental qualities.” [CA Public Resources Code Section 21001(b)]

Figure 3.1-16 Visual Impact Assessment Study Areas



2431

3.1.11.2 Affected Environment

The viewshed of the MSN Project area is generally bounded to the west by slopes of the Coast Range and to the east by the Petaluma-Sonoma Mountains. For purposes of analysis, the project area was divided into three major landscape units corresponding approximately to the distinctive geographic segments of the City of Novato, the Novato Narrows, and the City of Petaluma (Figure 3.1-16).

Landscape Unit 1: City of Novato (Southern Segment)

The City of Novato includes a mixture of urban and open space visual elements. As a landscape unit, the City of Novato is well-defined by intact, high wooded slopes that enclose the urbanized portions of Novato Valley on three sides to elevations of over 450 m (1,558 ft) at Burdell Mountain. These hills are visually characterized by a native live oak and mixed evergreen forest canopy. The landscape is also typified by low-rise suburban development on the valley floor and lower slopes of the Novato Valley, whose visual intactness is enhanced by a nearly continuous tree canopy that provides a visually unifying natural character to views (Figure 3.1-17).

Within the City of Novato the highway corridor is also characterized by substantial areas of open space in the immediate visual foreground, including the Anderson Rowe Open Space, Ehreth Pond Wildlife Preserve, Scottsdale Pond and Marsh, and open spaces created by portions of the SR 37 and Rowland Boulevard Interchange. Views from the highway mainline to wetland open spaces and San Pablo Bay to the east, however, are limited, constrained by topography and foreground development.

Because of intact mountain slopes and ridges to the west, the preponderance of tree canopy on the valley floor, and the abundance of public open space within the highway foreground, the visual quality in this unit, despite its urban character, is moderately high.

Landscape Unit 2: Novato Narrows (Central Segment)

North of the City of Novato the project corridor is largely undeveloped and scenically intact. The slopes of Burdell Mountain, including Olompali SHP and extensive oak woodland and grassland, dominate views to the west (Figure 3.1-18). Roadside light industrial facilities, including Gnoss Field Airport, are visible in the southernmost portion of this landscape unit but remain visually

Figure 3.1-17 Landscape Unit 1: City of Novato

Landscape Unit 1: City of Novato
(Southern Segment)

View of U.S. 101 in City of Novato, looking north toward Mount Burdell

Open Space within highway corridor, City of Novato, looking east from U.S. 101

View of City of Novato, looking west from U.S. 101

Figure 3.1-18 Landscape Unit 2: Novato Narrows

Landscape Unit 2: Novato Narrows
(Central Segment)

View of Petaluma River and floodplain, looking east from U.S. 101

Coast Range hills, oak and mixed evergreen woodland, looking west from U.S. 101

Riparian woodland, rolling oak/grassland landscape near San Antonio Creek

subordinate to the intact natural features of the landscape, including the Petaluma River to the east. The Birkenstock building and Buck Foundation, because of their distinctive architecture, contribute vivid elements to the view. The recently completed Sanitary Landfill Road Overcrossing is located north of Olompali SHP and has resulted in a decline in intactness and visual quality in the immediate vicinity. North of Olompali SHP, the landscape is also characterized by high visual quality, comprising predominantly rolling foothills with intact oak woodland/grassland, punctuated by vivid corridors of tall riparian vegetation, notably at San Antonio Creek. Southbound vistas also include dramatic views of high ridges of the Coast Mountains in the approach toward San Antonio Creek. Roadside vegetation is largely native, with segments of roadside ornamental landscaping north of Gambini Road and in the approach to the Petaluma River Bridge.

Visual sensitivity of motorists throughout the Novato Narrows is considered to be moderate to high, reflecting the high level of visual quality and a higher corresponding level of scenic orientation and expectation. Visual sensitivity of nearby residences is potentially high, but the number and exposure of such viewers in this unit are very limited.

Visual quality in the vicinity of South Petaluma Boulevard is mixed, with relatively intact pastoral hillsides near to industrial uses with moderately low visual quality. The City of Petaluma General Plan nevertheless identifies South Petaluma Boulevard as an historic city gateway. Consequently, viewer sensitivity is considered to be moderate to high in this area.

The elevated Petaluma River Bridge crossing presents panoramic views of the river and associated marshlands, valley floor, and mountains to the east. Although views are partially obscured by an opaque side barrier, this view from the south of the river and valley is an important scenic vista, marking the gateway into the City of Petaluma. From the nearby City Marina and Bay Trail, the existing viaduct and support columns of the Petaluma River Bridge are simple, uncluttered, and possess a moderate to high degree of vividness and unity within the view of river and mountains.

Overall, the visual quality of this relatively undisturbed and scenic greenbelt is high.

Landscape Unit 3: City of Petaluma (Northern Segment)

The City of Petaluma in this part of the project area includes the rapidly urbanizing valley floor and the southern end of a string of low-lying valleys that extend northward past the City of Santa Rosa (Figure 3.1-19). Although the highway corridor traverses the most urbanized portions of Petaluma between the SR 116/US 101 Lakeville Highway Separation and Overhead and Lynch Creek Bridge, that segment of highway is also landscaped with tall 20+ m (65+ ft) continuous roadside hedgerows, primarily Eucalyptus and Redwood. The Redwoods in these hedgerows show considerable stress and their long-term viability in these locations is questionable. Nevertheless, the hedgerows currently lend a vivid, recognizable community image to this segment as seen from the road, in the approach to the East Washington Interchange, a primary city gateway. Adjacent land uses in this segment, such as the Sonoma-Marin Fairgrounds to the west and residential and commercial uses to the east, are not strongly evident from the road due to dense screening by roadside trees.

Freeway overcrossings at Caulfield Lane, East Washington Street, and Corona Road punctuate views from the road but remain subordinate to the tall, visually dominant tree rows. Occasional large tree groupings also provide ornamental screening in the vicinity of the North Petaluma and Corona Road Bridges.

Sensitive visual receptors in the project area include very high numbers of motorists on US 101, with moderate levels of anticipated viewer sensitivity; and a moderately high number of homes directly adjoining the roadway in the northwest and southeast quadrants, with potentially high levels of anticipated viewer sensitivity.

Between Lynch Creek to the project terminus just north of Corona Road, tree hedgerows give way on the west to large tracts of open, level pastureland with sporadic roadside landscaping. The open terrain also provides views of the tree canopy of the Petaluma River riparian corridor a short distance of roughly 200 m (650 ft) west. These views westward are interrupted by the Petaluma Factory Outlet Mall but otherwise remain intact and of generally high visual quality. Land use types east of the highway include a nearly continuous combination of industrial, commercial and residential uses, with stands of roadside tree screening in the vicinity of the North Petaluma Railroad Overhead and a segment south of Corona Road.

Figure 3.1-19 Landscape Unit 3: City of Petaluma

Landscape Unit 3: City of Petaluma
(Northern Segment)

Roadside tree hedgerows, looking north from U.S. 101, City of Petaluma

Commercial development in highway corridor, looking west from U.S. 101

Redwood groupings south of North Petaluma Overhead crossing, looking north from U.S. 101

2536

Unity and intactness in this urbanizing landscape unit are compromised, particularly in the segment from Lynch Creek southward, and despite more intact and scenic vistas north of Lynch Creek, overall visual quality is moderate.

3.1.11.3 Impacts

This section describes the anticipated visual impacts of the Build Alternative by landscape unit. A number of key viewpoints were identified throughout the project corridor to represent the viewshed at points where project actions could potentially result in visual impacts. Computer-generated visual simulations from several of these viewpoints are included in the impacts discussion. Please note that several visual simulations depict the project area showing full mitigation after 20 years of vegetative growth. Final determination on which soundwalls will be constructed as part of the MSN Project is discussed in Section 3.2.7. Because soundwalls could be constructed that in some locations could result in an adverse visual impact, the visual simulations have been prepared to show the worst-case conditions.

Landscape Unit 1: City of Novato (Southern Segment)

Table 3.1-17 summarizes existing resources and potential sources of impact under the MSN Build Alternative within Landscape Unit 1.

Table 3.1-17 Resources and Sources of Potential Impact within Landscape Unit I (Southern Segment)

Existing Resources	Potential Sources of Impact
Open median	Paving and concrete median barrier
Bicycle path, community connector at Franklin Overhead Bridge and Olive Avenue Undercrossing	Bridge center widening
Existing landscaping at Redwood Boulevard, Armstrong Avenue, Franklin Overhead Bridge	New soundwalls
Wetland vegetation at Scottsdale Pond	Vegetation removal and construction of new retaining wall, off-ramp realignment

Northbound and Southbound HOV Lanes

Fixed HOV Lane Alternative. This is the current Preferred Alternative. Under the Fixed HOV Lane Alternative, northbound and southbound HOV lanes and a concrete center median barrier will be accommodated through widening of the center median. No median landscaping currently exists within the City of Novato, and the existing six-lane freeway is already highly dominant in character. The

qualitative increase in visual scale and dominance in this segment due to center widening will thus be moderate and will not result in a marked decline in visual quality. In the context of moderate viewer sensitivity of motorists in this landscape unit, this visual change will be moderate (see Figures 3.1-20 and 3.1-21).

Reversible HOV Lane Alternative. This alternative would be identical to the Fixed HOV Lane Alternative within Landscape Unit 1 (Southern Segment).

No Build Alternative. Under the No Build Alternative, there would be no aesthetic impacts due to center widening, addition of HOV lanes, or new center median barriers.

Soundwalls, Retaining Walls, and Associated Vegetation Removal

Fixed HOV Lane Alternative. This is the current Preferred Alternative. A soundwall location was studied east of Redwood Boulevard and south of Scottsdale Pond (see Figure 3.1-22 and Figure 3.1-23). Construction of the wall will require removal of existing landscaping, particularly at Redwood Boulevard, where existing landscaping provides substantial screening of the freeway for nearby residences, and a vivid landscape element for freeway motorists. The new walls will introduce strongly contrasting, large-scale hardscape structures into motorists' immediate visual foreground, in place of the existing views of landscaping. This strong form, color and texture contrast with the existing setting will represent a substantial change in character as seen by very high numbers of motorists, with a corresponding decline in visual quality. In the context of moderate anticipated viewer sensitivity of motorists in this urban segment, this represents a potentially substantial adverse effect.

In addition, a new 220 m (722 ft) retaining wall will be constructed on the eastern edge of Scottsdale Pond in connection with improvements to the southbound Rowland Avenue on-ramp, with associated removal of existing wetland vegetation; and a 155 m (508 ft) retaining wall will be constructed east of South Novato Boulevard. It is expected that revegetation will rapidly replace lost vegetation at Scottsdale Pond, and the new retaining wall will be designed to match the simulated stone finish of other visible concrete structures within the public park. The net long-term impacts of these measures at Scottsdale Pond will be beneficial as off-road areas with views of the South Novato Boulevard wall are virtually unused. Thus, the proposed wall will be little noticed by the nearest viewers. This wall is expected to have no impact.

Figure 3.1-20 Existing View from US 101, City of Novato, Looking North

Figure 3.1-21 Simulated View from US 101, City of Novato, Looking North

Figure 3.1-22 Existing View from Freeway Looking Northwest toward Redwood Boulevard

Figure 3.1-23 Simulated View from Freeway Looking Northwest toward Soundwall under Consideration at Redwood Boulevard with Mitigation

Reversible HOV Lane Alternative. The impacts of this alternative would be identical to the Fixed HOV Lane Alternative within Landscape Unit 1 (Southern Segment).

No Build Alternative. Under the No Build Alternative, there would be no aesthetic impacts due to new structures or loss of vegetation.

Bridge Widening

Fixed HOV Lane Alternative. This is the current Preferred Alternative. Under the Fixed HOV Lane Alternative, center widening of the Novato Creek Bridge, the Franklin Overhead Bridge, the Olive Undercrossing Bridge and North Novato Overhead Bridge will require the filling of center gaps between northbound and southbound structures. One result will be less penetration of sunlight causing a decline in visual quality.

The Novato Creek and North Novato Bridges are not heavily used by pedestrians and bicyclists. Due to the absence of sensitive receptors, impacts will be minor in those locations.

The road under the Franklin Overhead Bridge is currently used by pedestrians and bicyclists for access between the residential neighborhoods to the west and east of the freeway. This road also provides the community with access to Slade Park and other nearby open spaces. The bridge is relatively tall, allowing greater sunlight than bridges of more typical height. Nevertheless, center widening of the bridge will reduce the daylight that currently illuminates the pedestrian passage under the bridge, and degrading its visual quality and potentially undermining its use as a pedestrian and bicycle route. Because there are no nearby alternative undercrossings in the vicinity, viewers may have moderately high levels of sensitivity. In that context these impacts could be moderately adverse.

Similarly, Olive Avenue is a major connector between residential neighborhoods to the east of the freeway and the central downtown area to the west. The Olive Avenue undercrossing is currently landscaped with trees and receives moderate levels of use by motorists, pedestrians, and bicyclists traveling to and from downtown. The center widening of the Olive Avenue Bridge will result in the removal of trees and will reduce sunlight that currently illuminates the undercrossing. This loss of sunlight will create approximately 50 m (164 ft) of unlit passageway, making it less attractive and potentially deterring pedestrian use. Viewers may have moderately high levels of sensitivity to this change to a

major gateway to downtown. In this context these impacts could potentially be substantially adverse (see Figures 3.1-24 and 3.1-25).

Reversible HOV Lane Alternative. This alternative would be identical to the Fixed HOV Lane Alternative within Landscape Unit 1 (Southern Segment).

No Build Alternative. Under the No Build Alternative, there would be no bridge widenings. Therefore, there would be no impacts to the community access routes.

Light and Glare

Fixed HOV Lane Alternative. Under the Fixed HOV Lane Alternative, light and glare impacts will result primarily from temporary nighttime construction activities in proximity to various sensitive receptors, including motorists, pedestrians, and nearby residences and businesses.

Reversible HOV Lane Alternative. This alternative would be identical to the Fixed HOV Lane Alternative within Landscape Unit 1 (Southern Segment).

Landscape Unit 2*:* Novato Narrows (Central Segment)

Table 3.1-18 summarizes existing resources and potential sources of impact under the MSN Build Alternative within Landscape Unit 2.

Table 3.1-18 Resources and Sources of Potential Impact within Landscape Unit 2 (Central Segment)

Existing Resources	Sources of Potential Impact
Open median	HOV Lane center median paving and concrete median barrier
Intact oak woodland/grassland landscape	Improvements to Redwood Landfill Road IC under Access Options 4b, 12b
Intact oak woodland/grassland landscape	San Antonio Road Interchange (Access Options 4b, 14b, 14d)
Intact oak woodland/grassland landscape	New access roads parallel to mainline
Undeveloped, partially intact landforms	Major grading, landform alteration from cut slopes near Cloud Lane
Tall riparian vegetation of San Antonio Creek Large stand of Eucalyptus at San Antonio Creek	San Antonio Mainline Bridge New San Antonio Creek Bridge
Panoramic views of Petaluma River and marshlands, valley floor and mountains	New Petaluma River Bridge
City of Petaluma southern gateway	South Petaluma Boulevard Interchange

Figure 3.1-24 Existing View of Olive Avenue Bridge Undercrossing from Olive Avenue

Figure 3.1-25 Simulated View of Olive Avenue Bridge Undercrossing from Olive Avenue

HOV Lanes and Center Median Barrier

Fixed HOV Lane Alternative. This is the current Preferred Alternative. The change of US 101 from a four-lane roadway separated by an unpaved median to a single six-lane paved expanse with concrete median barrier will substantially increase the dominance of the roadway as seen by motorists. This effect will be further emphasized in some locations by the effect of new adjacent access roads and interchanges.

The increased dominance of the roadway will cause a pronounced qualitative change in the overall character of the landscape to a more urban, highway-dominated setting, with a noticeable decline in visual intactness and vividness. In the context of moderately high viewer sensitivity in this scenic unit, these impacts will potentially be substantially adverse. A typical representation of this change is depicted in Figure 3.1-26 and 3.1-27, in a view near the Olompali SHP entryway.

Reversible HOV Lane Alternative

The principal difference between the two Build Alternatives is in the configuration of HOV lanes and associated median barriers. Under the Reversible HOV Lane Alternative, a single HOV lane with 3 m (10 ft) shoulders on each side would be constructed in the center median, separated from adjacent mixed flow lanes by 0.6 m (2 ft) concrete barriers and a 1.5 m (5 ft) shoulder on each side. The total center median area between barriers would thus be 9.6 m (32 ft) in width. Access would be adjusted to allow southbound travel during the A.M. peak period and northbound travel during the P.M. peak period. The overall project cross-section would be the same as that under the Fixed HOV Lane Alternative, i.e., 34.2 m (114 ft).

Although there would be minor qualitative differences in the appearance of the two build alternatives, the total paved area would expand the same amount under both build alternatives, and the visual effects of new median barriers and increased traffic, though not identical, would be similar overall. The change in visual character and decline in visual quality under this alternative would thus be comparable to the Fixed HOV Lane Alternative. In the context of moderately high viewer sensitivity in Landscape Unit 2, this impact would potentially be substantial.

Figure 3.1-26 Existing View toward Olompali State Historic Park Entrance Looking North

Figure 3.1-27 Simulation of Typical HOV Lane Widening and Median Barrier within Landscape Unit 2 at Olompali State Historic Park Entrance Looking North

No Build Alternative. Under the No Build Alternative, there would be no addition of an HOV lane or frontage roads, and therefore no resulting impacts to the visual character of the Novato Narrows (Central Segment).

Major Project Structures

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative with Access Option 12b is the current Preferred Alternative. Under this Build Alternative, major project structures and Access Options in the Central Segment will be essentially the same. Under the preferred Access Option 12b, the Redwood Landfill Overcrossing will be modified to a diamond interchange. Impacts under Access Option 4b would be the same as under 12b at the Redwood Landfill Overcrossing. Access Options 14b and 14d call for only slight modifications to the overcrossing to convert the facility from private to public access. Overall, impacts at Redwood Landfill Road due to the Access Options will be incremental and relatively minimal, since substantial disruption and intrusion due to the recently constructed overcrossing have already taken place (Figure 3.1-28). In addition, additional oak tree removal associated with expansion of the interchange will nevertheless leave the extensive adjacent oak and mixed evergreen forest as a vivid, visually dominant element in the view, with little net change in overall visual quality as a result.

Under Access Options 4b, 14b, and 14d, a new San Antonio Road Interchange would be constructed between Silveira Dairy and San Antonio Creek. Figures 3.1-29 and 3.1-30 depict the existing conditions and a simulation of this new interchange, respectively. The interchange would have strong visual contrast and dominance against the existing natural/pastoral setting, with a strong resulting decline in visual quality due to major grading, engineered fill embankments, a new over-crossing bridge, and associated ramps, access roads, signs and lighting. In the context of moderately high viewer sensitivity in this unit, this would represent a substantial adverse effect. Affected viewers would consist primarily of highway motorists. However, there are also several residences associated with the Silveira Dairy within foreground distances of the interchange that could experience some impact due to visibility of various interchange features. For these reasons, Access Option 12b, which will not introduce a new San Antonio Road Interchange, has been considered somewhat preferable to the other options from a visual perspective. Access Option 12b is the current Preferred Alternative.

Figure 3.1-28 View of Existing Landfill Interchange (June 2006)

Figure 3.1-29 The Narrows, North of Olompali State Historic Park Approaching San Antonio Road on West Side of US 101

Figure 3.1-30 Proposed San Antonio Road Interchange showing Access Option 14b
Access Options 4b with Mitigation; 12b, and 14d not shown

A new interchange is proposed at South Petaluma Boulevard under all Access Options. Although the affected setting is less intact than at the San Antonio Interchange site, this area is identified as an historic southern gateway to the City of Petaluma in the Petaluma General Plan, and is thus assigned a moderately high level of viewer sensitivity, with high exposure to large numbers of motorists. Visual changes will be similar to those of the San Antonio Interchange, with a strong resulting decline in visual quality and thus, potentially substantial adverse effects. In addition to highway motorists, a small number of nearby residents could also potentially be affected by the interchange.

Figure 3.1-31 shows the existing US 101 at South Petaluma Boulevard looking north towards the City of Petaluma and Figure 3.1-32 is a simulation of the proposed South Petaluma Boulevard Interchange.

The freeway mainline will be realigned westward on a newly constructed San Antonio Creek Freeway Bridge. A portion of the existing freeway bridge will be retained to serve an adjoining access road, and the remainder will be removed. Figures 3.1-33 shows the existing San Antonio Creek Freeway Bridge and Figure 3.1-34 shows the simulation. The principal visual effect of the construction of a new San Antonio Creek Freeway Bridge will be loss of riparian trees at the creek crossing in views from the road. Because the bridge will be constructed on a new alignment, portions of the existing freeway bridge to be removed will expose un-vegetated portions of the creek. These, together with portions cleared for construction of the new bridge, could represent a conspicuous loss of riparian forest in the freeway foreground as seen by high numbers of viewers with moderately high sensitivity, a potentially substantial adverse impact. With recommended re-vegetation however these areas are expected to be fully restored within a fairly short period of time (roughly five years), with no net adverse long-term impact.

Effects on nearby residents and future bike path users from increased visibility of the freeway bridge will be moderate due to the very small number of affected viewers and the limited visual prominence of the highway even at this relatively short distance (Figures 3.1-35 and 3.1-36).

As in existing pedestrian undercrossings in Novato and Petaluma, a proposed bicycle path undercrossing beneath the freeway bridge will require artificial lighting to facilitate safe use.

Figure 3.1-31 Existing US 101 South Petaluma Boulevard Looking North toward the City of Petaluma

Figure 3.1-32 Simulation of the proposed South Petaluma Boulevard Interchange with Mitigation Looking North toward the City of Petaluma
All Project Alternatives are the Same at this Location.

Figure 3.1-33 Existing View of San Antonio Creek Freeway Bridge, Looking North

Figure 3.1-34 Simulation of Proposed San Antonio Creek Freeway Bridge and Freeway Realignment; Access Option 4b with Mitigation

Alternatives 14b and 14d are the same as 4b at this location; Alternative 12b is not shown

Figure 3.1-35 Existing View toward Location for a New San Antonio Creek Mainline Bridge from Proposed Bike Path

Figure 3.1-36 Simulated View toward New San Antonio Creek Mainline Bridge from Proposed Bike Path with Mitigation

A new San Antonio bridge is proposed to serve westbound traffic from an extension of existing San Antonio Road. Figures 3.1-37 and 3.1-38 show the historic San Antonio Creek Bridge and the proposed new San Antonio Frontage Road Bridge. The historic San Antonio Creek Bridge will be retained and striped for one lane and Class 2 bicycle/pedestrian access. A new frontage road bridge will be constructed for two-way vehicular traffic and a Class 2 bicycle/pedestrian path to accommodate motorists traveling to and from destinations to the west. The new roadway and structure will have a minor impact on visual quality of views to and from the road; the principal impacts of construction at this location will be due to removal of riparian trees within the bridge construction footprint; and partial removal of a large stand of tall Eucalyptus northwest of the new bridge. Removal of riparian trees for bridge construction will leave prominent remaining adjacent riparian woodland and have a minor visual effect. The removal of Eucalyptus trees will represent the loss of a large, vivid landscape feature but will not appreciably detract from the intactness and unity of the highly natural setting overall. Therefore, the net overall change in visual quality in this location will be minor.

Under the Fixed HOV Lane Alternative, the existing Petaluma River Bridge will be replaced (see Figure 3.1-39). Two preferred bridge design alternatives are under consideration and involve construction of a shorter structure than the existing bridge. Both will require extension of the north embankment southward toward the river to meet the shorter new span. This extension of the earth embankment will somewhat reduce westward views from the Bay Trail and City Marina. One design alternative is a cast-in-place box girder structure with parabolic haunched soffit to provide a visually pleasing curved pattern, supported by five tapered concrete columns. The other is a pre-cast “tee girder” structure, supported by five round concrete columns. A curtain wall could be installed on the outer edges to simulate a haunched soffit. Both alternatives will include pattern-texture on railings and the MSE retaining wall on the east side of the northern embankment, as shown in Figure 3.1-40.

Among the range of feasible designs under consideration, none represent a substantial decline in the overall existing visual quality of on- or off-road views. Views beneath the bridge to the west from the Bay Trail and Petaluma Marina, although reduced somewhat, will be substantially retained. The bridge and retaining wall will incorporate design enhancements that could represent a beneficial impact to visual quality.

Figure 3.1-37 Historic San Antonio Creek Bridge

Figure 3.1-38 Historic San Antonio Creek Bridge, and to the West, New San Antonio Creek Access Road Bridge under Build Alternative

Figure 3.1-39 Existing Petaluma Bridge Looking East

Figure 3.1-40 Simulation of Proposed Petaluma River Bridge Design (Pre-cast Tee Girder Option)

Reversible HOV Lane Alternative. Under the Reversible HOV Lane Alternative, major project structures and Access Options would be essentially the same as under the Fixed HOV Lane Alternative. Anticipated visual impacts would thus be as described above.

No Build Alternative. Under the No Build Alternative, there would be no change in the visual character of the Narrows due to new structures, except for the Sanitary Landfill Road Overcrossing. As already noted, this recently completed structure has impacted the visual character of the Novato Narrows (Central Segment) in the vicinity of Olompali SHP.

Tree and Vegetation Removal

Fixed HOV Lane Alternative. All aspects of the two build alternatives, except for center widening, will result in some tree and vegetation removal, through mainline realignment, roadway profile changes, new interchange construction, and building new access roads. The two build alternatives are essentially identical with respect to potential tree and vegetation removal within the Central Segment.

New interchange construction would result in tree and other vegetation removal, with the greatest occurring under Access Option 12b due to an additional access road on the western side of US 101(see access road alignment in Volume 2 of the FEIR/S). Although the total number of trees to be removed represents a small portion of the existing tree population within the corridor viewshed, the affected tree stands in the highway visual foreground represent an important, defining component of the landscape character. Therefore, tree removal could have substantial adverse effects in specific locations, such as stream crossings, interchanges, and swales. In the context of moderate to high motorist visual sensitivity, this impact could be substantially adverse. Despite the greatest occurrence of tree loss under Access Option 12b, it is the current Preferred Alternative and has the least overall negative visual impacts.

Reversible HOV Lane Alternative. Under the Reversible HOV Lane Alternative, tree and vegetation removal would be essentially the same as under the Fixed HOV Lane Alternative. Anticipated visual impacts would thus be as described above.

No Build Alternative. Under the No Build Alternative, there would be no vegetation or tree removal other than that currently underway for construction of the City of Novato Sanitary Landfill Road Overcrossing. The mitigation plantings

under this recently completed project would mature and reduce aesthetic impacts over time. The remainder of the Novato Narrows (Central Segment) would be unchanged.

Mainline Realignment Cut Slopes

Fixed HOV Lane Alternative. This is the current Preferred Alternative. Since the centerline, profile and overall project footprint are be the same, mainline realignment, profile changes and cut slopes will be essentially identical under both Build Alternatives. Mainline realignment and profile changes, as well as the construction of access roads and new interchanges, could involve major grading and alteration of existing landforms. Cut slopes and fill embankments in various locations may result in prominent, unnatural landforms that contrast with the existing topography. These impacts could alter the natural landscape character and result in a decline in visual quality. In general, new fill slopes may not to be noticed by freeway travelers, but be more evident to off-road viewers, who in this project segment are very few in number. Large cut slopes on the other hand will be noticeable to motorists, particularly where they result in artificial, geometric surfaces along the roadway. In some segments, particularly between San Antonio Road and Gambini Road in the vicinity of Cloud Lane, extensive cuts of up to 13 m (43 ft) in depth could be required to lower the existing mainline vertical profile to conform to freeway standards. The most extensively affected segment at the crest of the hill is already characterized by substantial cut slopes from previous roadway construction, which have a flat, geometric, engineered character in contrast to the natural landforms of the rest of the corridor, particularly to the south (Figure 3.1-41).

The proposed roadway realignment will substantially increase the scale of those existing geometric slopes. Despite the already compromised condition of landforms in this segment, this large-scale alteration will represent a highly prominent change in landscape character and a strong decline in visual quality, with a marked loss of both intactness and unity. On the other hand this hillcrest segment marks a dividing line between north- (toward Petaluma River) and south-facing (toward San Antonio Creek) viewsheds of the corridor, and the lowering of the crest profile, together with road widening, will increase and improve freeway motorists' long views both northward (to the Petaluma Mountains) and southward (to the Coast Mountains), enhancing vividness to a degree, a somewhat beneficial effect. Overall, however, in the context of moderate-to-high viewer sensitivity, these landform changes will be substantially adverse (Figure 3.1-42).

Figure 3.1-41 Existing View of Proposed Mainline Horizontal and Vertical Realignment in Vicinity of Cloud Lane, Looking North

Figure 3.1-42 Simulated View of Proposed Mainline Horizontal and Vertical Realignment in Vicinity of Cloud Lane, Looking North with Mitigation, shown here with Access Option Alternative 12b

Reversible HOV Lane Alternative. Since the centerline, profile and overall project footprint are the same, mainline realignment, profile changes and cut slopes would be essentially identical under both build alternatives.

No Build Alternative. Under the No Build Alternative, there would be no grading or alterations to landforms in the Novato Narrows (Central Segment) of the project boundaries.

New Access Roads and Bike Paths

Fixed HOV Lane Alternative. Four Access Options are under consideration for the Novato Narrows (Central Segment). Under these four options, proposed major project features are broadly comparable, except for Access Option 12b, which will not introduce a major new interchange at San Antonio Road and will not require a new access road between San Antonio Interchange and Skinner Road, as under the other three options. For this reason, Access Option 12b is considered somewhat superior to the others from a visual perspective, and is the current preferred Access Option. Similar to the other Access Options, 12b will provide various new roads and bike paths will provide local access to adjoining land uses between the existing Landfill Interchange and the proposed South Petaluma Boulevard Interchange. These access roads will each contribute to an overall decline in visual quality of the highway corridor in the Narrows due to the additional paving, grading, and tree removal within the corridor visual foreground, and a resulting increased road dominance as seen from the freeway. These effects will be accentuated where road cuts are required. This increase in visual scale of the roadway will represent a potentially substantial adverse effect without mitigation to screen and soften views of the access roads.

Similarly, the experience of bicyclists on proposed bike paths paralleling the freeway could be strongly compromised by the dominance of the freeway without re-vegetation between the bike paths and freeway to provide screening.

Wherever access roads or bike paths parallel to the freeway occur, native re-vegetation planting will be installed in the visual foreground of the Novato Narrows (Central Segment) between the freeway and access roads in order to counter both site-specific and corridor-wide declines in visual quality and existing rural character (Figures 3.1-43, 3.1-44, and 3.1-45).

Figure 3.1-43 Existing View of Typical Proposed Access Road Location, West of Mainline Near Dairy

Figure 3.1-44 Simulated View of Proposed Access Road West of Mainline Near Dairy; Access Option 14d with Mitigation

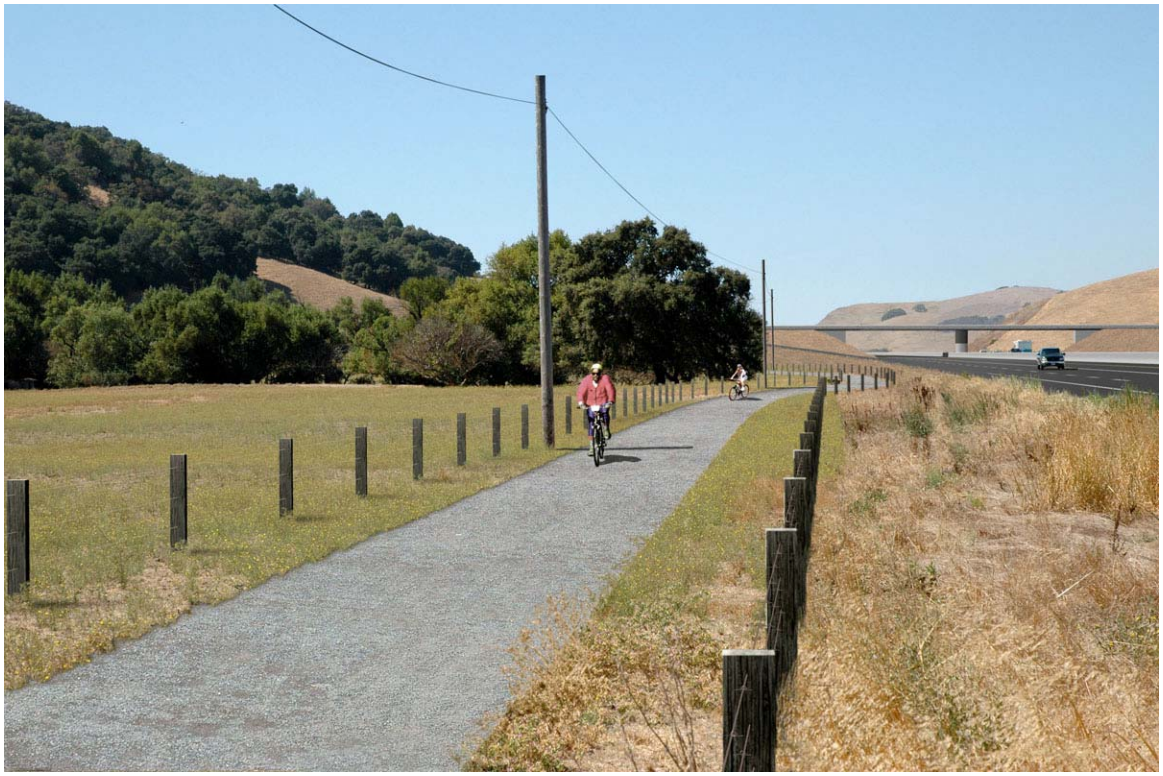


Figure 3.1-45 Simulated View from Typical Bike Path West of Mainline Near Dairy; Access Option 4b with Mitigation; Access Options 12b and 14b not shown

Reversible HOV Lane Alternative. Under the Reversible HOV Lane Alternative, Access Options would be essentially the same as under the Fixed HOV Lane Alternative. Anticipated visual impacts would thus be as described above.

No Build Alternative. Under the No Build Alternative, no new access road would be constructed and no impacts would be anticipated.

Potential Light and Glare Impacts

Fixed HOV Lane Alternative. This is the current Preferred Alternative. Potential light and glare impacts will result primarily from temporary nighttime construction activities in proximity to various sensitive receptors, including motorists, pedestrians, and nearby residences and businesses. In addition, interchange lighting and new headlight glare could potentially affect some residences near the new interchanges.

Reversible HOV Lane Alternative. Potential light and glare impacts of this alternative would be the same as the Fixed HOV Lane Alternative, as described above.

No Build Alternative. Under the No Build Alternative, no new sources of light and glare are expected and no impacts are anticipated.

Landscape Unit 3: City of Petaluma (Northern Segment)

Major visual components of the Build Alternative within Landscape Unit 3 are described in detail below under the discussion of new project structures.

In Landscape Unit 3 the No Build Alternative includes the East Washington Interchange Improvement Project, which will precede the MSN Project and include new northbound and southbound on-ramps. Soundwalls would not be required under the No Build Alternative.

Table 3.1-19 summarizes improvements proposed under the MSN Build and No Build Alternative within Landscape Unit 3.

Table 3.1-19 Existing Resources and Sources of Potential Impact within Landscape Unit 3 (Northern Segment)

Existing Resources	Sources of Potential Impact
Build Alternatives	
Open median	Paving of HOV lanes and concrete median barrier
Redwood and Eucalyptus hedgerows northwest and southeast of the East Washington Interchange	Removal of approximately 2,580 linear m (8,464 linear ft) of existing Redwood, Eucalyptus and oak due to speed change lane widening and soundwall construction.
Redwood trees adjoining Lynch Creek Bridge	Removal of existing Redwood trees due to bridge widening.
Existing trees at fence-line of homes on Lynch Creek Way	Removal of existing trees and replacement with 230 m (754 ft) soundwall north of Lynch Creek.
Eight mature, healthy Redwood tree groupings between Lynch Creek and Petaluma Outlet Mall	Loss of Redwood groupings in right-of-way due to North Petaluma Overhead Bridge replacement.
Landscaping within East Washington Interchange	Potential removal of Redwoods within East Washington Interchange due to bridge widening, off-ramp and connecting loop reconfiguration.
Young Redwood hedgerow east of US 101 south of Corona Road	Potential removal of Redwood trees for widening and safety south of Corona Road.
Screening of adjacent residents from auto light and glare by existing roadside tree hedgerows	Temporary exposure to headlight glare due to tree removal.
No Build Alternative	
	No impacts

Northbound and Southbound HOV Lanes

Fixed HOV Lane Alternative. This is the current Preferred Alternative. Paving into the center median for the addition of HOV lanes and a concrete median barrier will increase the paved area from four to six lanes. Due to the highly urbanized existing character of the highway corridor in this segment, the resulting qualitative change in the roadway environment will be less dramatic than in the Novato Narrows (Central Segment). In the context of moderate sensitivity of motorists in this landscape unit, this change will represent a moderately adverse effect.

Reversible HOV Lane Alternative. Within the Northern Segment, this alternative would be essentially identical to the Fixed HOV Lane Alternative, described above.

No Build Alternative. Under the No Build Alternative, there would be no lane additions, increased paving in the median, or concrete center median barrier. Therefore, there would be no aesthetic impacts under this alternative.

New Project Structures

Fixed HOV Lane Alternative. Major new structural features under this Build Alternative include:

- **Bridge Widening/Replacements:** replacement of the northbound US 101/ SR 116/Lakeville Highway separation and overhead bridge; widening of the southbound SR 116/US 101 separation and overhead bridge; widening of the Washington Creek and Lynch Creek Bridges; replacement of the North Petaluma overhead bridge; associated ramp widening including addition of HOV bypass and ramp metering;
- **New Soundwalls:** new soundwall locations were studied on the west side of the Lynch Creek Bridge; on the western highway shoulder between the Lynch Creek Bridge and the East Washington Interchange; on the eastern (northbound) highway shoulder between the East Washington Interchange and SR 116; and at the eastern (northbound) shoulder directly north of Lynch Creek; and
- **New Auxiliary Lanes:** a new northbound speed change lane will be introduced between Caulfield Road and the East Washington Interchange; and a new southbound speed change lane will be introduced between the Lynch Creek Bridge and the East Washington Interchange, requiring outside widening of the highway. On-ramp re-configuration at the SR 116/US 101 Interchange could also require additional roadway widening on the east side of the highway south of Caulfield Road.

Overall, the proposed bridge widenings and replacements will modify existing structures but the resulting condition will appear qualitatively similar to the existing and not be highly conspicuous to motorists after completion of construction. No adjacent residences or other sensitive off-road land uses are present to be strongly affected by these bridge improvements. The primary visual effect of these actions will result from temporary construction activities.

The principal project visual impacts in Landscape Unit 3 will result from introduction of proposed speed change lanes, the soundwalls that were studied, and associated roadside tree removal.

From the vicinity of Ponderosa Drive and Cedarwood Lane to Caulfield Lane, the northbound on-ramp of the SR 116/US 101 Interchange will be widened to accommodate ramp metering. Widening of the on-ramp could potentially require tree removal south of Caulfield Road on the east side of the highway. In the worst case, the existing hedgerow of live oak trees could potentially be removed, an adverse impact on visual quality and community image as seen from the road. If tree removal is required, replacement planting will be implemented, substantially reducing potential impacts in the long term.

A new northbound speed change lane will be introduced on the eastern (northbound) edge of roadway between Caulfield Road and the East Washington Interchange. A roughly 1,760 m (5,775 ft) –long and 3.7 m (12 ft) –high soundwall on the eastern (northbound) highway shoulder between SR 116 and the East Washington Interchange would also be introduced. If approved, the entire soundwall would be located at the edge of shoulder. The speed change lane widening and wall construction will require removal of the existing hedgerows of Eucalyptus and some Redwood that currently line the highway in this segment, as discussed further below. Figure 3.1-46 depicts the view of the existing eastern highway shoulder between Caulfield Road and the East Washington Interchange, looking northeast; Figure 3.1-47 depicts a simulated view.

Similarly, a new speed change lane was studied and a roughly 795 m (2,608 ft) -long and 3.7 m (12 ft) -high soundwall on the western (southbound) highway shoulder between the Lynch Creek Bridge and the East Washington Interchange. If approved, the entire soundwall will be located at the edge of shoulder, continuing into the reconfigured East Washington Interchange. The speed change lane widening and wall construction in this northwest quadrant will require removal of the existing Redwood and Eucalyptus hedgerows that currently line the highway in this segment. Figure 3.1-48 shows the existing view looking north from the East Washington Avenue Overcrossing. Figure 3.1-49 is a simulated view looking north, depicting the studied soundwall northwest of the interchange, and a potential cumulative project impact on-ramp northeast of interchange.

For adjacent residences in the northwest and southeast quadrants of the East Washington Street Interchange, existing views to the road now dominated by the tall tree rows will be transformed into views of the soundwall, partly screened by existing backyard fencing, and with a soil slope descending from the edge of

Figure 3.1-46 Existing View of Shoulder North of Caulfield Road Looking Northeast

Figure 3.1-47 Simulated View of North of Caulfield Road Looking Northeast, shown with Soundwall and Vine Planting

Figure 3.1-48 Existing View Looking North from East Washington Avenue Overcrossing

Figure 3.1-49 Simulated View Looking North, Depicting Soundwall Location Studied Northwest of Interchange and Cumulative Project On-ramp Northeast of Interchange

shoulder to existing grade at the project right-of-way. Figure 3.1-50 depicts a typical existing view of the highway shoulder as seen from the residential side, looking northwest from the pedestrian bridge near Stuart Drive and McKenzie Avenue. Figure 3.1-51 depicts a simulated view as seen from adjoining residences, with the East Washington Interchange project southbound on-ramp depicted across the freeway.

A new 230 m (754 ft) soundwall will be introduced on the east (northbound) highway right-of-way directly north of Lynch Creek.

If constructed, the three proposed soundwalls will represent prominent, visually dominant new hardscape structures, with adverse visual effects for motorists, adjoining residents, and other off-road viewers. These impacts could be experienced in connection with the loss of Redwood and Eucalyptus trees, discussed below.

Reversible HOV Lane Alternative. The new project structures would be the same as those introduced under the Fixed HOB Lane Alternative. The impacts would be the same as those described above.

No Build Alternative. Under the No Build Alternative, no new structures are proposed.

Tree and Vegetation Removal

Fixed HOV Lane Alternative. This is the current Preferred Alternative. The soundwall and speed change lane construction described above will require removal of all or most of the hedgerows of Eucalyptus and Redwood trees in the northwest and southeast quadrants of the East Washington Interchange, that currently visually dominate Landscape Unit 3 between the SR 116/US 101 Interchange and Lynch Creek. These nearly continuous hedgerows reach heights of over 20 m (65 ft) and provide almost complete screening between the highway and adjoining land uses. The MSN Project will result in the removal of approximately 820 m (2,690 linear ft) of mixed Eucalyptus and Redwood hedgerow in the highway quadrant northwest of the East Washington Interchange to Lynch Creek; and approximately 1,760 linear m (5,774 ft) of live oak, Eucalyptus, and some Redwood in the southeast quadrant from the SR 116/ US 101 northbound on-ramp to the East Washington Interchange. As discussed in Chapter 5, Cumulative Impacts, these impacts in combination with similar impacts of other potential future projects in the vicinity of the interchange could

Figure 3.1-50 Typical Existing View of Highway Shoulder (Northern Segment) as seen from the Residential Side, Looking Northwest from the Pedestrian Bridge near Stuart Drive and McKenzie Avenue

Figure 3.1-51 Simulated View as seen from the Pedestrian Bridge near Stuart Drive and McKenzie Avenue, shown with Soundwall

result in the total cumulative removal of this visually dominant landscape feature that currently defines the landscape character of the Northern Segment between SR 116 and Lynch Creek.

The loss of vividness, intactness and unity from loss of the tree hedgerows and their replacement by speed change lanes and soundwalls will represent a pronounced decline in existing visual quality of Landscape Unit 3 as viewed from the road. This decline in visual quality of motorists will result both from the loss of the tree canopies and from the loss of screening and resulting exposure of views of fencing and residences, with a further decline in visual unity and intactness. The poor existing health of many of the affected Redwoods suggests that many may be in decline and could eventually die. Nevertheless, the change in visual character and quality will represent a substantial adverse decline in the visual quality of motorists' views and of community image at a City gateway. This change to motorists' views in the northwest interchange quadrant was depicted in Figure 3.1-49, above, with recommended vine planting on walls. In the southeast interchange quadrant, this change was depicted in Figure 3.1-47 and Figure 3.1-51, above.

For residents adjacent to the highway, removal of the existing tree rows at their property line will represent a substantial decline in vividness and intactness. In the northwest interchange quadrant, the loss of tree canopy will be experienced along with the introduction of tall soundwalls at the back lot lines. In the southwest quadrant, the loss of trees will also partially expose views of the freeway. With recommended replacement planting, however, freeway screening will be restored over a period of a few years. Among the residences to the southeast and northwest of the East Washington Interchange, many who reportedly experience the existing Eucalyptus as a nuisance could perceive their removal as a beneficial impact (Payran/McKinley Neighborhood Action Committee, 2002).

Substantial tree removal will also take place on both the east and west sides of the Lynch Creek Bridge to accommodate bridge widening and soundwall construction, with a moderate resulting decline in visual quality for pedestrians and bicyclists on the Lynch Creek trail in views toward the road, as depicted in Figure 3.1-52, showing the existing condition, and Figure 3.1-53, showing the simulated view.

Figure 3.1-52 Existing Lynch Creek Bridge from Bike Path Looking East

Figure 3.1-53 Proposed Lynch Creek Bridge with Soundwall

In addition to those trees removed for widening of the Lynch Creek Bridge, additional trees near western property line of residences on Lynch Creek Way will be removed due to soundwall construction, resulting in a temporary loss of screening and a decline in visual quality for the affected residents.

Re-configuration of the northbound off-ramp and connecting loop at the East Washington Interchange as part of the MSN Project could potentially result in removal of some or all prominent existing Redwood trees on the interchange embankment, resulting in further decline in the visual quality of the community gateway image as viewed from the road.

Raising of the US 101 vertical profile in order to construct a new replacement North Petaluma Overhead Bridge in the segment roughly between Lynch Creek and the Petaluma Outlet Mall will result in the removal of all or portions of eight major mature, healthy Redwood tree groupings within the project right-of-way. These groupings represent a vivid, highly distinctive scenic feature of the Petaluma portion of the highway foreground viewshed. Their removal will represent a substantial decline in visual quality of this segment, and a substantial adverse visual effect.

Proposed shoulder widening southeast of the Corona Road Interchange could require removal of roughly 400 linear m (1,312 ft) of existing young Redwood trees (predominantly 8 m (25 ft) or less in height), resulting in a decline in visual quality for freeway motorists. If the trees require removal, this will also constitute a substantial decline in screening and visual quality for the adjacent residents. In the context of high assumed viewer sensitivity of residents, this will represent a potentially substantial impact. The effects in this location are depicted in Figure 3.1-54, showing the existing condition, and in the simulated view shown in Figure 3.1-55, with recommended replacement planting.

Taken as a whole, the proposed tree and vegetation removal within the Northern Segment would represent a prominent decline in the visual character and quality of the project setting, and a potentially substantial adverse visual impact for both motorists and adjacent residents.

Reversible HOV Lane Alternative. Within the Northern Segment, this alternative would be essentially identical to the Fixed HOV Lane Alternative, described above.

Figure 3.1-54 Existing Highway Shoulder Southeast of Corona Road, Looking Southeast from Corona Road Overcrossing

Figure 3.1-55 Simulation of Proposed Road Widening Southeast of Corona Road, shown with Mitigation Planting

No Build Alternative. Under the No Build Alternative, no improvements would take place and thus no visual change would occur.

Visual Impacts to Pedestrians from Bridge Widenings

Fixed HOV Lane Alternative. Widening into the center of the Lynch Creek Bridge will reduce daylight for bicyclists and pedestrians underneath the structure, thereby degrading its visual quality. Because there are no comparable pedestrian routes across the freeway in the vicinity and the creek trail receives substantial use, viewer sensitivity is potentially high and this will represent a potentially substantial adverse impact. The existing and proposed improvements at Lynch Creek were previously shown in Figures 3.1-52 and 3.1-53.

Reversible HOV Lane Alternative. Within the Northern Segment, this alternative would be essentially identical to the Fixed HOV Lane Alternative, described above.

No Build Alternative. Under the No Build Alternative, bridge center widening would not take place and no impacts would be anticipated.

Light and Glare

Fixed HOV Lane Alternative. Potential light and glare impacts will result primarily from temporary nighttime construction activities in proximity to various sensitive receptors, including motorists, pedestrians, and nearby residences and businesses.

Temporary adverse impacts from headlight glare could also occur to residents southeast and northwest of the East Washington Interchange after removal of existing tree hedgerows and prior to completion of new soundwalls in both quadrants.

Reversible HOV Lane Alternative. Within the Northern Segment, this alternative would be essentially identical to the Fixed HOV Lane Alternative, described above.

No Build Alternative. Under the No Build Alternative, existing trees lining US 101 would continue to screen nearby residences southeast and northwest of the East Washington Interchange from headlight glare.

Potential Construction Impacts

Fixed HOV Lane Alternative. Under this Build Alternative temporary but substantial visual impacts could potentially result from various roadway, interchange, bridge and soundwall construction activities, and from construction staging. Although temporary, many construction impacts could last a considerable period of time and, in the case of vegetation and ground disturbance, continue for 1-2 seasons following completion of construction.

Reversible HOV Lane Alternative. Within the Northern Segment, this alternative would be essentially identical to the Fixed HOV Lane Alternative, described above.

No Build Alternative. Under the No Build Alternative, construction-staging impacts associated with on-ramp construction of the East Washington Interchange Improvements Project would be anticipated. These impacts would be smaller in extent and duration than the Build Alternative, but would be qualitatively similar and substantial.

3.1.11.4 Avoidance, Minimization, and/or Mitigation Measures

The following general mitigation measures are grouped to correspond to generic impact types occurring throughout the project corridor, as identified in the impact discussions above.

Corridor-Wide Mitigation Design Concepts

Corridor-wide and project segment-specific aesthetic design considerations for the MSN Project shall be reviewed in coordination with the Policy Advisory Group (PAG). Topics shall include architectural design treatments: soundwalls, retaining walls, bridges; highway planting, bike trail development, interchange, City-wide, and corridor design themes; and others pertinent to the aesthetic integrity of the project. Committee recommendations will also be considered as mitigation measures. Representatives from Caltrans Office of Landscape Architecture, the cities of Novato and Petaluma, and Marin and Sonoma County participate in this committee. Its ongoing work is intended to stimulate discussions with the public through the PAG and other informational meetings.

Mitigation Measures for increased dominance of roadway and decline in overall roadway visual quality as a result of road widening and addition of new center median barriers

- Standard project landscaping and additional re-vegetation shall be employed that will increase the existing amount of landscaping in the freeway visual foreground over the long term, in order to enhance its vividness and intactness to compensate for loss of visual quality due to increased roadway dominance.

- Concrete center median design treatments shall be implemented in Landscape Unit 2, including scoring, sand-blast, and other treatment as determined by Caltrans and the PAG.

Mitigation Measures for visual intrusion/alteration of landscape character by introduction of prominent new project structures

- Standard project landscaping and additional re-vegetation shall be employed to increase the existing amount of landscaping in the freeway visual foreground over the long term, in order to provide screening and enhance its vividness and intactness to compensate for corridor-wide loss of visual quality

- Landscaping measures shall include tree and shrub plantings in areas between the mainline and proposed access roads and bike paths to provide screening and reduce overall roadway dominance

- Architectural design measures shall be applied to major structures including bridges, soundwalls, and interchange overcrossings, to enhance visual compatibility with the surrounding community, reduce visual monotony and add visual variety and interest. Such measures may include concrete surface texture and color treatments, community identity design themes, specification of non-standard fixtures and accoutrements, and other measures as developed by Caltrans in consultation with the PAG.

- Where feasible, clinging vines and/or shrubs shall be planted to cover and screen views of all new soundwalls and retaining walls from the road and from any adjacent off-road sensitive receptors in the shortest feasible period of time.

- Right-of-way fencing within Landscape Unit 2 (Central Segment) shall be Caltrans standard rural fencing. In the frontage of Olompali SHP, wood fencing shall be employed.

Mitigation Measures for tree/vegetation removal

Minimization or avoidance of tree/vegetation removal due to construction:

- In areas where maximum protection of vegetation is desirable, as specified in the VIA or in the field during the project design phase, clearing and grubbing is only to occur within excavation and embankment slope limits.
- Existing vegetation outside of clearing and grubbing limits shall be protected from the contractor's operations, equipment, and materials storage.
- Tree trimming by the contractor shall be limited to that required in order to provide a clear work area.
- High visibility protective fencing shall be placed around trees to be protected prior to the commencement of roadway construction.
- All trees to be removed shall be field marked by the Engineer and approved by the Engineer prior to removal
- Wherever feasible, slope lines shall be adjusted to avoid tree removal
- Design exceptions shall be implemented where feasible to avoid removal of significant existing vegetation. Design exceptions may include reducing the width of the standard grading catch line to minimize vegetation removal; steepening of cut and fill slopes; installation of guardrails around selected trees to allow retention at the shoulder; or other measures as recommended in the VIA or in the field during the project design or construction phases.
- If interchange realignments require removal of existing Redwoods, replacement planting of Redwoods and other trees, if feasible, shall be implemented within the East Washington Interchange to restore the community gateway image.
- In order to off-set declines in vividness and intactness due to tree removal elsewhere in the project segment, additional new Redwood and other tree plantings shall be installed on the earth embankments within the interchange, particularly near the mainline, to the degree feasible and consistent with required standard sight lines and other safety considerations.

Replacement Landscaping (Standard Highway Planting, Revegetation):

- Replacement landscaping shall be implemented per Caltrans safety standards
- Replacement landscaping shall be funded through the parent roadway contract and completed as a separate contract within two years of completion of all roadwork.
- Revegetation: All disturbed areas shall be provided with permanent erosion control grasses and, additionally, appropriate, locally native annual, shrub and tree species. Areas of disturbed native vegetation shall be replaced at a 5 to 1 ratio in place and in kind wherever feasible in the Central Segment. Where in-place planting is not practical, planting will be replaced, where feasible, off-site in the visual foreground of the corridor.

Standard Highway Landscaping

Mitigation Measures impacts to community access routes at freeway under-crossings due to bridge widening

- Lighting shall be provided beneath the under-crossings to provide sufficient illumination for pedestrian and bicycle use at all times, including daylight hours in order to create an attractive and visually appealing setting.
- Structure design features such as bridge parapet and slope paving color or texture shall be implemented as developed under the corridor design concepts.
- Landscaping shall be provided at undercrossing entrances to enhance the gateway statement and emphasize their use as access routes, including in areas outside the under-crossing where feasible.
- Design enhancements such as opportunities for community-sponsored artwork shall be considered in development of corridor design concepts.

Mitigation Measures for major grading and landform alteration

- Contour grading and contour rounding shall be employed at slope transitions in all major grading activities, to minimize the artificial, engineered appearance of resulting slopes and to blend with the natural topography to the greatest feasible extent.
- Where the alignment of the freeway or ramps are to be superseded, existing pavement and roadbed shall be removed and contour graded to provide a

natural appearance and blend with the adjacent landform, and graded areas re-vegetated.

- Trees and shrubs shall be planted at cut/fill transition areas to help screen or soften prominent grade transitions and reduce the artificial appearance of engineered slopes.

- Grading shall utilize techniques such as slope rounding, slope sculpting, and variable gradients to approximate the appearance of natural topography.

Mitigation Measures for light and glare impacts

- Where substantial headlight glare is anticipated to permanently affect residences near new interchanges, landscape screening shall be introduced to block such headlight glare in the shortest time feasible.

- Hardscape surfaces shall avoid highly reflective materials and colors. Where adverse reflective glare is anticipated on soundwalls or other hardscape structures, surface texturing shall be employed to minimize reflectivity, and vines or other vegetation shall be planted to further reduce potential adverse reflective glare.

Mitigation Measures for construction impacts

- Unsightly material and equipment storage and staging shall not be visible within the foreground of the freeway corridor to the extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors.

- Construction, staging and storage areas shall be screened by visually opaque screening wherever they will be exposed to public view for extended periods of time.

- Construction activities shall be phased to minimize the duration of disturbance to the shortest feasible time.

- All areas disturbed by construction, staging and storage shall be re-vegetated.

- Construction Lighting: Construction activities adjacent to residences or businesses shall limit all construction lighting to within the area of work and

avoid light trespass through directional lighting, shielding, and other measures as needed.

3.1.12 Cultural Resources

3.1.12.1 Regulatory Setting

"Cultural resources" refers to all historical and archaeological resources. Laws and regulations dealing with cultural resources are described below.

The National Historic Preservation Act of 1966 (NHPA), as amended, sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) among the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. While the PA does not take the place of the Advisory Council's regulations, 36 CFR 800, it does streamline the Section 106 process by delegating certain responsibilities to Caltrans to allow for a more efficient compliance process for highway projects in California.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties. Notably, Section 4(f) does not apply to archaeological resources that are important chiefly because of what can be learned from data recovery and have minimal value for preservation in place [23 CFR 771.135 (g)(2)].

Historical resources are considered under the CEQA, as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet NRHP listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering,

transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

As defined in the Section 106 regulations, the Area of Potential Effects (APE) means "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects cause by the undertaking" [36 CFR 800.16(d)]. While the CEQA Guidelines do not require delineation of a study area, the APE does take into account all properties with historical resources that may be significantly affected by the project. Properties adjacent to the US 101 corridor are also included in the APE where there may be right-of-way acquisition, temporary construction easements, or soundwalls. Caltrans also consulted historic landmarks lists, which included the National Register of Historic Places, California Register of Historical Resources, California Historical Landmarks, and California Points of Historical Interest.

Public participation and Native American consultation are an essential element of the Section 106 compliance process (36 CFR 800.2). The Native American Heritage Commission (NAHC) was contacted for a search of their sacred lands files and for a list of interested Native American groups and individuals in May 2001 and again in May 2002. Letters were sent to groups and individuals named on the list received from the NAHC on June 5, 2002 to solicit views and information regarding the project. The Federated Indians of Graton Rancheria responded with an interest in obtaining consulting status with Caltrans. The interested parties met with Caltrans regarding potential project-related concerns. In addition, tribal representatives participated in all field work and laboratory studies. Because consultation is an ongoing exchange of views and information, those groups that have expressed an interest would be included in future phases of this project.

3.1.12.2 Affected Environment

For the MSN Project, no properties were identified that meet California Register criteria. Therefore, there is no difference between the compliance methodology for "historic properties" under federal law and "historical resources" under state law. For the purposes of this environmental document, the term "historic

properties" is hereafter used to represent both the federal term "historic properties" and state term "historical resource."

Archaeology

A records and literature search was undertaken to determine the proximity of previously documented prehistoric and historical archaeological resources to the APE and to help establish a context for resource significance. The records of the Northwest Information Center, California Historical Resources Inventory System were consulted and appropriate site records obtained. The record search included the study area and a buffer zone of one mile. An archaeological field reconnaissance of the project area was conducted during 2002 and 2003; additional subsurface testing and evaluation phases were completed in 2005. The entire APE and surrounding study area were surveyed on foot. In those instances where there was high potential for buried deposits not visible on the surface, subsurface augering was undertaken.

In total, eight previously recorded prehistoric sites were identified in the field and five isolated artifacts were found in the survey area, as well as seven historic sites. Three previously recorded sites, CA-MRN 319, MRN-325, and MRN-326, could not be identified in the field. Evaluative studies were undertaken at eight archaeological sites (CA-MRN-192, MRN-194, MRN-195, MRN-196, MRN-197, MRN-327, MRN-507/H, and MRN-526) located within the APE. Based upon subsequent assessments, Caltrans found that five of the sites are clearly eligible for listing in the National Register. These sites, CA-MRN-194, MRN-195, MRN-196, MRN-327, and MRN-526, have demonstrated an expected ability to provide significant information about the past, thus meeting NHPA criteria set forth at 36 CFR 60.4d. Two sites, MRN-197 and MRN-507/H, do not initially appear to have those characteristics that would make them eligible, but limitations to the study precluded clear boundary definition and relationships to nearby deposits. When right-of-way access is acquired, further studies at these locations will be undertaken. The eighth site, CA-MRN-192, does not appear to retain integrity or potential for additional value in understanding regional prehistory.

CA-MRN-192

A large shellmound in both extent and depth was originally located by Nels Nelson, an archaeologist, in 1907. The site was excavated in 1967 due to the impending construction of the freeway. Although the site was listed as destroyed in the past, the current survey located evidence of intact portions of the shell

midden. Limited hand excavation and mechanical trenching indicated that the remaining portion of the site had been highly disturbed. The site does not appear to retain integrity or potential for additional value in understanding regional prehistory. Site MRN-192 is not eligible for listing to the National Register or California Register. The SHPO has concurred with this determination.

CA-MRN-193

Although not within the project APE, the Olompali Village site has been extensively studied in the past and the proximity of the cluster of sites within the APE requires the inclusion of the site in the defined Olompali Complex for the purposes of this assessment. Excavations at the site have recovered a large sample of artifacts, with a temporal range of Middle Archaic to Phase I of the Late Period and intensive protohistoric and historic occupation. The site is predominantly situated on the Burdell Mountain fan, but may descend into the project area along the Burdell Creek drainage. The site is best described as an extensive midden with marine shell, obsidian, chert, and bone, and numerous features including housepits and human burials.

CA-MRN-194

The site is a small shellmound originally recorded by Nelson in 1907. Although the site had been reportedly destroyed, the current survey found the site had been misplotted, but apparently remains intact. Excavation at this site revealed a largely intact, deep, and varied midden representing several periods of occupation. Evaluative testing found that the site retains high research potential and is considered a significant resource and is eligible for listing in the NRHP. The SHPO has concurred with this determination.

CA-MRN-195

Although partially destroyed by previous construction, a large portion of the site remains intact. The site retains good temporal integrity and contains a diverse collection of cultural remains. Evaluative testing found that the site retains high research potential and is considered a significant resource and is eligible for listing in the NRHP due to its ability to provide significant information about the past, thus meeting NHPA criteria set forth at 36 CFR 60.4d. The SHPO has concurred with this determination.

CA-MRN-196

The site includes a deep midden deposit that contains an abundant and varied assemblage of artifacts and subsistence debris. Data sets recovered during the

evaluative testing were among the strongest acquired for the project. Research found that small pockets of intact midden remain within the site boundaries. Evaluative testing found that the site retains high research potential and is considered a significant resource and is eligible for listing in the National Register due to its ability to provide significant information about the past, thus meeting NHPA criteria set forth at 36 CFR 60.4d. The SHPO has concurred with this determination.

CA-MRN-197

This site is a highly disturbed shellmound initially recorded in 1907. The shellmound was reportedly leveled in the 1960s. Although previous survey efforts have located remnants of the midden, the present survey located only sparse artifacts in the vicinity of the site. The site does not appear to retain integrity or potential for additional value in understanding regional prehistory. However, significant areas between MRN-196 and MRN-197 were not studied due to lack of permission to access private property. Full evaluation of the significance of MRN-197 and its relationship to the boundaries of MRN-196 will be conducted if right-of-way acquisition becomes necessary.

CA-MRN-327

This site, a nearly complete, marginally disturbed shellmound, was originally recorded in 1907 as an elongated mound with considerable depth. Evaluative testing results revealed strong implications for economic/sociopolitical organization and ethnic identity. The site retains high research potential and is considered a significant resource and is eligible for listing in the National Register due to its ability to provide significant information about the past, thus meeting NHPA criteria set forth at 36 CFR 60.4d. The SHPO has concurred with this determination.

CA-MRN-507/H

This site, a sparse lithic scatter with low density, demonstrates high disturbance due to previous land use activities. The site does not appear to retain integrity within the APE limits and does not appear to hold potential for additional value in understanding regional prehistory. However, because of the proximity of MRN-507/H to other significant resources and the potential for associated buried deposits, full evaluation of the site will be conducted if right-of-way acquisition becomes necessary.

CA-MRN-526

This site is a complex deposit containing multiple pockets of archaeological remains spread across a large area. Portions of the site may be among the oldest documented components in Marin County. Although the recovered material from the site is not extensive, it does exhibit a long period of occupation with large variability in settlement and technological organization. The site retains high research potential and is considered a significant resource and is eligible for listing in the National Register due to its ability to provide significant information about the past, thus meeting NHPA criteria set forth at 36 CFR 60.4d. SHPO has concurred with this determination.

CA-MRN-325 and CA-MRN-326

These sites could not be located and were not formally assessed as part of the project. They are presumed to have been destroyed by previous construction of US 101.

Olompali and San Antonio Clusters

An apparent clustering of archaeological sites at two locations, one within Olompali SHP (CA-MRN-194, 195, 507/H and 526) and the other at San Antonio Creek (CA-MRN-196 and MRN-197), suggests that their boundaries may not have been fully evaluated due to limited access, and thus determination of eligibility for all of the sites may require further studies.

In a letter received from the SHPO dated April 22, 2006, in response to the Determination of Eligibility within the Historic Property Survey Report documentation, the SHPO requested that, until further studies can be conducted to determine site boundaries and evaluate eligibility for National Register listing, all sites within the Olompali and San Antonio Creek clusters be considered eligible, with the addition of CA-MRN-193, the Olompali Village site. Although not within the defined APE, the proximity of CA-MRN-193 to the Olompali Complex necessitates its inclusion in the evaluation of project effects.

Architectural History

The APE for this project includes 17 properties that were built in 1955 or earlier and were evaluated in the Historic Resources Evaluation Report (HRER).

Of the 17 properties evaluated in the HRER, one is eligible for National Register listing: the Freeman-Parker residence, south of Petaluma in Sonoma County. This residence, built ca. 1854, is a rare, intact example of a vernacular residence from

the first decade of California statehood and qualifies for the National Register under Criterion C. The SHPO has concurred with this determination. The historic property boundary is the fenced yard immediately surrounding the house, and does not extend to the barns and garages on the large 99.76-ac parcel. US 101 abuts the western edge of the historic property boundary as the Freeman-Parker Residence currently has direct access to the highway from a private driveway.

A second property within the APE, Olompali SHP, is listed in the National Register of Historic Places. Olompali's built resources are located above the highway on the hillside, surrounded by mature tree growth. Currently, the existing highway is barely visible from the pedestrian level in the immediate vicinity of the built resources.

A third property, the San Antonio Road Bridge over San Antonio Creek (Bridge 27C0051) was previously determined eligible for listing in the National Register of Historic Places as a part of Caltrans' Statewide Historic Bridge Survey of 1986. Built in 1917, this bridge is one of the earliest concrete T-beam bridges constructed by the California Division of Highways. It retains a high degree of integrity and remains eligible for the National Register. There are 38 bridges within the project APE. Seventeen of these were built before 1960 and therefore were included in the recent Statewide Historic Bridge Inventory Update of 2002-04. Excluding the historic San Antonio Road Bridge, none of the bridges within the project APE are eligible for the National Register.

The properties within the APE for this project were also evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code. Three properties are considered historical resources for the purpose of compliance with CEQA: Olompali SHP, the San Antonio Road Bridge, and the Freeman-Parker Residence.

3.1.12.3 Impacts

To comply with Section 106 of the NHPA, Caltrans must assess effects on any properties listed or eligible for the NRHP by applying the Criteria of Adverse Effect [36 CFR 800.5(a)]. An Adverse Effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials,

workmanship, feeling or association. This includes physical destruction of or damage to all or part of a property.

Archaeology

Fixed HOV Lane Alternative. Caltrans, in consultation with the SHPO, has found that five archeological sites within the APE, CA-MRN-194, MRN-195, MRN-196, MRN-327, and MRN-526, satisfy NRHP eligibility criteria set forth at 36 CFR 60.4d and would be adversely affected by construction of the Fixed HOV Lane Alternative. Two sites, MRN-197 and MRN-507/H do not initially appear to have those characteristics that would make them eligible, but limitation to the study precluded clear boundary definition and relationships to nearby deposits. Construction of the Fixed HOV Lane Alternative would have an adverse effect on the two site complexes in the APE. The Olompali Complex would be entirely or partly destroyed by construction of the project. The second complex of sites at the San Antonio Creek Bridge (MRN-196, MRN-197) would also be entirely or partially destroyed by removal of the bridge and/or construction of access roads.

CA-MRN-327 is not presently in the area of direct impact, so that the effect to this site may not be adverse if it is protected during construction.

Section 4(f) applies to all archaeological sites that are on or eligible for inclusion on the National Register and that warrant preservation in place. This includes those sites discovered during construction. Section 4(f) does not apply if FHWA, after consultation with SHPO and/or THPO, determines that the archaeological resource is important chiefly because of what can be learned by data recovery (even if it is agreed not to recover the resource) and has minimal value for preservation in place](23 CFR 771-135 (g)]. Based upon SHPO's concurrence with FHWA and Caltrans that the archaeological sites are eligible under Criterion D (see letters from SHPO in Appendix D), the archeological sites discussed here are exempt from the Department of Transportation Act, 1966.

Reversible HOV Lane Alternative. Because the Reversible HOV Lane Alternative would have the same footprint as the Fixed HOV Lane Alternative, the impacts identified above for the Fixed HOV Lane Alternative would also apply to the Reversible HOV Lane Alternative. Accordingly, this alternative would have an adverse effect on two site complexes around Olompali and the San Antonio Creek Bridge.

Access Option. The Access Options involve repaving existing roads, constructing new frontage roads with bicycle and pedestrian facilities, replacement and modified bridgework, and new interchanges. The areas of potential disturbance in undeveloped areas are fairly similar for Access Options 4b, 14b, and 14d. Access Option 12b would not include a San Antonio Road Interchange or any frontage road on the east side of US 101 between the Redwood Landfill Overcrossing and San Antonio Creek. As a result, the potential to affect archaeological resources would be similar for three of the Access Options and less with Access Option 12b.

No Build Alternative. Under the No Build Alternative, there would be no impacts to archaeological resources, because this alternative would involve only routine maintenance and upkeep of US 101 and there would be no direct or indirect change to the properties identified as eligible for, or listed in, the National Register.

Architectural History

Fixed HOV Lane Alternative. There are three historic properties, all occurring within the Segment B. There would be no direct or indirect adverse effects to these resources. Consequently, a 4(f) evaluation is not necessary under the Department of Transportation Act of 1966 (49 U.S.C. 303). The historic properties are described below.

Olompali SHP. The centerline of the proposed freeway would be moved further to the east in the vicinity of the park, away from the park boundary. While work is proposed at the driveway entrance to the park to realign the park road access, this entrance is contemporary and the proposed work would not enlarge the entrance or directly impact any historic architectural resources. The proposed freeway would not be any more visible from the buildings at the park. The changes to the surrounding landscape (outside the boundary of the park) would be visible from the visitor parking area and from the grounds closer to the US 101 corridor; however, this setting is not a contributing feature to the park because the highway in its current form was existing at the time of the National Register listing of Olompali in January 1973. Therefore, Caltrans has found, and SHPO has concurred, that the MSN Project would not have an adverse effect on Olompali SHP.

San Antonio Road (Bridge No. 27C0051). The Fixed HOV Lane Alternative would construct a new bridge to the west of the San Antonio Road Bridge to serve two-way vehicular access across San Antonio Creek. The existing historic bridge would be retained as is for vehicular and bicycle/pedestrian access. No rehabilitation of the bridge is planned at this time. Concrete bollards may be placed on San Antonio Road immediately north and south of the bridge to prevent vehicular crossing. No changes are proposed to the existing bridge itself. While the setting of the bridge would be modified with the addition of a new bridge upstream, the immediate surroundings of San Antonio Road Bridge would not change to a significant degree. Significant for its early concrete T-beam construction, the bridge's character-defining construction, materials, and design would be retained. The bridge would still be able to convey those features which are integral to its National Register significance. The proposed construction of a new bridge and the proposed work to widen the shoulders of the existing San Antonio Road as part of the Fixed HOV Lane Alternative would not diminish nor adversely affect the bridge's character-defining features. Therefore, Caltrans has found, and SHPO has concurred, that the project would not have an adverse effect on the bridge.

Freeman-Parker Residence, 4555 Redwood Highway, Petaluma. The Fixed HOV Lane Alternative would shift US 101 to the west in the vicinity of this historic property. An access road is proposed in the existing footprint of the northbound lanes, and right-of-way acquisition on the western side of the existing roadway to shift the freeway's centerline west, away from the Freeman-Parker Residence. The driveway to the residence would be rebuilt to provide access to the proposed frontage road. However, there would be no property take from the Freeman-Parker Residence, the proposed driveway would be constructed on existing state right-of-way and connect to the internal access road within the large rural parcel. While access to the residence would be modified under the Fixed HOV Lane Alternative, the proposed construction near the Freeman-Parker Residence would not diminish nor adversely affect the property's character-defining features. The residence's integrity would be retained; the alteration of the property's setting by the proposed construction would not a significant effect since the setting was previously significantly altered when the highway was first upgrade in the middle of the last century. Therefore, Caltrans has found, and SHPO has concurred, that the Fixed HOV Lane Alternative would not have an adverse effect on the Freeman-Parker Residence.

Reversible HOV Lane Alternative. Because the Reversible HOV Lane Alternative would have the same footprint as the Fixed HOV Lane Alternative, the impacts to the Olompali SHP, the San Antonio Road Bridge, and the Freeman-Parker residence identified above for the Fixed HOV Lane Alternative would also apply to the Reversible HOV Lane Alternative. Accordingly, this alternative would not have adverse effect on historic properties.

Access Options. The improvements in the vicinity of the three historic properties are identical under all the Access Options. The impacts to these properties are identified above under the discussion of the Build Alternatives. SHPO has concurred with Caltrans that there would not be an adverse effect on the three historic properties.

No Build Alternative. Under the No Build Alternative, there would be no effects to architectural history resources, because there would be no change to the three properties identified as eligible for, or listed in, the National Register and there would be no change to the setting of these properties.

3.1.12.4 Avoidance, Minimization, and/or Mitigation Measures

Archaeology

Caltrans' project development process involved modifications to the Build Alternatives to avoid and minimize project-related impacts to cultural resources in consultation with professionally qualified staff, SHPO and the Federated Indians of Graton Rancheria. Consequently, excavation of archaeological sites was minimized and testing for buried deposits was constrained in order to reduce impacts to the subject archaeological sites. Nevertheless, total avoidance of archaeological resources is not achievable because of the scale of the proposed construction, tight grade areas, and turning constraints.

Implementing the mitigation measures stipulated below will be necessary for both Build Alternatives and will comply with Section 106 regulations regarding assessment and treatment of known historic properties as well as assessment and treatment of potential subsequent historic properties discoveries during the project.

Memorandum of Agreement to Protect Archaeological Resources. To resolve adverse effects of the proposed project on the archaeological sites, FHWA and Caltrans has consulted with the SHPO and interested Native American groups. A

Memorandum of Agreement (MOA) has been developed to identify mechanisms for treatment of historic properties, primarily through recovery of significant data that would be destroyed by construction of the project (Appendix D). The MOA will also outline the process for finishing identification of subsurface contexts that might contain historic properties that might be affected by the project and will also outline procedures for treatment of historic properties inadvertently discovered during construction. To protect sites not in the area of direct construction impacts, a provision for archaeological monitoring during construction will be stipulated. Under this MOA, a Historic Property Treatment Plan (Treatment Plan) will be prepared for the project prior to construction. The Treatment Plan will be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation. Interested Native Americans will be invited to participate in the development of the Treatment Plan.

Architectural History

The finding for the three architectural historic resources in the APE is that no adverse effect would occur as a result of the MSN Project. Therefore, as no physical alteration would occur, no mitigation is proposed for any of these resources.

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact District 4 Environmental Branch, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.