Eureka – Arcata Route 101
Corridor Improvement Project

Draft Environmental Impact Statement
Environmental Impact Report

01-Hum-101-KP 128.6/138.9 (PM 79.9/86.3)
EA 01 – 366000, 363300

Prepared by the U.S. Department of Transportation
Federal Highway Administration (FHWA) and the
State of California Department of Transportation (Caltrans)
For the Humboldt County Association of Governments (HCAOG)

Caltrans Metric

FHWA

HCAOG

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General Information About This Document

What's in this document?

This document is a Draft Environmental Impact Report/Statement (Draft EIR/S) that examines the potential environmental impacts of project alternatives for the proposed Eureka - Arcata Route 101 Corridor Improvement project located in Humboldt County, California. This document was prepared by the California Department of Transportation (Caltrans) under the review of the Federal Highway Administration (FHWA) for the Humboldt County Association of Governments (HCAOG). HCAOG is a Joint Powers Agency comprised of the seven incorporated cities (Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell, and Trinidad), and the County of Humboldt. The agency is largely responsible for programming State highway public transportation resources in Humboldt County. The document describes why the project has been proposed, potential effects from each of the alternatives, and proposed measures to minimize harm.

If you're interested, you may:

- Review this Draft EIR/S.
- Your comments are welcome. If you have any concerns regarding the proposed project, please attend the Public Information Meeting and/or send your written comments to Caltrans by the deadline indicated below. Submit comments via regular mail to Rod Parsons, Chief, Environmental Branch E-1, California Department of Transportation, P.O. Box 3700, Eureka, CA 95502 – 3700.
- Submit comments by the deadline: August 24, 2007.

What happens after this?

After comments are received from the public and reviewing agencies, Caltrans and the FHWA may undertake additional environmental and/or engineering studies. A Final EIR/S will be circulated; the Final EIR/S will include responses to comments received on the Draft EIR/S and will identify the preferred alternative. Following circulation of the Final EIR/S, if the decision is made to approve the project, a Notice of Determination will be published for compliance with the California Environmental Quality Act and a Record of Decision will be published for compliance with the National Environmental Policy Act. If the project is given environmental approval and funding is appropriated, the Department could design and construct all or part of the project.

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Rod Parsons, Chief, Environmental Branch, California Department of Transportation, P. O. Box 3700, Eureka, CA 95502; 707-445-7815 Voice, or use California Relay Service, 1(800) 735-2929 (Voice) or 711.

Note that at a future date FHWA or another Federal Agency may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that a final action has been taken on this project by FHWA or another Federal agency. If such notice is published, a lawsuit or other legal claim will be barred unless it is filed within 180 days after the date of publication of the notice (or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed). If no notice is published, then the lawsuit or claim can be filed as long as the periods of time provided by other Federal laws that govern claims are met.

Report Number: FHWA-CA-DEIS

SCH Number: 2001092035
01-Hum-101
KP 128.6/138.9 (PM 79.9/86.3)
EA 01-366000, 363300

Eureka - Arcata Route 101 Corridor Improvement Project
In Humboldt County, California from KP 128.6/138.9 (PM 79.9/86.3)
Draft Environmental Impact Statement / Environmental Impact Report

Submitted Pursuant to:
National Environmental Policy Act, 42 U.S.C. 4332 (2)(c), 49 U.S.C. 303 and the
California Environmental Quality Act, Div. 13, Public Resources Code by the U.S. Department of Transportation-
Federal Highway Administration and the State of California Department of Transportation

6/15/07
Charles C. Fielder, District 1 Director
California Department of Transportation
Date

6/20/07
Gene K. Fong, Division Administrator
Federal Highway Administration
Date

The following persons may be contacted for additional information concerning this document:

Mitchell Higa
Environmental Management Branch
California Department of Transportation – District 1
P. O. Box 3700, Eureka, CA 95502 – 3700
707-445-7815

Maiser Khaled, Director
Project Development & Environmental
Federal Highway Administration
650 Capitol Mall, Suite 4-100
Sacramento, CA 95814
916-498-5020

Abstract

The proposed Eureka to Arcata Route 101 Corridor Improvement Project consists of various improvements on Route 101 between the Eureka Slough Bridge and 11th Street overcrossing in Arcata. Major project features may include closing roadway median crossings, constructing an interchange at Indianola Cutoff, replacing or widening Jacoby Creek and Gannon Slough Bridges, and realigning and signalizing the Route 101/Airport Road intersection. The purpose of the project is to improve safety; reduce operational conflicts and delay; rehabilitate roadway to meet current traffic engineering design standards as feasible; and extend the pavement service life of the roadway in the Route 101 corridor between Eureka and Arcata. Three Build Alternatives and a No-Build Alternative are evaluated in this Draft EIR/S. The proposed project could affect traffic circulation, wetlands, listed fish species, water quality, and visual resources. Mitigation is being proposed to reduce potential project impacts. **Comments on this document are due by August 24, 2007** and should be sent to Kim Floyd, Project Manager, California Department of Transportation, P. O. Box 3700, Eureka, CA 95502 – 3700.

Summary

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA and the FHWA is lead agency under NEPA. Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA.

After comments are received from the public and reviewing agencies, Caltrans and FHWA may undertake additional environmental and/or engineering studies. A Final EIR/S will be circulated; the Final EIR/S will include responses to comments received on the Draft EIR/S and will identify the preferred alternative. Following circulation of the Final EIR/S, if the decision is made to approve the project, a Notice of Determination will be published for compliance with the California Environmental Quality Act and a Record of Decision will be published for compliance with the National Environmental Policy Act.

The following summary identifies major items of importance to decision-makers regarding the proposed project. Detailed project information is presented in the body of this document.

Proposed Project

Caltrans and FHWA propose to make improvements to Route 101 between the Eureka Slough Bridge in Eureka and the 11th Street overcrossing in Arcata, kilometer post 128.6 to 138.9 (post mile 79.9 to 86.3), in Humboldt County. See Figure S-1, Project Location Map. The proposed action would improve safety and reduce operational conflicts and traffic delays at Route 101 intersections between Eureka and Arcata by:

- Eliminating uncontrolled Route 101 crossing movements;
- Extending or constructing right-turn acceleration and deceleration lanes;
- Eliminating left-turns and left merge traffic movements.

Major project features may also include constructing a Route 101/Indianola Cutoff interchange; realigning and signalizing Airport Road at Route 101; constructing an additional lane from the existing Cole Avenue acceleration lane to the Mid-City Motor World entrance; widening the northbound Jacoby Creek and Gannon Slough Bridges; and replacing the southbound Jacoby Creek Bridge. The project alternatives are described in detail in Chapter 2.

Project Need and Purpose

The project is needed to address the following concerns:

- Uncontrolled vehicle crossing movements at median openings, which has led to past high collision rates as compared to similar facilities and predicted future collisions at access roads within the Route 101 corridor.

- Left-turn/left-merge movements at intersections: left-side ramps (allowing vehicles to enter the roadway from the left side) are contrary to what drivers expect and tend to have much higher collision rates than that of right-side highway exits and entrances. Collision analysis has shown that three times as many rear-end, sideswipe, and overturned vehicle collisions occurred in the left lane as occurred in the right lane.

- Increased delays for turning and merge movements at intersecting access points within the corridor.

- The existing Route 101/255 interchange ramps and acceleration/deceleration lanes within the project limits do not meet current design standards; the pavement is also deteriorating.

- Objects within the roadway clear recovery zone*; the existing bridge rails are non-standard; overhead roadway lighting needs to be relocated/replaced to conform to current highway design standards; and the existing tide gates adjacent to the roadway are deteriorating.

The purpose of the project consists of the following:

- Improve safety at intersections;

- Reduce left-turns and left-merge on and off traffic vehicle movements at median crossings within the Route 101 Corridor. These movements can lead to driver confusion and therefore increase collisions.

- Reduce delay at intersections; and

- Resurface, restore, and rehabilitate the existing Route 101.

Project Alternatives

There are three Build Alternatives and one no-build alternative evaluated in this document:

Alternative 1 - Resurface, restore, and rehabilitate (RRR) with median closures.

This alternative consists of the following:

1) Extend or establish right-side acceleration lanes and deceleration lanes at Cole Avenue, Mid-City Motor World, the Simpson sawmill, Indianola Cutoff, Bracut, and Bayside Cutoff. Close all remaining Route 101 median crossings at the following Route 101 intersections: Airport Road, Mid-City Motor World, Simpson sawmill, Indianola Cutoff, Bracut, and Bayside Cutoff.

2) Install thrie-beam median safety barrier and a 1.5-meter (five-feet) wide asphalt-concrete paved weed barrier within the Route 101 median between the Eureka Slough bridges and Airport Road.

3) Replace the existing curb and asphalt-concrete shoulder with 2.4-meter (eight-feet) wide paved shoulders at ramps at the Route 101/255 interchange and South G Street.

4) Place asphalt-concrete overlay from Eureka Slough Bridge to 11th Street in Arcata. Place shoulder backing, a minimum of one-meter or three-feet wide, adjacent to the paved surfaces.

5) Replace the southbound Route 101 Jacoby Creek Bridge.

6) Widen the Route 101 northbound Jacoby Creek and Gannon Slough Bridges to maintain the minimum width of 1.5-meter (five-feet) left shoulder, two 3.6-meter (12-feet) wide lanes and 3.0-meter (ten-feet) right shoulder; install standard bridge rail on all bridges to be widened or replaced, with a bicycle railing installed on the outside barriers. Bridge rail used shall be consistent on all three bridges.

7) Replace all existing tide gates adjacent to the Route 101 roadway within the project limits.

8) Add or replace roadway lighting on mainline Route 101 at Cole Avenue, Indianola Cutoff, Bracut, Bayside Cutoff, South G Street, and the Route 101/255 Interchange. New electrical conduit would be installed between the lights.

9) Install metal beam guard railing with standard end treatments at three billboards adjacent to the southbound Route 101 lane south of Bracut to protect errant vehicles from striking the billboards. (The existing billboards are outside of the existing state highway right-of-way, but are within the nine-meter (thirty-feet) clear recovery zone.)

10) Remove existing trees within the corridor that are within the nine-meter (thirty-feet) clear recovery zone. See Section 1.2 in Chapter 1 for more information regarding the clear recovery zone.

11) Replace thrie-beam median traffic barrier on Route 101 with median paving and a concrete safety barrier from South G Street to the 11th Street overcrossing in Arcata.

12) Remove Safety Corridor signage within the Safety Corridor (KP 128.6/136.0 or PM 79.9/84.5), and increase the posted speed limit to 65 mph north of Mid-City Motor World.

Alternative 2 - RRR Project with median closures and interchange at Indianola Cutoff

Alternative 2 includes all of the elements of Alternative 1 with the exception that the work associated with Indianola Cutoff would be replaced with the construction of a compact diamond interchange with an Indianola Cutoff under-crossing.

Install roadway lighting at exit and entrance ramps as well as the intersections of the ramps with Indianola Cutoff. The electrical service for the lighting would likely be at the intersection of the Indianola Cutoff and the northbound ramps; and the conduit would be trenched from the service location to the lights.

Alternative 3 - RRR Project With Median Closures and Interchange at Indianola Cutoff and Signalized Intersection at Airport Road

Alternative 3 includes all of the elements of Alternative 2 with the exception that the work associated with Airport Road would need to be replaced with the construction of a signalized intersection.

Alternative 3 requires realigning the Airport Road intersection because of the close proximity of the intersections of the existing Airport Road/Route 101 intersection and Airport Road/Jacobs Avenue intersection. Airport Road would need to be realigned outside of the existing State right-of-way across the end of an abandoned runway of the Murray Field Airport, and across the existing ditch east of northbound Route 101 to a new intersection location on Route 101.

An additional continuous northbound lane would be constructed from Cole Avenue to Mid-City Motor World to minimize traffic queuing on Route 101 from signalizing Route 101 at Airport Road. (The additional lane would eliminate the need for extending the existing acceleration and deceleration lanes.) A retaining wall on the east side of Route 101 would be required for a portion of the distance between Cole Avenue and Airport Road, to avoid placing fill on the existing slope to minimize impacts to wetlands and existing drainage patterns. The widening for the additional lane north of the intersection

with Airport Road would occur within the Route 101 median to avoid any further encroachment into the airport's flight approach/departure (air space) surface. Route 101 would continue to have two northbound through lanes north of Mid-City Motor World. Southbound Route 101 would remain unchanged except the left-turn lane at Airport Road would be modified to conform to the realigned intersection.

The operation of the proposed realigned Airport Road intersection at Route 101 would allow for U-turns by truck traffic and passenger vehicles from southbound Route 101 to northbound Route 101. Passenger vehicles, but not truck traffic, would be allowed to make the U-turn movement from either direction at the Airport Intersection.

When simply comparing the current Route 101 frequency of collision rates to the Statewide average on similar facilities, the safety component of the project Need and Purpose would not be met with new traffic signalization alone. However, collision rates at signalized intersections can be reduced with the addition of carefully-planned and appropriately designed safety countermeasures. Features such as Intelligent Transportation System or ITS technology (e.g. electronic warning message signage) and Red Light Run Photo Enforcement, if supported and funded by the City of Eureka, are examples of safety countermeasures that would be considered. Red Light Run Photo Enforcement has proven effective at improving driver compliance with traffic control devices (Source: Report 500 National Cooperative Highway Research Program, Volume 12: A Guide for Reducing Collisions at Signalized Intersections.)

Alternative 7 – No-Build

Alternative 7 is the No-Build Alternative. This alternative retains the current roadway alignment and access, including median openings. The No-Build Alternative would propose no modifications to the existing alignment or access for this project. The existing posted speed limit of 50 mph, flashing warning lights, daytime headlight and reduced speed signs would remain. Other projects to maintain/rehabilitate the road surfaces, drainage improvements, bridge retrofit or widening projects or other safety-related projects would continue on a case-by-case basis. The No-Build Alternative does not satisfy the Need and Purpose for the project.

Summary of Major Project Effects/Impacts and Mitigation/Measures to Avoid Harm

The following is a summary to aid the reader in evaluating/quantifying the potential impacts of each alternative on the various resources, followed by a summary table. For a detailed discussion, refer to Chapter 3 of this document.

Wetland Impacts. The project could permanently fill 1.57 hectares (3.89 acres) up to 6.24 hectares (15.41 acres) of wetland, depending on the alternative. A conceptual

mitigation plan for this project includes proposals to mitigate for both temporary and permanent wetland impacts.

Potential Impacts to Listed, Threatened, or Endangered Species. Without mitigation, the tidewater goby and salmonid species could be adversely affected during bridge construction work and at tidal gates. Working with resource agencies, a biological assessment will be prepared which will include measures to avoid and minimize harm to listed species during construction.

Social and Economic Impacts. Closing Route 101 median openings at local intersections would create out-of-direction travel for residents and businesses along the Route 101 corridor between Eureka and Arcata. Alternative 2, which includes an interchange, and Alternative 3, which adds signalization at Airport Road in addition to an interchange, would help to minimize out-of-direction travel created by median closures.

Aesthetic impacts. Approximately 300 mature, non-native eucalyptus trees on the bay side of Route 101 and approximately 100 mature trees (various species) in the nine-meter (thirty-feet) clear recovery area on the east side of Route 101 would be removed for Alternative 1. Alternatives 2 and 3, which include an interchange at Indianola Cutoff, would require removing an additional 25-50 eucalyptus trees. A tree management plan for this project includes proposals to minimize tree removal and replant suitable native vegetation.

Summary of Potential Environmental Impacts

Environmental Consequence	Potential Project Effect After Avoidance and Implementation of Measures to Minimize Harm/Mitigation			
	Alternative 1	**Alternative 2**	**Alternative 3**	**No-Build Alternative**
Route 101 Corridor Business Access	Substantial	Moderate	Minor to moderate	Moderate [1]
Affect on local roads	Substantial	Moderate	Minor to moderate	Moderate [1]
Listed, Threatened, Endangered Species	Minor	Minor	Minor	No effect
Environmental Justice	Substantial	Moderate to substantial	Minor	Moderate [1]
Energy: Year 2031 Vehicle fuel increase (+) or decrease (-) compared to the existing condition in liters (gallons) per day	+ 3,305 (+ 873)	+ 1,483 (+ 392)	- 605 (- 160)	Moderate [1]
Out of direction travel/ delay resulting from Route 101 median access closures	Substantial	Moderate to substantial	Minor	Moderate [1]
Air quality	Minor	Minor	Minor	No effect
Noise	Minor	Minor	Minor	No effect [1]
Hazardous Waste	Minor	Minor	Minor	No effect
Water quality during construction	Minor	Minor	Minor	No effect
Total permanent wetland impact [2]	1.57 hectares (3.89 acres)	5.36 hectares (13.25 acres)	6.24 hectares (15.41 acres)	0
Increase in Floodplain	Minor	Minor	Minor	No effect
Cultural resources [2]	No effect	No effect	No effect	No effect
Tree Removal, Visual Quality	Moderate to substantial	Moderate to substantial	Moderate to substantial	No effect
Traffic during construction	Minor	Minor	Minor	No effect
Growth inducement	No effect	Low probability	Minor	No effect [1]

[1] Even though the No-Build Alternative does not include any proposed roadway changes, traffic volumes and speeds are expected to increase in the foreseeable future, which will likely necessitate closing one or more Route 101 median openings within the corridor. Closing one or more medians could potentially restrict access to businesses and residents; add out-of-direction travel and delay; increase fuel consumption; and, adversely affect the Level-of-Service of local streets as well as State Route 255.

In addition, without improvements, left-turn movements onto Route 101 are predicted to degrade to Level-of-Service F in the year 2031 at the following Route 101 intersections: Airport Road, Mid-City Motor World, Simpson Mill, Indianola Cutoff, Bracut, and Bayside Cutoff.

[2] Route 101 access restrictions could result in an increase in out-of-direction vehicle travel, which could adversely affect local roads; one or more local roads may then require improvements that could potentially affect wetlands and cultural resources impacts.

Coordination with Public and Other Agencies

The Federal Highway Administration (FHWA), the U.S. Army Corps of Engineers (USACE), and the U.S. Environmental Protection Agency (EPA) have adopted an agency policy to improve interagency coordination and to integrate the National Environmental Policy Act (NEPA) and Clean Water Act Section 404 procedures. Pursuant to these procedures, the Eureka-Arcata Corridor Improvement Project requires consultation with the USACE, EPA, U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration - Fisheries (NOAAF). See Appendix E for more information. Caltrans and FHWA have been coordinating and will continue to coordinate with the resource agencies through meetings and the NEPA-404 Integration process.

Issues to be resolved and processes to be completed in Coordination with Public and Other Agencies before implementation of the Corridor Improvement Project:

- Identification of the Least Environmentally Damaging Practicable Alternative (LEDPA) that meets the project Need and Purpose.
- Wetland mitigation
- Tree replacement measures
- Invasive species management
- Endangered Species Act - Section 7 Consultation to avoid or minimize impacts to listed Threatened or Endangered Species.
- Final project design
- Utility relocation
- Permits and approvals
- Develop cultural resource monitoring plan

Required approvals and permits

Both Caltrans and FHWA must approve the completion of this environmental document in accordance with CEQA and NEPA guidelines and regulations. The environmental documentation process involves coordinating with other public local, regional, state and federal agencies. Following public review of this Draft EIR/S and consideration of comments, a preferred alternative would be identified. The preferred alternative and responses to public comments will be included in the final EIR/S. Upon certification of the Final EIR by Caltrans and approval of the Final EIS by FHWA, Caltrans would file a Notice of Determination (NOD) with the State Clearinghouse that CEQA review has been completed for this project. In compliance with CEQA, Caltrans will prepare a Statement of Overriding Considerations if the proposed project results in one or more unavoidable significant environmental impacts. FHWA would prepare and file a Record of Decision (ROD) describing why the preferred alternative was selected.

Regulatory permits

The following separate regulatory approvals must be issued before construction can commence:

Section 404 Individual Permit. Implementation of the Corridor Improvement Project could result in the filling of wetlands and other Waters of the United States. The U.S. Army Corps of Engineers (USACE) regulates the Nation's waterways and wetlands, and is responsible for implementing and enforcing Section 404 of the federal Clean Water Act (CWA). USACE regulations require that any activity that discharges material or requires excavation in "Waters of the United States," including wetlands, must obtain an Individual Section 404 permit for projects that would permanently fill more than 0.2-hectare (0.5-acre).

Section 10 of the Rivers and Harbors Act Permit. This project may require a Section 10 permit from the USACE for the construction of any structure in or over any navigable water of the United States, the excavating from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters.

General Bridge Act of 1946. This law requires the U.S. Coast Guard to approve the location and plans of bridges prior to start of construction (33 U.S.C. 525).

Section 401 Water Quality Certification. The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB) promulgate and enforce narrative and numeric water quality standards in order to protect water quality and adopt and approve Water Quality Control Plans. The SWRCB and the RWQCBs also regulate discharges of pollutants to surface waters, including wetlands, under the federal CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne). If issuance of a Section 404 permit is required, it will be subject to water quality certification under CWA Section 401.

Waste Discharge Requirements. Under the Porter-Cologne Act, the RWQCBs regulate the discharge of "waste" into "waters of the state." Water Code Section 13260 requires "any person discharging, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge." A report of waste discharge (RWD) is essentially an application for waste discharge requirements (WDRs). WDRs contain conditions imposed on a given discharge by the appropriate RWQCB to protect the beneficial uses of the waters of the State.

Section 7 Consultation. The Federal Endangered Species Act requires a federal agency to consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration - Fisheries (NOAAF) for species listed as Threatened or Endangered, or proposed for listing as Threatened or Endangered. Based on this consultation, the USFWS or NOAAF issues a biological opinion determining whether the

project is likely to adversely affect or jeopardize the continued existence of a federally listed species, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species.

Essential Fish Habitat. The 1996 amendments to the Magnuson-Stevens Act set forth a number of new mandates for the National Oceanic and Atmospheric Administration - Fisheries (NOAAF), eight regional fishery management councils (Councils), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NOAAF, are required to delineate Essential Fish Habitat (EFH) for all managed species. Federal agencies, which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NOAAF regarding the potential effects of their actions on EFH, and are required to respond in writing to NOAAF recommendations. The proposed project is located within an area designated as EFH for Pacific Salmon.

Section 106 Compliance. For projects with federal funding, the National Historic Preservation Act of 1966 (NHPA), as amended by 16 United States Code (USC) Section 470 et seq.; Section 106; 36 Code of Federal Regulations (CFR) 800, includes provisions for protection of significant archaeological and historical resources. Procedures for dealing with previously unsuspected cultural resources discovered during construction are identified in 36 CFR 800 (for implementing Section 106 processes). The administering agency is the State Historic Preservation Officer (SHPO) and the federal lead agency FHWA.

NPDES Permit. The National Pollutant Discharge Elimination System (NPDES) permit system was established in the CWA to regulate municipal and industrial discharges to surface Waters of the U.S. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that the Environmental Protection Agency (EPA) must consider in setting effluent limits for priority pollutants.

California Coastal Commission Coastal Development Permit. All development in the Coastal Zone requires either a Coastal Development Permit or an exemption from Coastal Permit requirements. In order to obtain a permit, the development proposal must comply with the policies of the certified Local Coastal Program (LCP) and the State Coastal Zone Management Program (CZMP). The California Coastal Commission (CCC) reviews federal assistance activities within or affecting the Coastal Zone to make a determination regarding its consistency with the CZMP.

California Department of Fish and Game 1602 Streambed Alteration Agreement. Section 1602 of the California Fish and Game Code requires a Stream Alteration Agreement from the California Department of Fish and Game (CDFG) for activities that would divert, obstruct or change the natural flow or adversely affect the bed, channel or bank of a stream and its associated fish and wildlife values, including contiguous riparian habitat.

California Department of Fish and Game Consistency Determination. A California Endangered Species Act (CESA) consistency determination may also be required for the Coho salmon.

Humboldt Bay Harbor Recreation and Conservation District. A permit from this agency is required for bridge construction work at Jacoby Creek and Gannon Slough.

Other Permits and Approvals. Other federal, state, and local agencies' permits and approvals including, but not limited to the following, may be needed for project implementation:

State Lands Commission permit
State Department of Toxic Substances Control
County of Humboldt Coastal Development Permit
City of Arcata Coastal Development Permit
Air Quality Permit
Local city/county encroachment permits

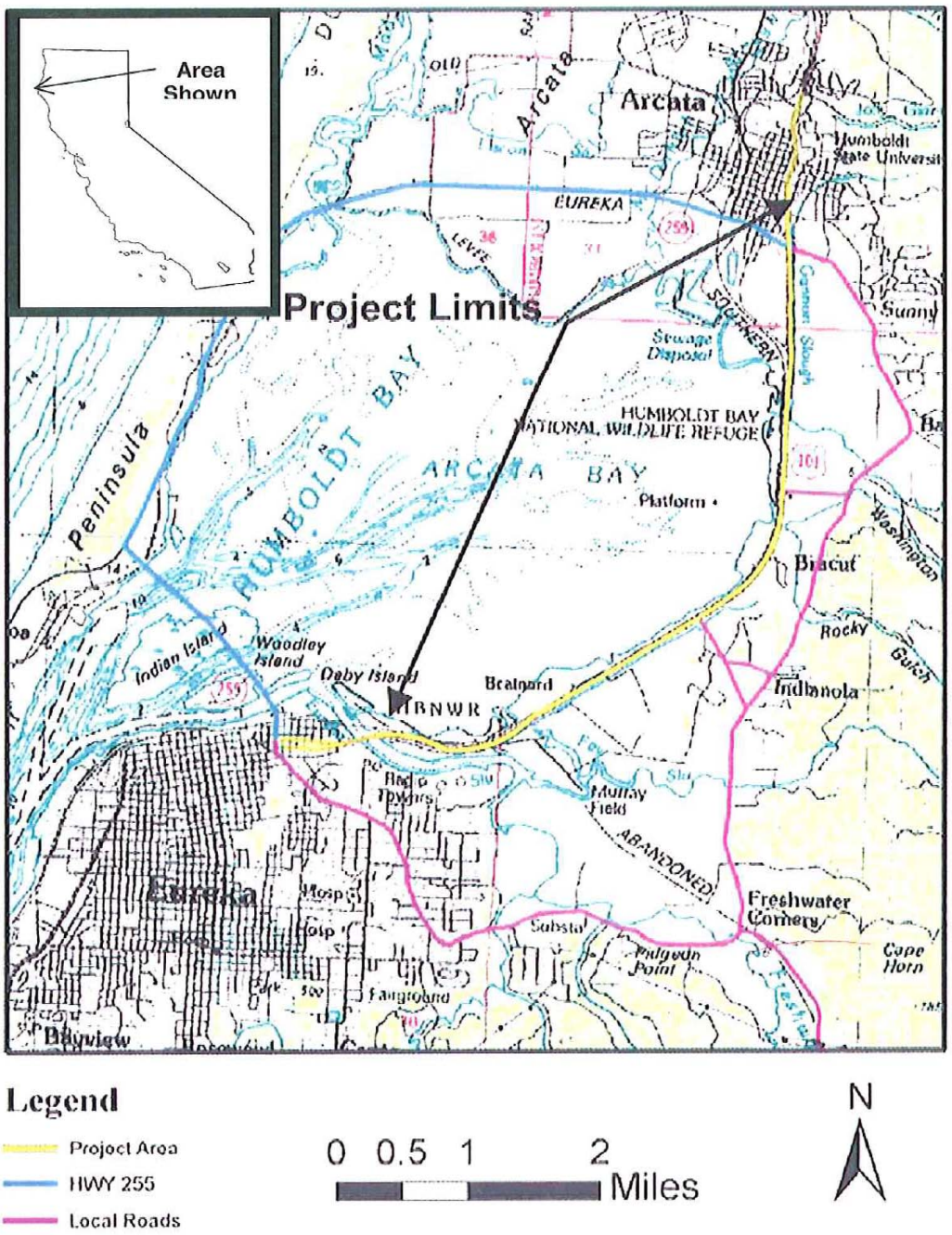

Figure S-1
Project Location Map

Definitions and Acronyms used in this document

Definitions

Abutment - A stone, concrete, brick, or timber structure supporting the end of a span.

Attainment area - An area that meets air quality standards.

Attenuation - The reduction of noise.

Bedrock - Solid rock that underlies all soil, sand, clay, gravel, and loose material.

Bent - A bridge support column founded on land.

Biological Opinion - A document that is the product of formal consultation, stating the opinion of the USFWS on whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

California Department of Fish and Game (CDFG) - The state agency that manages California's wildlife and plant resources.

California Department of Transportation (Caltrans) - Responsible for planning, designing, building, operating, and maintaining California's state highway system.

Candidate species - Any species of fish, wildlife, or plant which has been determined to be candidates for listing under Section 4 of the Endangered Species Act of 1973 (amended).

Coastal Zone Management Act (CZMA) - The CZMA regulates development in coastal areas to protect the unique resources in such areas.

Cofferdam - A temporary water-tight enclosure built in the water and pumped dry to expose the bottom so that construction of piers can be undertaken.

Column - A supporting pillar.

Contaminant source - A facility that treats, stores, or disposes of hazardous waste, uses hazardous substances, or stores petroleum products on site.

Cultural resources - Archaeological and historic resources eligible for or listed on the National Register of Historic Places. Cultural resources include buildings, sites, districts, structures, or objects having historical, architectural, archaeological, cultural, or scientific importance.

Cumulative impact - The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

dBA - A sound level in decibels, measured with a sound level meter having metering characteristics and frequency weighting specified in American National Standard Specifications for sound level meters (ANSI S1.4-1971). It is common to refer to numerical units of an A-weighted sound level as "dBA."

Deck - The portion of a bridge that provides direct support for vehicular, bicycle, and/or pedestrian traffic.

Draft Environmental Impact Statement (DEIS) - A draft report that analyzes potential environmental impacts of a proposed project in compliance with NEPA.

Endangered species - Any species of wildlife or plant which has been determined to be endangered under Section 4 of the Endangered Species Act of 1973 (amended). This definition is adopted from the USFWS, Section 7 regulations, 51 FR 19926.

Equivalent Sound Level (L_{eq}) - A measure of sound energy over a period of time, or a sound level which, in a stated period of time, would contain the same acoustical energy as the time-varying sound during the same period.

4 (f) resources - Resources protected by Section 4(f) of the Department of Transportation Act. These include public park and recreation lands, wildlife and waterfowl refuges, and historic sites eligible or listed on the National Register.

Falsework - A temporary wooden or metal framework built to support a structure under construction until that structure is self-supporting.

Federal Aviation Administration (FAA) - The federal agency that issues and enforces regulations and standards related to the manufacture, operation, certification, and maintenance of aircraft.

Federal Highway Administration (FHWA) - The federal agency that coordinates highway transportation programs in cooperation with states and other partners. It provides federal financial assistance to the States to construct and improve the National Highway System, urban and rural roads, and bridges.

Fill - Earth used to create embankments or to raise low-lying areas in order to bring them to grade. Under the Clean Water Act (USACE jurisdiction), fill is defined as material used for the primary purpose of replacing an aquatic area with dry land, or a change in the bottom elevation of a water body. Under the McAteer-Petris Act (BCDC jurisdiction), fill is defined as any solid, pile-supported, floating, cantilevered, or suspended material that is placed bayward of the Mean High Tide Line, or the +1.5-meter (5.0-foot) contour line where marshlands are present.

Final Environmental Impact Statement (FEIS) - A document that responds to comments received on the DEIS and provides updated information that has become available after publication of the DEIS.

Floodplain - The part of the ground surface inundated with water on a recurring basis, usually associated with the one percent recurrence interval (100-year) flow.

Footing - The enlarged, or spread-out, lower portion of a substructure, which distributes the structure load either to the earth or to supporting piles.

Foundation - The supporting material upon which the substructure portion of a bridge is placed.

General Plan - A document that contains policies used to implement the goals of a community.

Geomorphic - Of the earth's surface configuration.

Grade - A slope or gradual incline.

Groundwater - Water beneath the earth's surface between saturated soil and rock that is identified supplies wells and springs.

Haunched girder - An arched beam used between support piers.

Inundation - The act of covering with water.

Isolator bearing - A bearing developed to protect structures against earthquake damage. Under seismic loading, the bearing becomes more flexible. This allows it to isolate the structure from the effects of earthquake motion.

Landscape unit - A geographically distinct portion of an area that has a particular visual character.

Least Environmentally Damaging Practicable Alternative (LEDPA) - This designation under the Federal Clean Water Act Section 404 (b)(1) alternatives evaluation process. The Section 404 (b)(1) process requires USACE and EPA to make a determination of the LEDPA for any action involving discharge of dredge or fill material into Waters of the U.S.

Level of Service (LOS) - The operating level of an intersection or roadway segment can be described using the term Level of Service. Level of Service is a qualitative description of operation based on delay and maneuverability. It can range from "A" representing free flow conditions to "F" representing gridlock.

Liquefaction - The loss of strength that can occur in loose, saturated soil during or following seismic shaking. This condition can produce a number of ground effects, including lateral spreading, boils, ground lurching, and settlement of fill material.

Maintenance area - An area that had previously been designated a non-attainment area, but now meets applicable air quality standards.

Marine Mammal Protection Act - Provides for the protection and conservation of marine mammal species.

Maximum Credible Earthquake (MCE) - The largest earthquake reasonably capable of occurring based on current geological knowledge.

Metamorphic - Pertaining to an alteration in composition, texture, or structure of rock masses caused by great heat and/or pressure.

Migratory Bird Treaty Act of 1918 - Reflects agreements involving the United States, Great Britain (for Canada), Mexico, Japan, and the former Soviet Union to protect migratory bird populations.

Mitigation - Measures taken to minimize adverse environmental impacts. Mitigation could reduce the magnitude and extent of an impact from a level of significance to a level of insignificance.

National Environmental Policy Act (NEPA) - The United States' basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy.

National Historic Preservation Act of 1966 - The primary federal law pertaining to protection of cultural resources, referred to as Section 106.

National Oceanic and Atmospheric Administration (NOAA) Fisheries - oversees the Administration's programs which support the domestic and international conservation and management of living marine resources.

National Register eligible - Cultural resources eligible for inclusion on the National Register of Historic Places.

National Register of Historic Places - A federal listing of historic resources protected under the National Historic Preservation Act of 1966.

Navigation channel - An area of water used for marine vessel travel under bridges.

Non-attainment area - An area that does not meet air quality standards.

Noise Abatement Criteria - Noise level standards above which noise reducing actions should be considered.

Outfall - The place where a sewer, drain, or stream discharges into adjacent water.

Pier - A structure composed of stone, concrete, brick, steel or wood and built in shaft or block-like form to support the ends of the spans of a multi-span superstructure at an intermediate location between its abutments.

Pile - A rod or shaft-like linear member driven into the earth as a foundation or support for a structure.

Pile cap - The topmost portion of a pier. On rigid frame piers, the term applies to the beam across the column tops.

Profile - refers to the rise in roadway elevation.

Record of Decision - A public document that explains the reasons for a project decision and summarizes any mitigation measures that will be incorporated in the project.

Right-of-way - Land, property, or interest therein, acquired for infrastructure such as a highway, rail bed, pipeline, electric power lines, or telephone facilities. The land has been set aside as an easement or in fee, either by agreement or by condemnation.

Riparian - An aquatic or terrestrial ecosystem that is associated with bodies of water, such as streams, lakes, or wetlands, or is dependent upon the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage. Riparian areas are usually characterized by dense vegetation and an abundance and diversity of wildlife.

Riprap - Brickbats, stones, blocks of concrete or other materials deposited upon shores to prevent erosion and scour by water flow.

Silt - A sedimentary material consisting of fine mineral particles in size between sand and clay.

Special status species - Any species of fish, wildlife, or plant that is officially listed as Rare, Threatened, Endangered, or candidate for Rare, Threatened, or Endangered species listing under the state or federal Endangered Species Acts.

State Implementation Plan (SIP) - A plan for attaining national ambient air quality standards required by the Clean Air Act.

State Office of Historic Preservation - The state agency that assists private citizens, private institutions, local governments, and state and federal agencies in the identification, evaluation, protection, and enhancement of properties significant in California history and archaeology; also responsible for reviewing federal undertakings that affect cultural resources on or eligible for the National Register of Historic Places.

Stress - An applied force or system of forces that tends to strain or deform a body.

Substructure - The abutments, piers, or other constructions built to support the span or spans of a bridge. The superstructure is supported by the substructure; the substructure is placed on the foundations.

Superelevation - The transverse inclination of the roadway surface within a horizontal curve. The purpose of superelevation is to provide a means of resisting or overcoming the centrifugal forces of vehicles in transit.

Superstructure - The entire portion of the bridge structure that primarily receives and supports highway, railway or other traffic loads. It is supported by the substructure.

Surface runoff - Water that runs off streets and land and enters a body of water.

Tectonic - Pertaining to structural deformations in the earth's surface.

Temporary structure - A structure that is used to support a permanent structure that is temporarily unable to support itself.

Thrie beam guardrail (or barrier) – A type of roadway barrier placed longitudinally to prevent errant vehicles from entering the roadside or median hazard.

Traffic Management Plan - A plan to manage traffic during construction of projects to reduce congestion.

U.S. Army Corps of Engineers (USACE) - Federal agency with jurisdiction over Waters of the U.S. Waters of the United States as defined by the Clean Water Act include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce.

U.S. Coast Guard (USCG) - Federal agency with jurisdiction over navigable waterways.

U.S. Environmental Protection Agency (EPA) - The federal agency responsible for maintaining environmental quality, including air quality, noise, and hazardous waste management.

U.S. Fish and Wildlife Service (USFWS) - The federal agency that administers the federal Endangered Species Act and is involved in protection of fish and wildlife habitat, including wetland areas.

Visual dominance - The contrast between a project and its setting, described in terms of vegetation, landform, and structural changes.

Visual image type - An area that exhibits a fairly homogeneous visual quality. Types that are present in the SFOBB study area include recreational, industrial, institutional/military, historical, and open space.

Watershed - the point of high ground dividing two different drainage systems.

Waters of the United States - defined by the Clean Water Act include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce.

Waterway - The available width for the passage of water beneath a bridge.

Wetlands - According to regulations of the U.S. Army Corps of Engineers, wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and similar areas and are subject to protection under Executive Order 11990 and Section 404 of the Clean Water Act.

+

Acronyms

AADT Average Annual Daily Traffic

ACHP Advisory Council on Historic Preservation

ADT Average Daily Traffic

APE Area of Potential Effect

ASR Archaeological Survey Report

BMPs Best Management Practices

BSA Biological Study Area

CAA Federal Clean Air Act

Caltrans California Department of Transportation

CARB California Air Resources Board

CCAA California Clean Air Act

CDFG California Department of Fish and Game

CERCLA Comprehensive Environmental Response, Compensation and Liability Act

CEQ Council on Environmental Quality

CEQA California Environmental Quality Act

CESA California Endangered Species Act

CFR Code of Federal Regulations

CHP California Highway Patrol

CNDDB California Natural Diversity Database

CNPS California Native Plant Survey

CO Carbon Monoxide

CWA Clean Water Act

CZMA Coastal Zone Management Act

CZMP Coastal Zone Management Plan

dB Decibel

dBA A-weighted decibel

dBA L_{eq} A-weighted decibel equivalent sound level

DEIR Draft Environmental Impact Report

DEIS Draft Environmental Impact Statement

DTSC California Department of Toxic Substance Control

EFH Essential Fish Habitat

EIR Environmental Impact Report

EIS Environmental Impact Statement

EPA U.S. Environmental Protection Agency

ESA Environmentally Sensitive Areas

ESU Evolutionary Significant Unit

FAA Federal Aviation Administration

FCWA Federal Clean Water Act

FEIS Final Environmental Impact Statement

FHWA Federal Highway Administration

FSTIP Federal Statewide Transportation Improvement Program

FTA Federal Transit Administration

ha Hectare or hectares

HASR Historic Architecture Survey Report

HCAOG Humboldt County Association of Governments

HCM Highway Capacity Manual

HPSR Historic Property Survey Report

HWCL Hazardous Waste Control Law

ISTEA Intermodal Surface Transportation Efficiency Act

km Kilometer or kilometers

kph Kilometers per hour

KV Kilovolt

LEDPA Least Environmentally Damaging Practicable Alternative

L_{10} Noise level equaled or exceeded 10% of the time

L_{eq} Equivalent Sound Level

L_{max} Maximum Level

LUST Leaking Underground Storage Tank

m Meter or meters

MCE Maximum Credible Earthquake

mg/L Milligrams per Liter

mg/m^3 Milligrams per Cubic Meter

MHTL Mean High Tide Line

MHW Mean High Water

mi Mile or Miles

MIS Major Investment Study

MLLW Mean Lower Low Water

MLW Mean Low Water

mph Miles per hour

MPO Metropolitan Planning Organization

MPRSA Marine Protection, Research, and Sanctuaries Act

MSL Mean Sea Level

MTL Mean Tide Level

NAAQS National Ambient Air Quality Standards

NAC Noise Abatement Criteria

NAHC Native American Heritage Commission

NEPA National Environmental Policy Act

NOD Notice of Determination

NPDES National Pollutant Discharge Elimination System

NRHP National Register of Historic Places

OSHA Occupational Safety and Health Administration

PDT Project Development Team

$PM_{2.5}$ Particulate Matter with an Aerodynamic Diameter less than 2.5 Micrometers

PM_{10} Particulate Matter with an Aerodynamic Diameter less than Ten Micrometers

ppm Parts per Million

ROD Record of Decision

RCRA Resource Conservation and Recovery Act

RTP Regional Transportation Plan

RTPA Regional Transportation Planning Agency

RWCQCB Regional Water Quality Control Board

SARA Superfund Amendments and Reauthorization Act

SHPO State Historic Preservation Officer

SIP State Implementation Plan

SVOC Semi-Volatile Organic Compound

SWPPP Storm Water Pollution Prevention Plan

TCE Temporary Construction Easement

TIP Transportation Improvement Program

TMP Traffic Management Plan

TPH Total Petroleum Hydrocarbons

TRPH Total Recoverable Petroleum Hydrocarbons

TSCA Toxic Substance Control Act

ug/m^3 Micrograms per Cubic Meter

ug/L Micrograms per Liter

USACE U.S. Army Corps of Engineers

USC United States Code

USCG U.S. Coast Guard

USFWS U.S. Fish and Wildlife Service

UST Underground Storage Tank

VA Value Analysis

VOC Volatile Organic Compound

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Chapter 1 Project Need and Purpose

1.1 Project Need

The project need consists of the transportation problems and deficiencies to which Caltrans, FHWA, and HCAOG are responding. This section describes and quantifies concerns including safety, traffic operating conditions, long-term roadway maintenance, and highway design standards. The statement of project need, together with the purpose, provides focus to the identification, development, and evaluation of alternatives.

Reduce collisions

Injury Collision Rates at Intersections. Intersections in the Route 101 corridor between Eureka and Arcata have been the site of numerous collisions, resulting in deaths, serious injury, and high property damage. At the time of project initiation, five-year collision data (June 1, 1994 – May 31, 1999) was used to evaluate the Route 101 Corridor and seven major intersection or access locations (Cole Avenue, Airport Road, Mid-City Motor World, Simpson sawmill, Indianola Cutoff, Bracut, and Bayside Cutoff) between the Eureka Slough Bridges and State Route 255 in Arcata. Table 1-1 summarizes the five-year collision data (June 1, 1994 – May 31, 1999) collision data at Route 101 intersections between Eureka and Arcata.

Reported collisions for the seven major intersections within the expressway portion during the five-year period included five fatal collisions, 44 injury collisions and 85 total collisions. The five-year total collision rate exceeded the statewide average at all of the public access locations (Cole, Airport, Indianola and Bayside) and at one of three private access locations (Mid-City Motor World). The fatal plus injury collision rate exceeded the statewide average at all four public access locations (Cole, Airport, Indianola and Bayside) and at one of the three private access locations (Mid-City).

Although traffic volumes at access locations (intersections) are less than 5% of corridor traffic volumes, 46% of total collisions, 54% of injury collisions and 83% of fatal collisions occurred at intersections: consequently, intersections represent a substantial safety concern. Impaired driver visibility during heavy rain or fog, left-turn movements across high speed/high volume traffic, and non-standard acceleration/deceleration lanes are factors contributing to higher levels of injury collisions at intersections. Based on past collision history, an increase in the number of collisions is anticipated in the future as traffic volumes increase.

Route 101 Mainline (through traffic lanes) from Eureka Slough Bridge to State Route 255/Route 101 Interchange in Arcata. Collisions along the segment (inclusive of intersection collisions) during the five-year period included two fatal collisions, 121 injury collisions and 268 total collisions. Table 1-1 indicates the pre-Safety Corridor five-year (1997-2002) Route 101 mainline collision rate was generally above the statewide average of similar State routes for fatal, injury, and total collisions. In other words, the actual collision totals were higher than what would be expected of similar highway facilities throughout the State.

Table 1-1									
Collision Rates 5/19/1997 through 5/18/2002 Route 101 From Eureka Slough To 11th St., Arcata, KP 128.6 to 138.9 (PM 79.9 to 86.3)									
Route 101 Intersection or Ramp Locations - see map below table for 101/255 Interchange Ramp Locations		**Actual**	**State Avg.**	**% of State Avg.**	**Route 101 Intersection or Ramp Locations - see map below table for 101/255 Interchange Ramp Locations**		**Actual**	**State Avg.**	**% of State Avg.**
INTERSECTIONS[1]									
Cole Avenue	Fatal	0.015	0.001	1500%	**Route 255 NB Loc. 3**	Fatal	0	0.006	0%
	Fatal + Injury	0.12	0.06	200%		Fatal + Injury	0	0.33	0%
	Total	0.24	0.14	171%		Total	0	0.9	0%
Airport Road	Fatal	0	0.001	0%	**Route 255 NB Loc. 4**	Fatal	0	0.003	0%
	Fatal + Injury	0.09	0.06	**150%**		Fatal + Injury	0	0.42	0%
	Total	0.15	0.14	**107%**		Total	0.17	1.25	14%
Mid-City	Fatal	0	0.001	0%	**Route 255 SB Loc. 5**	Fatal	0	0.004	0%
	Fatal + Injury	0.14	0.05	**280%**		Fatal + Injury	0.16	0.13	**123%**
	Total	0.2	0.13	**154%**		Total	0.16	0.4	40%
Simpson Mill	Fatal	0	0.002	0%	**Route 255 SB Loc. 6**	Fatal	0	0.003	0%
	Fatal + Injury	0.02	0.08	25%		Fatal + Injury	0	0.22	0%
	Total	0.03	0.19	16%		Total	0.36	0.75	48%
Indianola Cutoff	Fatal	0.043	0.002	**2150%**	**Route 255 SB Loc. 7**	Fatal	0	0.004	0%
	Fatal + Injury	0.17	0.08	**213%**		Fatal + Injury	0.17	0.15	**113%**
	Total	0.26	0.19	**137%**		Total	0.7	0.45	**156%**
Bracut	Fatal	0	0.008	0%	**Route 255 SB Loc. 8**	Fatal	0	0.004	0%
	Fatal + Injury	0.09	0.16	56%		Fatal + Injury	0.45	0.26	**173%**
	Total	0.21	0.33	64%		Total	1.81	0.9	**201%**
Bayside Cutoff	Fatal	0.015	0.001	**1500%**	**Route 255 NB Loc. 9**	Fatal	0	0.001	0%
	Fatal + Injury	0.1	0.06	**167%**		Fatal + Injury	0	0.24	0%
	Total	0.18	0.14	**129%**		Total	0	0.7	0%
South G St On-Ramp	Fatal	0	0.003	0%	**Route 255 NB Loc. 10**	Fatal	0	0.003	0%
	Fatal + Injury	0	0.22	0%		Fatal + Injury	0.21	0.22	95%
	Total	0	0.6	0%		Total	0.21	0.6	35%
South G St Off-Ramp	Fatal	0	0.006	0%	**Route 255 NB Loc. 11**	Fatal	0	0.002	0%
	Fatal + Injury	0	0.33	0%		Fatal + Injury	0.59	0.08	**738%**
	Total	0	0.9	0%		Total	0.59	0.25	**236%**

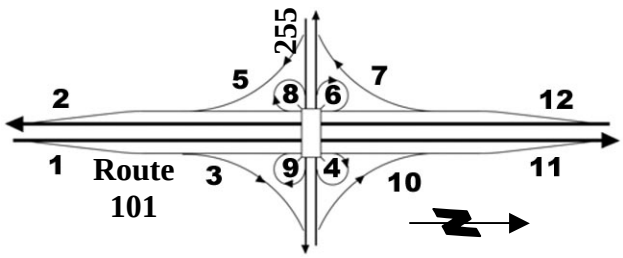
Route 255 NB Loc. 1	Fatal	0	0.002	0%
	Fatal + Injury	0	0.08	0%
	Total	0.12	0.25	48%
Route 255 SB Loc. 2	Fatal	0	0.002	0%
	Fatal + Injury	0	0.08	0%
	Total	0	0.25	0%

Route 255 SB Loc. 12	Fatal	0	0.002	0%
	Fatal + Injury	0.17	0.08	**213%**
	Total	0.17	0.25	68%

HIGHWAY TOTALS (INCLUDING INTERSECTIONS) [2]

	Fatal	0.015	0.016	94%
	Fatal + Injury	0.25	0.54	46%
	Total	0.57	1.28	45%

1. Collisions per million vehicles.
2. Collisions per million vehicle miles.



The collision rates for the intersections are based on the number of collisions divided by the traffic volumes, including the cross street and mainline, for specified time intervals. The collision rates for the on and off ramps are based only on the volume of traffic using the specific ramp.

In 2002, Caltrans implemented a Safety Corridor as an interim measure to improve safety on Route 101 on the eight-kilometer (five-mile) expressway segment between Eureka and Arcata. The Safety Corridor included such measures as reducing the posted speed limit from 60 mph to 50 mph.

During the Safety Corridor's first year, there were 45% fewer collisions, including 80% fewer collisions at intersections. While collision frequency has decreased to date, the Safety Corridor's effectiveness is expected to decrease over time as traffic volumes are expected to increase approximately 50% by the year 2031. The Safety Corridor is discussed in detail in section 1.3.

Operational Conflicts – Left-Turn and Left-Merge Movements

A highway "operational conflict" occurs when vehicles are merging or turning across lanes of opposing traffic. On Route 101, operational conflicts occur because of left-turns and left-merge on and off movements at median crossings within the Route 101 Corridor. Operational conflicts can lead to driver confusion and therefore increase collisions. Left merge on and off movements currently occur at all median crossings within the corridor. In order to have a positive effect on safety and reduce driver mistakes, elimination of left-turn and left-merge movements is a priority.

Left-Merge Movements. A left-merge movement is one where traffic on an acceleration lane merges into, or a deceleration lane merges out of, the main flow of traffic from the left-hand side of the road. This can be an unexpected move to motorists since more than 95% of highway merge movements are right hand merges. Left-merge movements have much higher collision rates than that of right-side ramp exits and entrances. Of the total number of rear-end, sideswipe and overturned vehicle collisions occurring at intersections along Route 101 from 1994 to 1999, three times as many occurred in the left lane as the right.

The American Association of State Highway and Transportation Officials (AASHTO) 2001 publication "A Policy on Geometric Design of Highways and Streets" states: "Left-side main roadway exit ramps should be avoided because they may appear to be a right side entrance ramp to a confused motorist." and later in the guide: "Left-hand entrances and exits are contrary to the concept of driver expectancy when intermixed with right-hand entrances and exits. Therefore, extreme care should be exercised to avoid left-hand entrances and exits in the design of interchanges."

Left-Turns Across Route 101 To Access or Exit Private Businesses and Public Roads. Left-turns crossing Route 101 increase collision potential since crossing Route 101 is difficult because of the high volume of mainline traffic along Route 101. In addition, traffic flow along Route 101 through lanes is impeded when drivers leave left-turn pockets: this occurs when drivers are unable to cross Route 101 mainline because they perceive there are insufficient traffic gaps or because the wait to turn is perceived to be too long. Commercial trucks, which comprise approximately 5% of the total traffic on Route 101, can dominate left-turn pockets and require longer traffic gaps to complete left-turns.

The above conditions lead to a slowing of Route 101 mainline traffic and an increased potential for collisions. Some improvement can be expected by extending the existing acceleration and deceleration lanes and turn pockets. The closure of the Route 101 median opening at Cole Avenue and improving the acceleration and deceleration lanes at Airport Road and Route 101 were completed in 2004. These improvements collectively improved the operation of Route 101 as well as enhancing safety. The acceleration and deceleration lanes at Airport Road and Route 101 are the only acceleration and deceleration lanes at Route 101 intersections that meet highway

engineering standards between the Eureka Slough Bridge in Eureka and the Route 101/255 interchange in Arcata.

Traffic volumes are expected to increase in future years, resulting in an increase in operational conflicts in the No-Build Alternative scenario. Over the next twenty years, an increase in business, commuter, and interregional traffic trips is expected to steadily raise the overall traffic volume within the Eureka-Arcata corridor by approximately 50%: this increase would substantially reduce the number of suitable gaps in traffic that allow left-turns across opposing traffic lanes.

Level-of-Service (LOS) Justification

A third need is to reduce delay at intersections by improving Level-of-Service (LOS). (See Appendix B for a description of LOS.) There is no substantial delay or capacity problem along the Eureka to Arcata corridor, however, unacceptable delays associated with left-turn traffic crossing Route 101 currently exist and are expected to deteriorate further if this problem is not corrected.

Improving Route 101 by reducing traffic congestion and implementing improvements at the at-grade intersections to improve circulation are goals of both HCAOG and Caltrans. HCAOG is a Joint Powers Agency comprised of the seven incorporated cities (Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell, and Trinidad), and the County of Humboldt. The agency is largely responsible for programming State highway public transportation resources. This can be accomplished by reducing delay (improving the LOS) at the at-grade intersections.

LOS is a qualitative measure for describing operational conditions within a traffic stream or at an intersection. LOS is designated by a letter A-F, with A representing the least delay or congestion and F representing the greatest delay or severest congestion. LOS is defined differently for Route 101 mainline than it is for intersections (both non-signalized and signalized). The preferred LOS for Route 101 mainline is D or better for urban areas, which includes the segment between Eureka and Arcata (Source: Caltrans Route Concept Report - Route 101 Corridor. District 1. October 2002).

At-grade intersection LOS for left-turn movements is currently a substantial problem along the corridor. In 1998, most left-turn movements were LOS E and will degrade to LOS F in 2031 under the No-Build Alternative. Throughout this document, the year 2031 is used as a planning horizon to predict conditions that would result compared to baseline conditions in order to characterize change. The year 2031 is also the approximate 20-year time-period from the anticipated end of project construction. Many of the right-turns are currently at LOS C, degrading to LOS D (26 to 35 seconds of delay per vehicle) by 2031 under the No-Build Alternative.

Table 1-2 indicates that the existing LOS on Route 101 in both the mainline and at intersections is expected to degrade at every location and direction.

TABLE 1-2
Level-of-Service (LOS)* Along Route 101 (PM Peak)
For year 2006 Existing and Year 2031 No-Build Alternative

Route 101 Intersections	Left-Turn Onto 101		Right-Turn Onto 101		Left-Turn Off of 101		Right-Turn Off of 101	
Access Locations	2006	2031	2006	2031	2006	2031	2006	2031
Cole Avenue	E	**NA****	C	C	E	NA**	C	D
Airport Road	E	F	C	C	E	F	C	D
Mid-City	E	F	C	D	E	F	C	D
Simpson Sawmill	E	F	C	F	E	F	C	D
Indianola Cutoff	E	F	C	C	E	F	C	C
Bracut (West)	E	F	C	C	E	F	C	D
Bracut (East)	D	F	C	C	E	F	C	D
Bayside Cutoff	E	F	C	C	D	F	C	D

ROUTE 101 MAINLINE (Through lanes)		
	2006	**2031**
Northbound Route 101	B	D
Southbound Route 101	B	C

* See Appendix B for a Level-of-Service explanation.

** Not applicable (NA) since the Route 101 median opening at Cole Avenue was closed in 2004.

Route 101 Roadway Maintenance and Highway Standards

The Route 101 roadway requires various rehabilitation improvements to address long-term maintenance issues and to bring the roadway up to current highway design standards:

- The existing Route101/255 interchange ramps; existing acceleration/deceleration lanes (except at Airport Road), and three of the existing bridges within the project limits do not meet current traffic design standards in terms of adequate width, length, or safety.

- The existing southbound Jacoby Creek Bridge was originally constructed in 1920 and widened in 1956. Because of age, deterioration, and the need for more frequent and costly maintenance, this bridge needs to be replaced.

- The existing northbound Jacoby Creek and Gannon Slough Bridges have non-standard right shoulder widths and need to be widened.

- The existing Route 101 roadway pavement is deteriorating and maintenance costs will rise as the pavement further deteriorates. Interim measures such as spot repairs can extend the pavement life, however, it is more cost effective to rehabilitate the entire Route 101 roadway between the project limits.

- Currently there are fixed objects such as trees and billboards near the vehicle traveled way of Route 101. Any fixed object too close to the edge of the traveled way can pose potential hazards for errant vehicles or vehicles making emergency maneuvers. Removing or shielding fixed objects that are within nine-meters or thirty-feet from the edge of the traveled way, known as the clear recovery zone, will enhance safety by reducing the likelihood of impact.

- There are large eucalyptus trees that within 1.2-meters or four-feet to the existing guardrail west of Route 101 and north of the Simpson Mill. Fixed objects such as large trees reduce the energy absorbing effectiveness of the guardrail. These trees need to be removed to enhance safety.

- The tide gates were installed in 1954 at ditches adjacent to Route 101 to minimize tidal flooding from extreme high tides. They are currently in poor condition and have required repair with increasing frequency. All tide gates need to be replaced.

- Two rows of existing metal thrie beam traffic barrier extend within the Route 101 median from approximately South G Street to the 11th Street overcrossing in Arcata. At this location, the median is unpaved and narrow (6.7-meters or 22.0-feet). On-going repair and maintenance of the median and the barrier requires lane closures and exposing Caltrans maintenance personnel to traffic hazards. For this reason a concrete median safety barrier is proposed to replace the thrie beam barrier.

1.2 Project Purpose

The proposed Corridor Improvement Project consists of various improvements on Route 101 in Humboldt County between the cities of Eureka and Arcata. More specifically, the project extends from the north end of the Eureka Slough Bridge (kilometer post 128.6 or Post mile 79.9) north to the 11th Street overcrossing in Arcata (kilometer post 138.9 or post mile 86.3) as shown in the project location map (Figure S-1) and the Plan Sheets in Appendix A. Major project features may include closing roadway median crossings, constructing an interchange at Indianola Cutoff,

replacing and widening Jacoby Creek and Gannon Slough Bridges, and realigning and signalizing the Route 101/Airport Road intersection.

The Eureka-Arcata Corridor Improvement project is listed in both the 2006 State Transportation Improvement Program (STIP) for environmental and design work only and the 2006 State Highway Operations and Protection Program (SHOPP). The Humboldt County Association of Governments (HCAOG), as the regional agency, programmed the safety improvement portion of the project in the STIP. Caltrans programmed the roadway rehabilitation portion of this project as part of the SHOPP. The STIP portion of the project is approximately $31 million and the SHOPP portion is approximately $31 million for a total estimated project cost of $62 million. Funding from both programs requires approval by the California Transportation Commission (CTC).

The purposes of the Corridor Improvement Project are:

Improve safety at intersections. The primary purpose of the Corridor Improvement Project consists of enhancing traffic safety and decreasing the number of conflicting traffic movements, thereby reducing the number and severity of collisions. A "conflicting traffic movement" or "operational conflict" occurs when two or more vehicles in different lanes are simultaneously merging into the same lane or in situations in which one or more vehicles are turning left across lanes of opposing traffic. Within the Route 101 Corridor, potential traffic operational conflicts exist because left-turns across Route 101 and vehicle merges from the left side of Route 101 at median crossings (openings) are presently allowed. The potential for broadside collisions occurs when vehicles turning left across Route 101, either starting from a cross street or from Route 101, turn left onto a cross street. This potential for broadsides exists at six of the Route 101 intersections between Eureka and Arcata. In addition, in many instances drivers on Route 101 are not expecting vehicles entering Route 101 from the drivers' left side. Operational conflicts can lead to driver confusion and therefore increase the possibility of collisions.

Reduce traffic operational conflicts along the Route 101 corridor. The secondary purpose of the proposed project is to minimize left-turns and confusing traffic merge and turn movements such as traffic entering from the left-side of the road.

Reduce delay at intersections. Another purpose of the proposed project is to reduce traffic delays at intersections along the Route 101 corridor to provide a Level-of-Service (LOS) D or better along mainline and for intersection movements through the year 2031. (See Appendix B for an explanation of level of service.)

Resurface, restore, and rehabilitate the pavement and roadway. The final project purpose is to extend the serviceable life of the existing Route 101 roadway pavement for a minimum of ten years within the project limits and upgrade the roadway facilities to current design standards. Pursuant to Caltrans Internal Design Recommendations for rehabilitation projects, the purpose of Roadway Rehabilitation

(RR) projects is to preserve and extend the service life of existing highways for a minimum of ten years and to enhance highway safety. RR work is generally regarded as heavy, non-routine maintenance work. It differs from new construction or reconstruction since it generally does not incorporate capacity improvements, major realignment, or major upgrading of geometric features or standards.

The ten-year minimum would avoid costly improvements that would need to be repeated more frequently, such as capital maintenance projects, which generally consist of repairing deteriorating pavement and adding pavement surfacing to extend the life of the roadway until a longer-term project to restore the roadway can be implemented.

The minimum lifetime of these improvements generally exceeds ten years. Bridge structures are typically designed for a life of 100 years. The northbound bridges for this project are currently fifty years old and do not need to be replaced at this time. However, as design standards have changed over the years, rehabilitation projects reflect those changes. In this case, the shoulder widths have increased, and bridge rail standards have changed, so the northbound bridges will be widened, and the bridge rail replaced with those that will meet current safety standards. The southbound bridge is approximately 85 years old, does not meet current standards, and its structural elements are deteriorating, indicating the end of its useful life. Therefore, it will be replaced for this project. This Roadway Rehabilitation project will extend the life of the bridges a minimum of 25 years, and up to 100 years in the case of the bridge replacement.

Asphalt pavement typically has a shorter life due to oxidation of the pavement surfaces, and increasing traffic volumes (particularly truck traffic). The design life for the paving for this project is expected to exceed fifteen years because of the open graded paving that will be applied over an initial proposed paving added to extend the life of the roadway.

These improvements would satisfy longstanding priorities of the Humboldt County Association of Governments (HCAOG) and Caltrans. The need for the project is expected to increase over time as traffic volumes along the corridor increase.

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) developed the project need and purpose statement in consultation with the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and the National Marine Fisheries Service during the NEPA/404-Integration process, and with representatives from the County of Humboldt and the cities of Eureka and Arcata. See Appendix E for more information regarding the NEPA/404-Integration process.

None of the proposed alternatives include constructing new through traffic lanes to create additional traffic carrying capacity of Route 101.

1.3 Project Background

Route 101 is often referred to as the "lifeline of the North Coast," since it is the most important interregional highway on the northern California coast. Route 101 connects the Santa Rosa/San Francisco metropolitan areas to the south and the State of Oregon to the north. Route 101 functions as the principle route to many North Coast recreational areas, including State and National parks, rivers, and beaches.

Although the Route 101 segment between Eureka and Arcata extends through a predominately rural setting, it is the most heavily traveled roadway in Humboldt County. The combined population of the cities of Arcata and Eureka is approximately 45,000. However, the population that potentially uses the corridor most frequently (the unincorporated areas near Eureka, Arcata, and McKinleyville and the cities of Eureka and Arcata) is about 90,000. Most of Humboldt County's growth is occurring in and around cities and communities along the Route 101 corridor between Fortuna, 32 km (20 miles) south of Eureka, and McKinleyville, 24 km (15 miles) to the north.

Route 101 is heavily used for the transportation of intercity/interstate commerce. Commercial trucks comprise approximately 5% of the total traffic on Route 101 between Eureka and Arcata. Trucks access several businesses within the corridor as well as traveling to and from destinations beyond the corridor.

The Eureka-Arcata Corridor currently accommodates a number of different transportation modes. Murray Field a public airport north of the businesses on Jacobs Drive, is adjacent to Route 101 within the corridor. The airport currently accommodates approximately 100 aircraft. It does not accommodate major commercial passenger airline flights.

Redwood Transit System provides commuter bus service along the corridor between Eureka and Arcata as well as destinations further south and north.

Paratransit is a form of transportation service that is more flexible and personalized than conventional, fixed route or fixed schedule. Service is adjusted to individual needs. Dial-a-Ride is an example of Paratransit. Dial-A-Ride services were established in January 1979 as an experimental system to determine the needs of elderly and handicapped people who could not use the existing public transportation system. Dial-A-Ride/Dial-A-Lift service provides complimentary paratransit service to passengers certified under the Americans with Disabilities Act (ADA). In addition, it provides service to people over the age of 72 regardless of their medical condition. Dial-A-Lift is designed to serve wheelchair passengers. The City of Arcata and the City of Eureka contract their paratransit service to a private taxi company based in Eureka.

Bicycle use in the corridor is moderate, but interest has been expressed in developing a separate bicycle path adjacent to the corridor. Proponents predict that more commuter and recreational bicyclists would use the corridor if they could avoid riding on the highway shoulder, adjacent to high-speed vehicular traffic.

Humboldt Bay, which includes Arcata Bay, is regionally important for recreational and commercial boating. Portions of Humboldt Bay were recently deepened to allow large ships, including cruise ships, to enter the bay. Humboldt Bay is the only harbor for major shipping between San Francisco, California and Coos Bay, Oregon. Commercial marine transportation includes deep-draft shipping, barge traffic, and commercial fishing boats. There are several commercial ship docks and shipping related facilities located on the bay. Since the railroad has not been used for shipping for many years and has an uncertain future, Routes 101, 255, and 299 are the only major highways that serve as transportation links from the Humboldt Bay region.

The Northwestern Pacific Railroad is adjacent to, and west of Route 101 between Eureka and Arcata. This railway segment has experienced limited use in recent years since much of the line has been inoperative because of infrastructure damage. While historically this has been primarily a freight line, there has been interest in developing an excursion route between the community of Samoa and the City of Eureka.

Route 101 between Eureka and Arcata is currently a four-lane (two-lanes in each direction) expressway between Eureka Slough Bridge and Gannon Slough Bridge with a posted 50-mph speed limit. (An "expressway" is a high-speed divided highway for through traffic with access partially controlled. A "controlled access" facility is a roadway where the spacing and design of driveways, medians, median openings, traffic signals and intersections are strictly regulated by consideration of such factors as traffic volume and number of lanes, which gives preference to through traffic.) Vehicle headlights are currently required to be on 24 hours a day in this segment of the corridor to enhance visibility. North of Gannon Slough Bridge, the expressway changes to a four-lane freeway with a posted 65-mph speed limit. (A "freeway" is a high-speed divided highway for through traffic with fully controlled access—i.e. only grade-separated interchanges provide access to local roads.) The existing Route 101 expressway segment has the following dimensions:

- Four traffic lanes (two lanes each direction);
- Two 3.6-meter (twelve-feet) wide traffic lanes in each direction;
- 6.7 to 24.4-meters (22 to 80 feet) wide median separating the northbound and southbound lanes;
- 1.5-meter (five-feet) wide inside shoulders;
- 2.44-meter (eight-feet) wide outside shoulders.

There are currently seven at-grade Route 101 local street/driveway access locations within the expressway segment of Route 101 between Eureka and Arcata. (See Figures S-1 in the Summary and Plan Sheets in Appendix A.) Six of these access locations currently have Route 101 median crossings that allow for left-turn on and off movements, to and from the local streets/driveways. From south to north they are:

- Cole Avenue – The Route 101 median opening was closed to traffic in 2004 at this location; right-turn off from northbound Route 101 and right-turn on to Route 101 vehicle movements are permitted. Cole Avenue connects to Jacobs Avenue.

- Airport Road – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. The deceleration and accelerations lanes at this intersection were extended in 2004. Airport Road connects to Jacobs Avenue on the east side of Route 101.

- Mid-City Motor World – On the east side of Route 101, a private driveway connects Route 101 to this car dealership as well as a Fish and Game Wildlife Refuge. The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted.

- Simpson sawmill – On the west side of Route 101, a private driveway connects Route 101 and the sawmill. The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted.

- Indianola Cutoff – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. Indianola Cutoff connects Route 101 to Old Arcata Road to the east of Route 101.

- Bracut – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. There are businesses on both sides of Route 101 at this location.

- Bayside Cutoff – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. Bayside Cutoff connects Route 101 to Old Arcata Road to the east.

North of Bayside Cutoff and continuing through the City of Arcata, Route 101 becomes a freeway. The existing Route 101 freeway segment has the following dimensions:

- Four traffic lanes (two lanes each direction);

- Two 3.6-meter (twelve-feet) wide traffic lanes in each direction;

- 6.7 to 21.3-meters (22 to 70 feet) wide median separating the northbound and southbound lanes;
- 0.6-meter to 2.4 (two-feet to eight-feet) wide inside shoulders;
- 0.6-meter to 2.4 (two-feet to eight-feet) wide outside shoulders.

Interim Solution: The Safety Corridor

In May 2002, Caltrans implemented a Safety Corridor as a temporary measure to reduce intersection collision rates within the Route 101 expressway portion of the project limits between the Eureka Slough Bridges and the Gannon Slough Bridges until long-term project improvements can be constructed. Caltrans initially developed several interim strategies that could be readily implemented. Two public open houses were held in October 2001 to solicit feedback from business owners in the corridor and the public regarding these potential interim strategies. Caltrans, in cooperation with the Humboldt County Association of Governments and state and local law enforcement agencies, the Safety Corridor was selected as an interim solution consisting of what were referred to as the three E's: Engineering components, Education, and Enforcement. A breakdown of these elements is as follows:

<u>Engineering Components</u>

- Signs alerting motorists of speed reduction ahead (reducing speed limit from 60-mph to 50-mph);
- Radar activated signs indicating motorist speeds mounted with fixed speed limit signs;
- Requiring vehicle headlights to be on 24 hours a day within the Safety Corridor;
- Retrofitting existing stop signs with flashing red lights to further warn motorists on side street approaches of high speed cross traffic on Route 101.

<u>Education and Enforcement Components</u>

- Grant funding for educating the public by print, radio, television, and community events on the need for compliance with the elements of the Safety Corridor was obtained along with grant funding for additional/enhanced enforcement of speed and headlight use within the Safety Corridor. This grant was obtained from the Office of Traffic Safety and the funding expired after the first year of operation (May 2002 through May 2003.) While grants for additional funding to extend the enhanced enforcement and education

components are researched each year, none have been obtained, and there is no other source of funding for these components.

- The passage of State Senate Bill 1349 created the "Highways Safety Enhancement Double Fine Zone," which, when started in January 2003, doubled the fine for speeding violations within the Eureka-Arcata corridor and further reinforced the elements of the Safety Corridor. This Senate Bill expired on January 1, 2006 ending the double fine zone.

Since the Safety Corridor was implemented the total collisions and fatal plus injury collisions within the Safety Corridor have been substantially reduced. See Table 1-3 for the collision rates after implementation of the Safety Corridor. Although the data for the first few years of the implementation of the Safety Corridor indicates a reduction in collisions within the Safety Corridor, the fatal plus injury collision rate at Indianola Cutoff remains above the Statewide average for similar facilities.

Moreover, a review of safety corridors on other highways within the State has shown that their effectiveness is short lived. Among the explanations for this loss of effectiveness given by traffic safety engineers is the phenomenon of habituation. It explains why warning signs, which rely upon driver alertness and attentiveness, are not long-term meaningful substitutes for permanent roadway geometric (configuration of roadway elements) improvements engineered using the latest design standards. After an initial enhanced enforcement period (ranging one to three years), the collision rates in these 29 safety corridors approached the pre-safety corridor implementation collision rates. Despite the Safety Corridor, traffic volumes are predicted to increase over time resulting in an increase in traffic collisions even if the reduced speed limit remains in effect. See Section 3.1.6 Traffic and Transportation/Pedestrian and Bicycle Facilities in Chapter 3 for more information.

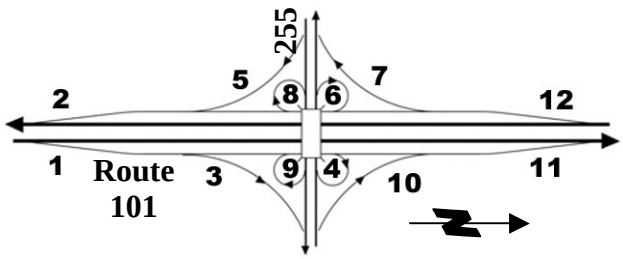
Table 1-3

Collision Rates 7/01/2002 Through 12/31/2005
Route 101 From Eureka Slough Bridge to 11th St., Arcata,
KP 128.6 to 138.9 (PM 79.8 to 86.3)

Route 101 Intersection or Ramp Locations - see map below table for 101/255 Interchange Ramp Locations		Actual	State Avg.	% of State Avg.	Route 101 Intersection or Ramp Locations - see map below table for 101/255 Interchange Ramp Locations		Actual	State Average	% of State Average
INTERSECTIONS[1]									
Cole Avenue	Fatal	0	0.001	0%	**Route 255 NB Loc. 3**	Fatal	0	0.006	0
	Fatal + Injury	0.02	0.06	33%		Fatal + Injury	0.31	0.33	94
	Total	0.06	0.14	43%		Total	0.31	0.9	34
Airport Road	Fatal	0	0.001	0%	**Route 255 NB Loc. 4**	Fatal	0	0.003	0
	Fatal + Injury	0.04	0.06	67%		Fatal + Injury	0	0.42	0
	Total	0.04	0.14	29%		Total	0.45	1.25	36
Mid City	Fatal	0	0.001	0%	**Route 255 SB Loc. 5**	Fatal	0	0.004	0
	Fatal + Injury	0.02	0.05	40%		Fatal + Injury	0	0.13	0
	Total	0.15	0.13	**115%**		Total	0.26	0.4	65
Arcata Redwood	Fatal	0	0.002	0%	**Route 255 SB Loc. 6**	Fatal	0	0.003	0
	Fatal + Injury	0	0.08	0%		Fatal + Injury	0	0.22	0
	Total	0	0.19	0%		Total	0.57	0.75	76
Indianola Cutoff	Fatal	0	0.002	0%	**Route 255 SB Loc. 7**	Fatal	0	0.004	0
	Fatal + Injury	0.10	0.08	**125%**		Fatal + Injury	0.22	0.15	**147**
	Total	0.20	0.19	**105%**		Total	0.44	0.45	98
Bracut	Fatal	0	0.008	0%	**Route 255 SB Loc. 8**	Fatal	0	0.004	0
	Fatal + Injury	0.02	0.16	13%		Fatal + Injury	0.31	0.26	**119**
	Total	0.04	0.33	12%		Total	1.22	0.9	**136**
Bayside Cutoff	Fatal	0	0.001	0%	**Route 255 NB Loc. 9**	Fatal	0	0.001	0
	Fatal + Injury	0.04	0.06	67%		Fatal + Injury	0.31	0.24	**129**
	Total	0.10	0.14	71%		Total	0.62	0.7	89
South G St On Ramp	Fatal	0	0.003	0%	**Route 255 NB Loc. 10**	Fatal	0	0.003	0
	Fatal + Injury	0	0.22	0%		Fatal + Injury	0	0.22	0
	Total	0	0.6	0%		Total	0	0.6	0
South G St Off Ramp	Fatal	0	0.006	0%	**Route 255 NB Loc. 11**	Fatal	0	0.002	0
	Fatal + Injury	0	0.33	0%		Fatal + Injury	0	0.08	0
	Total	10.47	0.9	**1163%**		Total	0	0.25	0

Route 255 NB Loc. 1	Fatal	0	0.002	0%
	Fatal + Injury	0	0.08	0%
	Total	0	0.25	0%
Route 255 SB Loc. 2	Fatal	0	0.002	0%
	Fatal + Injury	0	0.08	0%
	Total	0	0.25	0%
Route 255 SB Loc. 12	Fatal	0	0.002	0
	Fatal + Injury	0	0.08	0
	Total	0.21	0.25	84
HIGHWAY TOTALS (INCLUDING INTERSECTIONS) [2]				
	Fatal	0	0.016	0%
	Fatal + Injury	0.16	0.54	30%
	Total	0.44	1.28	34%

1. Collisions per million vehicles.
2. Collisions per million vehicle miles.



The collision rates for the intersections are based on the number of collisions divided by the traffic volumes, including the cross street and mainline, for specified time intervals. The collision rates for the on and off ramps are based only on the volume of traffic using the specific ramp. The volumes of traffic at the intersections vary, but currently Route 101 mainline volumes are approximately 36,000 to 38,000 vehicles per day. By comparison, the ramps at South G Street are 100 to 400 vehicles per day, which increases the statistical sensitivity of collisions. The collision rate indicated for the South G Street off ramp represents two collisions in 3.5 years. The collision rate for the preceding five years was 0. The traffic volumes on the ramps at the Route 255 interchange range from 1,500 to 4,800 vehicles per day.

Despite the implementation of the Safety Corridor, Route 255 and Old Arcata Road have experienced increases in collision rates. Route 255 has also experienced an approximately 30% increase in traffic volume.

State, Regional, and Local Transportation Planning

Approved in 2006, the California Transportation Plan 2025 (CTP) is the State's official long-range transportation plan and is the policy framework for guiding transportation decisions and investments in California's transportation system through 2025. The CTP provides a common vision and a set of supporting goals, policies, and

strategies that will lead to a sustainable transportation system providing mobility for people, goods, services and information throughout the State. The CTP vision is one of a fully integrated, multimodal, sustainable transportation system that supports the three outcomes that define quality of life — prosperous economy, quality environment, and social equity. The Eureka-Arcata Corridor Improvement project was developed in accordance with the goals of the CTP.

Caltrans performs long-term transportation planning to ensure that transportation system improvements will meet future local, regional, and statewide transportation requirements. A Route Concept Report (RCR) describes the Caltrans conceptual improvement options for a given transportation route or corridor over a 20-year planning period. The RCR is also a tool for implementing local, interregional, and statewide continuity of the State's transportation network. The RCR document includes a concept or goal with supporting rationale of how the route could perform and the roadway type needed to meet highway performance objectives over the next 20 years. The Route 101 RCR, approved in 2002, includes the proposed Route 101 corridor improvement project between Eureka and Arcata.

In addition to the RCRs, the Regional Transportation Plan (RTP) is a long-range transportation planning document developed and implemented by the Humboldt County Association of Governments (HCAOG). HCAOG is a Joint Powers Agency and Regional Transportation Planning Agency (RTPA) comprised of the seven incorporated cities (Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell, and Trinidad), and the County of Humboldt. It is the designated. HCAOG is largely responsible for programming State highway, local street and road improvements, public transportation resources, and the roadside call box program.

The RTP addresses transportation system preservation as well as projected growth and congestion over the next 20 years, so that transportation improvements can be tied to need and purpose. The RTP includes identifying needed transportation improvements in sufficient detail to serve as a foundation for the development of the Regional Transportation Improvement Program (RTIP). To qualify for funding in the State Transportation Improvement Program (STIP), projects included in an RTIP must be consistent with adopted RTPs. The Eureka - Arcata Route 101 Corridor Improvement Project is included in both the RTIP and STIP.

The Eureka - Arcata Route 101 Corridor Improvement Project has been a longstanding HCAOG priority because traffic collisions that have occurred at intersections along the corridor have often resulted in serious injuries or death and substantial property damage. The HCAOG Regional Transportation Improvement Plan included a policy requesting that Caltrans construct interchanges on expressway portions of Route 101 and HCAOG requested Caltrans to initiate a Project Study Report (PSR). The PSR which has been completed provided project programming information and staff support cost estimates needed to study and evaluate a range of alternative projects to improve safety, reduce operational conflicts and reduce delay at intersections along Route 101 corridor between Eureka and Arcata.

State highway projects are funded from state and federal motor vehicle fuel taxes and truck fees. These taxes and fees fund projects listed on the State Transportation Improvement Program (STIP) and State Highway Operations and Protection Program (SHOPP). The Eureka-Arcata Corridor Improvement project is listed in both 2006 programs. HCAOG, as the regional agency, programmed and funded the environmental and design work in the STIP. Caltrans programmed the roadway rehabilitation portion of this project as part of the SHOPP. For more information regarding the STIP and SHOPP, including the planning processes, refer to HCAOG website: http://www.hcaog.net/

The highest cost alternative (Alternative 3) has an estimated 2007 cost of $62 million, including Right-of-Way costs. The rehabilitation work is programmed in the SHOPP for $31.78 million, the remainder of the work would is proposed to be funded through the STIP program. Funding from both programs requires a vote from the California Transportation Commission (CTC).

Project Study Report (PSR) and Supplemental PSR

Caltrans in coordination with the cities of Eureka and Arcata, as well as the County of Humboldt, prepared a Project Study Report (PSR), approved May 1, 2000, which identified the need for a project on Route 101 between Eureka and Arcata to improve safety and traffic operations and reduce delay at intersections. The PSR included initial project design and environmental document cost estimates for the year 2000 STIP as a Regional Improvement project.

At the request of HCAOG, Caltrans prepared a Supplemental PSR and approved it on September 14, 2000. The Supplemental PSR excluded alternatives with frontage roads from the PSR because frontage road construction would result in extensive impacts to wetlands and wildlife refuges and funding to support high mitigation costs would be unlikely. Two alternatives were carried forward to the project design and planning process. For more information regarding the PSR process, see Chapter 2.

Value Analysis Report

After completion of the PSR and Supplemental PSR, Caltrans completed a Value Analysis Report in February 2002. The Value Analysis (VA) team, which prepared the report, included both Caltrans representatives as well as representatives from various public agencies and organizations. The report included an analysis of alternatives proposed in the PSR and supplemental PSR; developed possible viable alternatives; built consensus and resolved issues with project stakeholders and transportation partners; examined reducing project costs as well as reducing life cycle costs; and validated the project need and purpose.

The VA team identified and selected performance criteria to evaluate and rank ideas. The team then chose the best alternatives from over seventy initial ideas and further developed and analyzed those. The VA team concluded that the following alternatives should be evaluated further:

- Alternative 5.0 - Close medians, eliminate left-turn movements, and improve existing right-turn acceleration and deceleration lanes. Eventually Alternative 5.0 became the basis for Alternative 1 in this document.

- Alternative 1.0 - Same as Alternative 5.0, but with a compact diamond interchange at Indianola Cutoff. Eventually Alternatives 1.0 became the basis for Alternative 2 in this document.

For more information regarding the Value Analysis process, refer to Section 2.1 - Alternatives Development Process in Chapter 2.

Resurface, restore, and rehabilitate (RRR) project

Prior to the initiation of the Route 101 corridor improvement project to improve safety, Caltrans prepared and approved a Project Scope Summary Report in 1999 to initiate a project to resurface, restore, and rehabilitate (RRR) the Route 101 roadway between Eureka and Arcata. A Value Analysis study was performed in July of 2005 to develop alternatives for value improvement to the proposed project. The VA team (excluding the team facilitators) was composed entirely of Caltrans personnel from various functional units. The VA team identified 18 alternatives or project modifications that could potentially improve performance of the project or reduce project costs. Of these alternatives, four were combined and accepted by the VA team. The VA alternative included minor cost adjustments for eliminating some reset barrier work, weed barrier under guard rails, and strengthening of guard rails to reduce the number of eucalyptus trees that would otherwise need to be removed. The substantial cost savings improvement suggested realigning the northbound Route 101 lanes toward the median to accommodate acceleration and deceleration lanes at Cole Avenue. This eliminated the need to construct retaining walls along Jacobs Avenue and minimized fill placement, thus reducing wetland and drainage impacts. Another VA alternative was accepted to add guardrail around two or three existing billboards in lieu of the higher expense of purchasing the ongoing leases from the advertising owners and the North Coast Railroad Authority advertising income. Ultimately the proposed RRR project was modified to incorporate some of the final VA recommendations.

In early 2006, during the planning phase, Caltrans with HCAOG approval, decided to shorten the rehabilitation project work limits and combine the project with the safety improvement project into one major project. All three Build Alternatives evaluated in this DEIR/S include the resurface, restore, and rehabilitation work.

Summary of Project Process to Date

The project Need and Purpose Statement presented in this Chapter was refined through a collaborative process among federal agencies as outlined in the NEPA/404 Integration Memorandum of Understanding (MOU). The MOU sets out a consultation process among designated federal agencies resulting in written concurrence in the project Need and Purpose Statement. Signatories to this project Need and Purpose Statement are FHWA, U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration – Fisheries, and U.S. Environmental Protection Agency. See Appendix E for more information regarding the NEPA/404 process.

Other projects planned or recently constructed in the vicinity

Cole Avenue Median Closure. Cole Avenue is the southernmost intersection along the expressway portion of the Route 101 corridor. The median was closed and existing acceleration and deceleration lanes were extended at the Route 101/Airport Road intersection in 2004.

Collision Abatement Program. This program began in 2000 funded by a Caltrans Office of Traffic Safety grant to reduce collisions on the North Coast through education such as airing public service announcements on television. Caltrans developed a collision abatement presentation that has been shown to high school Drivers' Education classes throughout the region. Caltrans also participated in the "55 Alive" education/awareness program at senior centers to assist in reaching out to mature drivers in the region.

Old Arcata Road/ Myrtle Avenue Widening and Rehabilitation Project. Humboldt County is proposing to complete the widening and reconstruction of Old Arcata Road/Myrtle Avenue from Eureka city limits to Arcata city limits. Old Arcata Road/Myrtle Avenue is an important collector between Eureka and Arcata that provides access to the communities of Mitchell Heights, Pigeon Point, Freshwater, Indianola, Kneeland, Maple Creek, and Bayside. Approximately 5.6 kilometers (3.5 miles) of the original 10.8-kilometer (6.7 mile) improvement project was constructed between 1978 and 1990; however, the project was never completed due to a lack of funding. The County proposes to complete the remaining 5.1-kilometer (3.2 miles) when funding becomes available.

Mad River Water Pipeline Rehabilitation Project. The Mad River Water Pipeline is an existing 610-mm (24-inch) diameter steel pipeline that was constructed mostly in the late 1930s, mainly within utility right-of-way owned by the City of Eureka. The pipeline has failed a number of times in recent years, necessitating shutdowns and jeopardizing the safety of the City's water supply. The rehabilitation project was intended to add reliability to the existing system and reduce the potential for future

failures. The existing pipeline is located east of the Route 255 interchange in Arcata and crosses Route 101 near the Eureka Mall (outside the Eureka-Arcata Corridor project limits). The pipeline rehabilitation project was recently completed along Old Arcata Road and Myrtle Avenue through the Indianola area.

City of Eureka – Route 101 (4th and 5th Streets) at V Street Project. The 4th and 5th Streets at V Street intersections are two of the more congested areas in the City of Eureka, and traffic volumes are expected to increase 35% by 2025. Roadway improvements to alleviate congestion, improve operational characteristics, improve safety, and reduce delays at this location were completed in 2004.

City of Eureka – Waterfront Drive Extension Project. The Waterfront Drive Extension Project is proposed to reduce congestion and delays, enhance safety along Broadway (Route 101) between Truesdale Street and 5th Street in Eureka, and improve accessibility west of Broadway. Broadway is currently the most congested section of roadway in Eureka, and traffic volumes are expected to increase in the future. This project proposes to construct a two-lane extension of Waterfront Drive from Del Norte Street to Hilfiker Lane. The extension of Waterfront Drive would provide an opportunity for traffic to divert from Route 101 onto a parallel roadway, to alleviate traffic congestion on Route 101.

Jacoby Creek/Gannon Slough Enhancement Project. The California Department of Fish Game has recommended that the properties containing Jacoby Creek and Gannon Slough and its tributaries be considered for acquisition and enhancement/restoration by the City of Arcata. These properties are adjacent to both the Humboldt Bay National Wildlife Refuge lands and the Arcata Marsh and Wildlife Sanctuary. Acquisition of these lands would establish a continuous corridor of local, state and federally protected lands adjacent to Humboldt Bay, totaling more than 405 hectares (1,000 acres).

Route 101 (5th Street) and R Street Improvement. This recently completed project realigned, channelized, and installed traffic signals at the intersection of Route 101 (5th Street) and R Street in the City of Eureka. The connection to and from Route 101 and State Route 255 was improved. Construction was completed in 2006.

Route 101 (4th Street) Re-striping between O and V Streets. This project would resurface and re-stripe Route 101 (4th Street) between O and V Streets in the City of Eureka. This project would increase capacity to accommodate additional traffic flow from the Route 101 (5th Street) and R Street Improvement. This project is currently in the initial project development design and planning phase.

1.4 Required Approvals and Permits

Caltrans and FHWA must jointly prepare and approve the completion of this environmental document in accordance with the California Environmental Quality

Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans will complete a Final Environmental Impact Report/Statement (FEIR/S) following public review and comment. The FEIR/S will address any comments on the draft EIR/S. Prior to approving the FEIR/S, a preferred alternative will be selected in accordance with NEPA/404 Integration Memorandum of Understanding (NEPA/404 MOU). The following Federal Agencies are participating in the NEPA/404 process: FHWA, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration - Fisheries. Caltrans and FHWA have been coordinating and will continue to coordinate with the resource agencies through meetings and the NEPA-404 integration process. See Appendix E for more information about NEPA/404 process.

A Notice of Determination will be filed with the California State Clearinghouse that CEQA review has been completed for this project. In compliance with CEQA, Caltrans will prepare a Statement of Overriding Considerations if the proposed project results in one or more unavoidable significant environmental impacts. The FHWA would prepare a Record of Decision (ROD) describing why the preferred alternative was chosen.

Numerous federal and state environmental laws and regulations are applicable to this project and are identified and discussed in Chapter 3 of this document. By various mandates, the environmental notification, review, consultation, and coordination process with other agencies has included, and will continue to include, the following public agencies/organizations:

U.S. Fish and Wildlife Service
California Office of Historic Preservation
U.S. Environmental Protection Agency
U.S. Army Corps of Engineers
National Oceanic and Atmospheric Administration (NOAA) – Fisheries
U.S. Coast Guard
California Department of Fish and Game
Regional Water Quality Control Board
California Coastal Commission
State Lands Commission
County of Humboldt
City of Eureka
City of Arcata
Table Bluff Reservation Rancheria (Wiyot Tribe)
Humboldt Bay Harbor Recreation and Conservation District

The following separate regulatory approvals, permits, agreements, and consultations from public agencies must be issued before construction can commence:

Section 404 Permit. Implementation of the Corridor Improvement Project could result in the filling of wetlands and other Waters of the United States. The U.S. Army Corps of Engineers (USACE) regulates the Nation's waterways and wetlands, and is responsible for implementing and enforcing Section 404 of the federal Clean Water Act (CWA). USACE regulations require that any activity that discharges material or requires excavation in "Waters of the United States," including wetlands, must obtain an Individual Section 404 permit for projects that would permanently fill more than 0.2-hectare (0.5-acre).

Section 401 Water Quality Certification. The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB) promulgate and enforce narrative and numeric water quality standards in order to protect water quality and adopt and approve Water Quality Control Plans. The SWRCB and the RWQCBs also regulate discharges of harmful substances to surface waters, including wetlands, under the federal CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne). If issuance of a Section 404 permit is required, it will be subject to water quality certification under CWA Section 401.

Waste Discharge Requirements. Under the Porter-Cologne Act, the RWQCBs regulate the discharge of "waste" into "waters of the state." Water Code Section 13260 requires "any person discharging, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge." A report of waste discharge (RWD) is essentially an application for waste discharge requirements (WDRs). WDRs contain conditions imposed on a given discharge by the appropriate RWQCB for the purpose of protecting the beneficial uses of the waters of the State.

Section 7 Consultation. The Federal Endangered Species Act requires a Federal agency to consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration - Fisheries (NOAAF) for species listed as Threatened or Endangered, or proposed for listing as Threatened or Endangered. Based on this consultation, the USFWS and/or the NOAAF issues a biological opinion determining whether the project is likely to adversely affect or jeopardize the continued existence of a federally listed species, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species.

Essential Fish Habitat. The 1996 amendments to the Magnuson-Stevens Act set forth a number of new mandates for the National Oceanic and Atmospheric Administration – Fisheries (NOAAF), eight regional fishery management councils (Councils), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NOAAF, are required to delineate Essential Fish Habitat (EFH) for all managed species. Federal agencies, which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NOAAF regarding the potential effects of their actions on

EFH, and are required to respond in writing to NOAAF recommendations. The proposed project is located within an area designated as EFH for Pacific Salmon.

Section 106 Compliance. For projects with federal funding, the National Historic Preservation Act of 1966 (NHPA), as amended by 16 United States Code (USC) Section 470 et seq.; Section 106; 36 Code of Federal Regulations (CFR) 800, includes provisions for protection of significant archaeological and historical resources. Procedures for dealing with previously unsuspected cultural resources discovered during construction are identified in 36 CFR 800 (for implementing Section 106 processes). The administering agency is the State Historic Preservation Officer (SHPO) and the Federal Highway Administration (working in cooperation with Caltrans).

Coastal Development Permits. Pursuant to the California Coastal Act of 1976, any proposed development within the Coastal Zone requires a Coastal Development Permit. The Coastal Act was established to protect public and private property, wildlife, marine fisheries, other ocean resources, and the natural environment. For this project, Coastal Development Permits will be required from the State and County of Humboldt and the City of Arcata since this project lies within the three Coastal Zone agency jurisdictions.

NPDES Permit. The National Pollutant Discharge Elimination System (NPDES) permit system was established in the Clean Water Act to regulate municipal and industrial discharges to surface Waters of the U.S. The statewide NPDES permit issued to Caltrans contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding the NPDES permit.

California Department of Fish and Game. Section 1602 of the California Fish and Game Code requires a Stream Alteration Agreement from the California Department of Fish and Game (CDFG) for activities that would divert, obstruct or change the natural flow or adversely affect the bed, channel or bank of a stream and its associated fish and wildlife values, including contiguous riparian habitat.

California Department of Fish and Game Consistency Determination. A California Endangered Species Act (CESA) consistency determination may also be required for proposed project work within Coho salmon habitat.

Humboldt Bay Harbor Recreation and Conservation District. A permit from this agency is required for bridge construction work at Jacoby Creek and Gannon Slough.

Other Permits and Approvals. Other permits and approvals, such as encroachment permits, from federal, state, and local agencies may be needed for implementation of project mitigation.

Chapter 2 Project Alternatives

2.1 Alternatives Development Process

This chapter describes how alternatives were developed for consideration for the proposed Route 101 Corridor Improvement Project from the Eureka Slough Bridge to the 11th Street overcrossing in Arcata (kilometer post 128.6 to 138.9 or post mile 79.9 to 86.3). This chapter also discusses project alternatives that were initially considered but withdrawn from consideration and the reasons for their withdrawal.

Project Study Report and Supplemental Project Study Report

As described in Chapter 1, Route 101 corridor improvements between Eureka and Arcata have been a long-standing priority of the Humboldt County Association of Governments (HCAOG). In response to HCAOG, Caltrans developed a Project Study Report (PSR), which documented the existing and projected need for the project and began the alternative development process for a project that would improve safety and highway operations within the Route 101 corridor. In May 2000, Caltrans approved the PSR, which identified the need for a project on Route 101 between Eureka and Arcata to improve safety at intersections, reduce operational conflicts along the corridor, and reduce delays at intersections. The PSR included initial project design and environmental document cost estimates. The project limits for these safety improvements extend from Eureka Slough Bridge (kilometer post 128.6 or post mile 79.9) in the south to the Bayside Cutoff (kilometer post 135.5 or post mile 84.4) to the north.

The initial PSR evaluated nine alternatives and identified four that met the project need and purpose:

- **X1 Alternative** – Conversion to four lane freeway, with an interchange at Indianola Cutoff, frontage roads, closure of all median openings, and a new bridge from 6th Street to Jacobs Avenue over the Eureka Slough. The approximate cost would be $132,000,000 in year 2000 dollars.

- **X5 Alternative** – Similar to X1, except that the Route 101 roadway would be a structure from Mid-City Motor World to Bracut, so the frontage road could be located under the structure. The approximate cost would be $305,000,000 in year 2000 dollars.

- **Y3 Alternative** – Improve right-turn acceleration/deceleration lanes, close all median openings, and widen shoulders. The approximate cost would be $18,000,000 in year 2000 dollars.

- **Y4 Alternative** – Similar to Y3, but includes an interchange at Indianola Cutoff. The approximate cost would be $31,000,000 in year 2000 dollars.

The results of these efforts were shared with the community in public workshops.

In September 2000, Caltrans prepared a Supplemental PSR at the request of HCAOG. The Supplemental PSR further reduced the range of alternatives to be studied due to predicted extensive environmental impacts and the likely unavailability of funding to support the large construction and mitigation costs of certain alternatives. On these grounds, alternatives proposed for full upgrade to freeway (i.e. with frontage roads) were eliminated and therefore, the range of Build Alternatives was narrowed to two:

1. An alternative that proposed closing all the median openings and extending the acceleration and deceleration lanes at existing intersections for right-turn only movements (Alternative Y3). This alternative would not include an interchange, additional Eureka Slough crossing, or frontage roads. This alternative eventually evolved to become Alternative 1 in this Environmental Impact Report/Statement.

2. The second alternative included the above project elements but in addition included constructing a compact diamond interchange at Indianola Cutoff (Alternative Y4). This alternative eventually evolved to become Alternative 2 in this Environmental Impact Report/Statement.

Value Analysis Process

Due in part to community comments obtained during project scoping and requirements set by FHWA, Caltrans embarked on an effort to further explore possible alternatives that would resolve the safety concerns that had been identified. This effort, known as Value Analysis, involved the participation of members from the City of Eureka, County of Humboldt, and California Department of Fish and Game in addition to a member of the community. In addition to the people participating on the Value Analysis team brainstorming and preparing alternatives, presentations were made to resource and regulatory agency staff as well as City and County staff (including the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, California Coastal Commission, National Oceanic and Atmospheric Administration - Fisheries (NOAAF), HCAOG, City of Arcata Public Works, County Planning and Public Works Departments) as well as to Eureka Police Department, California Highway Patrol, Table Bluff Reservation Rancheria, Federal Highway Administration, and the general public. This effort was concluded in February 2002. The Value Analysis team analyzed the alternatives proposed in the PSR and Supplemental PSR; brainstormed and developed other viable alternatives; worked towards consensus; resolved issues with project sponsors to reduce project costs and

develop solutions to difficult transportation problems; and, validated the project need and purpose.

The VA team then identified and agreed upon the following performance and weighting criteria to use to evaluate and rank ideas:

- Safety improvements (28% weight),
- Mainline operation (19% weight),
- Adjacent area impacts (17% weight),
- Biological impacts (17% weight),
- Environmental (archaeological, visual, air quality, energy consumption and aesthetic) impacts (12% weight),
- And route system impacts (7% weight).

The team then brainstormed and evaluated (using the performance criteria) over 70 ideas and evaluated them against the Y4 alternative from the PSR. The Y4 alternative scope included closing median openings, constructing an interchange at Indianola Cutoff at Route 101, improving right-turn acceleration and deceleration lanes, and widening existing shoulders. The PSR Y4 alternative was estimated to cost approximately $31,330,000 (Year 2000 cost estimate) and meet the project need and purpose. The team then chose the best alternatives from the 70 initial ideas and further developed and analyzed those. Some ideas were combined to form one alternative. The VA alternatives presented to the PDT members included:

- Eliminate shoulder widening from the project;
- Construct Eureka to Arcata frontage road with a 6th Street bridge over Eureka Slough;
- Construct Eureka to Indianola frontage road with a 6th Street bridge spanning the Eureka Slough;
- Implement traffic systems management and expand public transit;
- Use pace cars to create traffic gaps for turns at intersections;
- Eliminate all median openings with no interchange;
- Y4 alternative with fly-over interchange at Indianola (includes roundabout);
- Y4 alternative with a single point interchange;
- Y4 alternative with a roundabout interchange;
- Y4 alternative adding a southbound Jacobs Avenue hook ramp;
- Implement mass transit that would serve all future project traffic volumes increases and thus maintain the existing Average Daily Traffic.

The VA team and PDT concluded that the following alternatives should be evaluated further:

- VA Alternative 5.0 - Close medians, eliminate left-turn movements, and improve existing right-turn acceleration and deceleration lanes. This

Alternative was a refinement of the PSR Alternative Y3 with the shoulder widening eliminated.

- VA Alternative 1.0 - Same as Alternative 5.0, but with a compact diamond interchange at Indianola Cutoff. This alternative is the same as PSR Alternative Y4, but without shoulder widening.
- VA Alternative 6.4 – Same as Alternative 1.0, but with a single point interchange design option.
- VA Alternative 6.2 - Same as Alternative 1.0, but with a roundabout interchange design option.

Eventually Alternatives 5.0 and 1.0 became the basis for Alternatives 1 and 2 in this document, while Alternatives 6.4 and 6.2 were eventually dropped, because they would have greater wetland impact than Alternative 1.0 and no additional operational advantages.

After the VA process concluded, a public information meeting was held on May 15, 2003 to present these two alternatives and the No-Build Alternative to the public. At that time a group of individuals representing businesses within the Route 101 corridor designated themselves as the "101 Corridor Access Project Group" (101 CAP) made presentations to HCAOG regarding concerns about adverse impacts to their businesses as a result of closing the medians. Consequently, HCAOG requested Caltrans to evaluate alternatives that included signalization of Route 101 at Airport Road. Thus, Alternative 3 was included, which consists of the same project elements as Alternative 2 but with an addition of a signal at Airport Road.

The NEPA/404 Integration process is a third process, in addition to the PSR and Value Analysis processes, required to develop and evaluate project alternatives. Because this project would exceed two hectares (five acres) of permanent impacts to Waters of the U.S. and requires the preparation of an Environmental Impact Statement, Caltrans is subject to the requirements of the April 2006 NEPA/404 Integration Memorandum of Understanding (NEPA/404 MOU). This MOU requires that Caltrans and the FHWA obtain formal concurrence from the following agencies on the stated need and purpose of the project as well as on the range of alternatives developed: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration - Fisheries (NOAAF), and U.S. Environmental Protection Agency. These agencies have provided their concurrence on the current range of alternatives. See Appendix E for more information regarding the NEPA/404 process.

Resurface, restore, and rehabilitate (RRR) work

In early 2006, a project to resurface, restore, and rehabilitate (RRR) the Eureka-Arcata Route 101 corridor was combined with the safety improvements previously discussed. The major elements of the RRR work include: extending or constructing acceleration and deceleration lanes; replacing southbound Jacoby Creek Bridge; and,

widening northbound Jacoby Creek and Gannon Slough Bridges. This major maintenance work would be needed regardless of the implementation of the initial proposed Route 101 corridor improvement project (described as Alternatives Y3 and Y4 described earlier in this chapter) in order to bring the roadway facility up to current design standards as well as extend the serviceable life of the existing roadway. Thus, the RRR work has been added to each of the Build Alternatives. See the Section 2.2 in this chapter for a complete project description.

Because most of the RRR work is proposed within the project limits of the overall Route 101 Corridor Improvement project, there are many advantages achieved by combining the two sets of improvements, including the following:

- **Minimize wetland impacts.** The RRR work as a stand-alone project would have included extending the existing left-side acceleration and deceleration lanes, and in turn, filling wetland within the Route 101 median. By combining the RRR job with the Corridor Improvement project, the left-side lane work was eliminated.

- **Combining the projects would simplify coordination with public agencies since the agencies would evaluate the project once as a whole rather than piecemeal.** Public agencies can more efficiently evaluate cumulative potential impacts of a combined project. In addition, regulatory processes such as compliance with Section 106 of the National Historic Preservation Act would be more efficient for a combined project.

- **Minimize construction activities.** If the two projects were constructed separately, construction equipment would likely be required to mobilize on two different occasions within the same area. Combining the project would allow one construction contractor to efficiently mobilize equipment.

- **Achieve efficient traffic management during construction.** Combining the project simplifies traffic handling/management during the construct period. Constructing the two separate projects would have resulted in longer traffic delays/detours during construction.

- **Achieve a higher degree of compliance with the Federal Highway Administration policy of setting logical project termini of sufficient length to address environmental matters on a broad scope.** By combining two otherwise separate projects, the project limits or termini, encompass both projects.

- **The combined project would possess a higher degree of independent utility i.e., a stand-alone project and reasonable expenditure even if no additional transportation improvements in the area are made.** Both independent utility and logical project termini ensure meaningful evaluation

of alternatives and avoid commitments to transportation improvements before they are fully evaluated.

Alternative Selection Criteria

All proposed alternatives were evaluated against conformance criteria described below to determine if the alternative meets the project Need and Purpose for the project.

Safety Conformance Criterion: Project reduces the number of fatal plus injury collisions at each intersection to below the existing Statewide average number of fatal plus injury collisions for traffic volumes projected to the year 2031.

Operational Conflicts Conformance Criterion: No uncontrolled merge movements from the left and no movements crossing Route 101 mainline.

Level-of-Service (LOS) Conformance Criterion: Maintain a LOS D or better for Route 101 mainline (through lanes) and for each movement at non-signalized intersections, and an overall LOS C or better at signalized intersections.

Rehabilitation Criteria

After the roadway rehabilitation work was combined with the safety project to close Route 101 medians, a Rehabilitation Conformance Criterion was developed to determine if alternatives met the Need and Purpose for the project: rehabilitation improvements shall include improvements that will extend the life of the Route 101 roadway by a minimum of ten years. The projected life of the proposed improvements is expected to certainly exceed ten years.

Evaluation Criteria

The three alternatives that meet all the Alternative Selection Criteria are discussed in detail in this environmental document. The environmental evaluation criteria that follow provide a basis to identify the least environmentally damaging practicable alternative. The environmental review process summarized in this document discusses a full range of potential environmental effects—both adverse and beneficial:

- Wetlands and other regulated waters;
- Listed Threatened and Endangered Species and other sensitive biological resources;
- Public wildlife refuge/management lands;
- Agricultural lands;

- Residences (including Environmental Justice communities—see Section 3.1.4 in Chapter 3 for discussion);
- Businesses;
- Growth inducement potential;
- Local and regional land use planning;
- Public facilities (airport, railroad, etc.);
- Scenic resources;
- Coastal resources;
- Traffic (includes Route 101 and alternate routes Old Arcata Road and Route 255);
- Cultural Resources (includes historic and archaeological resources);
- Hazardous waste;
- Consistency with goals of the Caltrans Route Concept Report & Regional Transportation Plan;
- Temporary impacts from noise during construction;
- Water quality and flooding.

2.2 Project Alternatives

In all, nineteen alternatives have been developed via the various scoping efforts and analyzed during the project design and planning process. Of these, three Build Alternatives have been identified by the Project Development Team as meeting the stated Need and Purpose for the Project and are included in this environmental document along with the No-Build Alternative. The project limits are the same for the three alternatives and were set to be a reasonable length to best meet the Need and Purpose of improving traffic safety, intersection Level-of-Service, and extending the serviceable life of the roadway.

A preferred alternative will be determined after the public circulation and comment period of this Draft Environmental Impact Report/Statement and a public hearing. The three Build Alternatives and the No-Build Alternative are described as follows: (See Plan Sheets in Appendix A.)

Alternative 1 - Resurface, restore, and rehabilitate (RRR) with median closures

This alternative consists of the following:

1. Extend or establish the existing Route 101 right-side acceleration lanes and deceleration lanes at the following intersection locations listed from south to north in Table 2-1.

Table 2-1 Proposed Right-Turn Acceleration and Deceleration Lane Work Locations		
Route 101 Intersection Name	**Location of lanes**	**Work description**
Cole Avenue	East side of Route 101	Extend both acceleration and deceleration lanes to 480-meters (1,575-feet) and 260-meters (853-feet), respectively; this requires partial realignment of the northbound Route 101 lanes toward the median. Shoulders would be widened to 2.4-meters (eight-feet) wide. Several trees would need to be removed from the clear recover zone. Roadway lighting would need to be added or upgraded to conform to current highway design standards.
Mid-City Motor World	East side of Route 101	Extend both acceleration and deceleration lanes to the same dimensions proposed at Cole Avenue.
Simpson Sawmill	West side of Route 101	Establish acceleration and deceleration lanes to the same dimensions as Cole Avenue. Lane improvements would necessitate removal of approx. 300 eucalyptus trees. The existing drainage ditch between the highway and the railroad would require a slope easement from the North Coast Railroad Authority. Paved improvements would remain within the existing highway right-of-way.
Indianola Cutoff	East side of Route 101	Extend both acceleration and deceleration lanes to 480-meters (1,575-feet) and 260-meters (853-feet); Shoulders would be widened to 2.4-meters (eight-feet) wide. **The work description at this location only applies to Alternative 1.**
Bracut	Both sides of Route 101	Extend or establish both acceleration and deceleration lanes to 480-meters (1,575-feet) and 260-meters (853-feet); shoulders would be widened to 2.4-meters (eight-feet) wide. The acceleration and deceleration lane work on the west side would require a slope easement from the North Coast Railroad Authority. Paved improvements would remain within the existing highway right-of-way. Additional lighting required to conform to these improvements. Underground telephone lines would need to be relocated on the west side of Route 101.
Bayside Cutoff	East side of Route 101	Extend or establish both acceleration and deceleration lanes to 400-meters (1,312-feet) and 240-meters (787-feet); shoulders would be 2.4-meters (eight-feet) wide. Additional lighting required to conform to these improvements.

2. Close all remaining Route 101 median crossings consisting of: Airport Road, Mid-City Motor World, Simpson sawmill, Indianola Cutoff, Bracut, and Bayside Cutoff. The existing median paving would be removed.

3. Install thrie-beam median safety barrier and weed barrier between the Eureka Slough bridges and Airport Road.

4. At the existing Route 101/255 interchange in Arcata, remove existing curbs adjacent to the right side edge of traveled way of each of the ramp lanes; reshape

adjoining shoulders to conform to the slope; overlay all ramps and auxiliary lanes with new asphalt-concrete.

5. Place asphalt-concrete overlay from Eureka Slough Bridge to 11th Street in Arcata. Place shoulder backing (a minimum of one-meter or three-feet wide) adjacent to the paved surfaces.

6. Replace southbound Jacoby Creek Bridge. This bridge is over eighty years old and is structurally and functionally obsolete. A temporary detour will be required to allow two lanes to remain open to traffic in each direction during construction.

7. Widen northbound Jacoby Creek and Gannon Slough Bridges to maintain the minimum width of 1.5-meter (five-feet) left shoulder, two 3.6-meter (12-feet) wide lanes and 2.4-meter (eight-feet) wide right shoulder; upgrade bridge rail on those bridges, and install standard bridge rail for all of the bridges to be widened or replaced, with a bicycle railing installed on the right side.

8. Replace all existing tide gates within the project limits. The existing tide gates were installed in 1954 and are in poor condition requiring repair at an increasing rate. The replacement work includes a tide gate for Jacobs Avenue drainage at the Eureka Slough; dual tide gates near Airport Road; one adjacent to Mid-City Motor World; one at Brainard Slough; one at Old Jacoby Creek; and a triple gate at Gannon Slough. Fish passage will be considered at each of the locations. Note: Tide gates are not part of the Route 101 roadway, however, tide gates function to minimize flooding of adjacent low elevation lands.

9. Add or replace roadway lighting on mainline Route 101 at Cole Avenue, Indianola Cutoff, Bracut, Bayside Cutoff, South G Street, and the Route 101/255 Interchange; trenching would be required to place new subsurface electrical conduit between the lights.

10. Install metal beam guardrail with the appropriate end treatments at two to three billboards adjacent to the southbound lane (south of Bracut within existing highway right-of-way) to protect errant vehicles from striking these fixed objects (billboards). (The existing billboards are outside of the existing state highway right-of-way, but are within the nine-meter (thirty-feet) clear recovery zone.) The North Coast Railroad Authority has initiated discussion/plans for possible removal of the three billboards.

11. Remove existing large trees within the corridor that are within the nine-meter (thirty-feet) clear recovery zone.

12. Replace existing thrie beam median barrier with concrete median safety barrier from South G Street to the 11th Street Overcrossing in Arcata, which also includes weed control measures.

13. Remove Safety Corridor signage within the Safety Corridor from the Eureka Slough Bridge to Gannon Slough and raise the posted speed limit to 65 mph.

Typical roadway cross sections are located in Appendix A.

- Extending acceleration and deceleration lanes at the Simpson Mill and at Bracut would require permanent easement from the North Coast Railroad Authority. (See Plan Sheets 7-9 and 14-16 in Appendix A.)

Alternative 1 would meet the project Need and Purpose as follows:

- **Improve safety at intersections.** The primary purpose of the Corridor Improvement Project is to improve safety and reduce the number and severity of fatal and injury collisions by modifying how traffic enters and exits Route 101 at intersections along the Eureka to Arcata corridor between KP 128.6 to 138.9 (PM 79.9 to 86.3). The most serious collisions are the result of left-turn movements across Route 101. This Alternative would close the medians and eliminate all left-turn movements.

- **Reduce operational conflicts along the Route 101 corridor.** The secondary purpose of the proposed project is to reduce operational conflicts, which are often the result of left-turns and left-merge on and off movements at median crossings within the Route 101 Corridor. Operational conflicts can lead to driver confusion and therefore increase collisions. Alternative 1 would eliminate both left-turn movements and traffic entering from the left side of the roadway.

- **Reduce delay at intersections along the Route 101 corridor.** Alternative 1 would reduce delay at intersections primarily by eliminating left-turn movements. After project implementation, vehicles would no longer wait for a traffic gap to turn left. In addition, traffic congestion at intersections created by vehicles attempting to slow down or accelerate while turning at intersections sometimes occurs. Extending the deceleration and acceleration lanes would improve drivers' ability to adjust their vehicle speed while exiting or entering Route 101 at intersections.

- **Resurface, restore, and rehabilitate the pavement and roadway.** Alternative 1 would extend the service life of the existing Route 101 roadway pavement within the project limits thereby reducing maintenance costs.

- **Meet current highway design standards for safety where feasible.** Alternative 1 would upgrade to minimum width standards and safety standards for bridges and roadway elements that currently do not meet current traffic design standards.

Total estimated cost of Alternative 1 in 2006 dollars is $30 million requiring 0.97 hectare (2.39 acres) of easement (NOTE: Any additional Right-of-Way requirements for wetland mitigation have not been determined.)

Alternative 1 – Consequences Summary (See Chapter 3 for detailed discussion)

- Would substantially enhance safety by eliminating left-turns and confusing left turn traffic merging at intersections;
- Would removes Safety Corridor signage, etc. which may bring vehicles that had diverted to Route 255 (through the community of Manila) back to Route 101, see Safety Corridor discussion in Section 3.1.6 – Traffic, Transportation/Pedestrian, and Bicycle Facilities in Chapter 3;
- Would substantially change access to businesses and residences creating impractical out-of-direction travel and delay; see Table 3-2 – Round Trip out-of-direction travel distances in Section 3.1.6 – Traffic, Transportation/Pedestrian, and Bicycle Facilities in Chapter 3;
- Would create substantial economic hardship on businesses and residents, for this reason Alternative 1 is strongly opposed by a high number of residents and business owners along the Route 101 corridor between Eureka and Arcata, see Section 3.1.1 Land Use, Community, Businesses in Chapter 3;
- Would create substantial additional energy use (and air pollution) over that of Alternatives 2 or 3, see Section 3.2.7 – Energy in Chapter 3;
- Would substantially increase traffic volumes on Old Arcata Road which would likely necessitate the need for new improvements to that facility (such as shoulder widening and left turn lanes) see Table 3-15 – Projected increase in traffic volumes in Section 3.1.6 - Project Effects on Local Road and Intersections in Chapter 3;

Alternative 2 - RRR Project With Median Closures and Interchange at Indianola Cutoff

Alternative 2 includes all of the elements of Alternative 1 with the exception that a compact diamond interchange with an Indianola Cutoff under crossing is proposed. This Alternative requires a temporary construction easement near Indianola Cutoff for traffic handling during the interchange construction. (See Plan Sheets 10-13 in Appendix A for locations.)

The on-ramps at the proposed Indianola Cutoff interchange would be approximately 800-meters (2,600 feet) long, and the off-ramps would be approximately 600-meters (1,968-feet) long. The Route 101 through lanes would be elevated approximately 7.6-meters (25-feet) above Indianola Cutoff and would have separate north and southbound bridges approximately 34-meters (112-feet) long with paved widths of 11.7-meters (38-feet). The median width through the interchange would be reduced to fourteen-meters (fifty-feet) and include median barrier installation. Stop signs would be placed at the northbound and southbound Route 101 off-ramps at Indianola Cutoff.

Roadway lighting would be installed at exit and entrance ramps as well as the intersections of the ramps connecting to Indianola Cutoff. The electrical service would likely be at the intersection of the Indianola Cutoff, and the northbound ramps, and conduit would be trenched from the service location to the lights.

Construction activities would require the same easements as Alternative 1, except at the proposed Route 101/Indianola Cutoff interchange. Construction activities would require a temporary detour on Railroad property to be removed after completion. The interchange will not have permanent improvements outside of the existing highway right-of-way. Temporary construction easement would also be needed to accommodate traffic detour during construction of the interchange.

Like Alternative 1, Alternative 2 would also meet the minimum project Need and Purpose. However, traffic operations for Alternative 2 would be superior to Alternative 1 since the interchange would substantially minimize out-of-direction travel after the medians are closed. Effects to local roads, such as Old Arcata Road, would be minimal compared to Alternative 1. The interchange would result in more permanent filling of wetlands than Alternative 1. This issue is discussed in detail in Section 3.3.2 in Chapter 3.

Total estimated cost of Alternative 2 in 2006 dollars is $55 million requiring 0.97 hectare (2.39 acres) of easement
(NOTE: Any additional Right-of-Way requirements for wetland mitigation have not been determined.)

Alternative 2 - Consequences Summary (See Chapter 3 for detailed discussion)

Alternative 2 would have similar consequences as Alternative 1 except as follows:

- Would result in approximately 5.36 hectares (13.25 acres) of permanent wetland impacts.
- Although access to businesses and residences would be restricted, the proposed interchange included in Alternative 2 would substantially reduce

out-of-direction travel, delay, and additional energy use when compared to Alternative 1.

- Alternative 2 would not degrade Level-of-Service on Old Arcata Road beyond the No-Build Alternative.

- By improving highway access, this alternative would remove one impediment to growth through re-development at the Route 101/Indianola Cutoff.

Alternative 3 - RRR Project With Median Closures and Interchange at Indianola Cutoff and Signalized Intersection at Airport Road

Alternative 3 includes all of the elements of Alternative 2 except that instead of closing the median at Airport Road, Airport Road would be realigned and signalized at Route 101. Airport Road would provide dedicated lanes for both left and right-turning vehicles. A left-turn pocket would be provided for southbound Route 101 traffic turning left to Airport Road, and would allow for truck U-turns. U-turns for passenger vehicles would be allowed from both directions. Furthermore, speed for southbound traffic approaching the intersection would be reduced north of the intersection with Airport Road. Reduced speed for northbound Route 101 traffic would be maintained from V Street in Eureka to Airport Road. When simply comparing current statewide average collision rate groups, the Safety Conformance Criterion is not met with the installation of a traffic signal at any intersection within the corridor. However, collision rates can be reduced at signalized intersections with the addition of carefully planned and appropriately designed safety countermeasures. Features such as rumble strips, ITS (Intelligent Transportation System) technology and Red Light Run Photo Enforcement, if supported and funded by the City of Eureka, could be used at this location to meet safety conformance criteria.

Due to the close proximity of the intersections of Airport Road/Route 101 and Airport Road/Jacobs Avenue, Airport Road will be relocated to the north to improve traffic operational efficiency. The relocation will require realigning Airport Road outside of the existing State right-of-way, across the end of an abandoned runway, and across the existing ditch east of Route 101 to a new intersection location on Route 101. Construction work outside of the existing State right-of-way would require an encroachment permit from the County of Humboldt.

An additional lane would be constructed from the Cole Avenue acceleration lane to Mid-City Motor World to maintain LOS C on Route 101. To minimize impacts to wetlands and existing drainage patterns, a retaining wall would be required for a portion of the lane between Jacobs Avenue and Airport Road. The widening for the additional lane north of the Airport Road intersection would occur within the median to avoid any further encroachment into the airport's flight approach/departure surface.

The additional lane would make a transition to the deceleration lane to exit Route 101 at Mid-City.

Total estimated cost of Alternative 3 in 2006 dollars is $62 million requiring 0.97 hectare (2.39 acres) of easement (NOTE: Any additional Right-of-Way requirements for wetland mitigation have not been determined.)

Alternative 3 - Consequences Summary (See Chapter 3 for detailed discussion)

Alternative 3 would have similar consequences as Alternative 2 except that signalizing Airport Road at Route 101 would provide substantially better access for most of the businesses and residences along the Route 101 corridor, thereby reducing out-of-direction travel, delay, and additional energy use when compared to Alternatives 1 and 2. However, Alternative 3 would result in permanently filling of 6.24 hectares (15.41 acres) wetlands.

Alternative 7 – No-Build

Alternative 7 is the No-Build Alternative. This alternative retains the current Route 101 roadway alignment and intersection access (including median openings). The existing Safety Corridor signage, posted 50-mph speed limit, and daylight use of headlights section would also remain until conditions warranted removing or modifying the Safety Corridor elements. The existing Safety Corridor lacks the double fine zone for speeding, enhanced public education, and increased traffic enforcement, which were previously part of the Safety Corridor.

The Safety Corridor was implemented as a temporary measure to reduce the intersection collision rate between the Eureka Slough Bridges and the Jacoby Creek Bridges until permanent, long-term improvements could be constructed. Future funding is uncertain for increased traffic enforcement and public education/awareness programs to reinforce compliance with the Safety Corridor elements. State legislation was required to impose double the fine for speeding violations in 2003 within the Eureka-Arcata corridor. The legislation expired on January 1, 2006, which ended the double fine zone, and attempts to extend the legislation or reinitiate the legislation have been unsuccessful. Public education, increased traffic enforcement, and double fine zone all contributed to the initial effectiveness of the Safety Corridor. Without additional enhanced traffic enforcement, average traffic speeds have been steadily increasing and are expected to continue to increase within the Safety Corridor.

Although the overall number of collisions has substantially decreased during the first two years of the Safety Corridor implementation, the fatal plus injury collision rate at Indianola Cutoff remains at almost twice the Statewide average. Moreover, a review of safety corridors on other highways within the State has shown that their

effectiveness is short lived. Among the explanations for this loss of effectiveness given by traffic safety engineers is the phenomenon of habituation: consequently warning signs, which rely upon driver alertness and attentiveness, are not in the long-term meaningful substitutes for permanent structural improvements using the latest design standards. After an initial enhanced enforcement period (ranging one to three years of enhanced enforcement and public awareness campaigns), the collision rates in these safety corridors have approached the pre-safety corridor implementation collision rates.

Despite the Safety Corridor, as traffic volumes and speed increases in the corridor, traffic collisions are expected to increase. Under the California Motor Vehicle Code, posted speed limits on State expressways must be set at or near the 85th percentile speed, which is defined as that speed at or below which 85th percent of the traffic is moving. Prevailing traffic speeds are measured with radar in free-flow conditions generally every seven years. In 2006, the average 85th percentile in the corridor was 54 mph. Therefore, if the prevailing speed increases, as projected overtime, the posted speed could not continue to be 50 mph**.** The annual average daily traffic in the year 2002 was 35,000 vehicles and is projected to increase to 47,600 and 54,600 vehicles in the years 2020 and 2030, respectively.

Without safety improvements intended to reduce collisions related to median crossings within the corridor, collision rates are expected to increase back to pre-safety corridor levels, regardless of an extended enhanced enforcement period.

In addition to safety concerns, there are Level-of-Service concerns for non-signalized left-turns on to, and off of, Route 101 which are currently allowed at all intersections, except Cole Avenue. The year 2031 Level-of-Service (LOS) for left-turns onto Route 101 is F for the No-Build Alternative, except at the Simpson sawmill intersection. Non-signalized left-turns off of Route 101 are below LOS D at Indianola Cutoff and are at or better than LOS D for the remaining intersections. As traffic volumes increase over time, the number of vehicles waiting to make left-turns at the median openings will increase along with higher traffic speeds and volumes on Route 101 through lanes resulting in further reducing the effectiveness of the Safety Corridor.

Even though the No-Build Alternative does not propose any roadway changes, traffic volumes and speeds are expected to increase in the future. If a long-term project were not implemented, one or more median closures would likely still be necessary as safety issues arise resulting from increased traffic volumes and speeds. Closing one or more medians could potentially restrict access to businesses and residents; add out-of-direction travel and delay; increase fuel consumption; and adversely affect the Level-of-Service of local streets as well as State Route 255.

Finally, the No-Build Alternative would not improve the existing acceleration/deceleration lanes and three of the existing bridges within the project limits that do not meet current highway design standards. In addition, the Route 101 roadway pavement is deteriorating and maintenance costs will rise as the pavement

deteriorates. The fixed objects within the roadway clear recovery zone would remain potential hazards for vehicles making emergency maneuvers and for errant vehicles.

Based on these findings, Alternative 7 does not meet the project Need and Purpose. The No-Build Alternative is evaluated in this document as a basis for comparison with the Build Alternatives even though it does not meet the project Need and Purpose. The No-Build Alternative would avoid any immediate environmental impacts or costs. Other projects to maintain the road will be initiated as needed.

For more No-Build Alternative information, refer to Chapter 3, Section 3.1.6 Traffic, Transportation/Pedestrian and Bicycle Facilities. This section includes a description of the existing and future conditions without any major Route 101 corridor improvement work.

Alternative 7 - Consequences Summary
(See Chapter 3 for detailed discussion)

- Left-turns and confusing traffic merging at intersections would remain as well as the posted existing 50 mph speed limit between the Eureka Slough and Gannon Slough Bridges;

- No wetland impacts;

- Based on Route 101 traffic trends between Eureka and Arcata, both vehicle speeds and volumes on Route 101 are predicted to increase: consequently in the foreseeable future, deteriorating highway conditions will likely necessitate closing one or more Route 101 median openings to maintain safety and minimize collisions. One or more median closures would restrict access to businesses and residences and result in out-of-direction travel, increased energy consumption and travel delay and the Level-of-Service on Old Arcata Road could substantially degrade;

- Trees and unshielded billboards would remain within the clear recovery zone on the east side of Route 101; and eucalyptus trees in very close proximity to guardrail would remain;

- No effect to Threatened or Endangered Species;

- The existing Route101/255 interchange ramps; existing acceleration/deceleration lanes; and three of the existing bridges within the project limits would continue to not meet current highway design standards in terms of adequate width, length, barrier, or bridge rail standards. The southbound Jacoby Creek Bridge is also structurally obsolete. In addition, the pavement is deteriorating and maintenance costs will rise as the pavement continues to deteriorate.

2.3 Alternatives Considered but Eliminated From Further Discussion

Alternatives 2b and 2c. Three different interchange types had originally been studied for Indianola Cutoff. They were Alternative 2a-Compact Diamond Interchange, Alternative 2b-Single Point Interchange, and Alternative 2c-Interchange with roundabout intersection with Indianola Cutoff. Alternatives 2b and 2c were initially proposed prior to completing a preliminary traffic impact analysis. These unconventional interchange types were suggested because of the assumed potential for high volumes of "U-turn" movements from Route 101 northbound to southbound and southbound to northbound. Upon completion of the traffic impact analyses, it was determined that a conventional compact diamond interchange would operate with an LOS of B or better. Because Alternatives 2b and 2c would be more costly, would have a larger impact on wetlands, require realignment of the existing drainage ditch at Indianola Cutoff, require the acquisition of additional right-of-way, the non-standard interchange configuration would contribute to driver confusion, and have no operational advantages over Alternative 2a, Alternatives 2b and 2c were dropped from further consideration.

Alternative 4. Alternative 4 has the same features as Alternative 2, except that the median opening at the Airport Road intersection would remain open and non-signalized. This alternative was considered to try to address the 101 Corridor Access Project Group (see section 2.1 in this chapter for more information about this group) and residents along Jacobs Avenue concerns regarding access). Because leaving the Airport Road median crossing open would continue to allow for left movements across Route 101 mainline and left merge movements, it would not meet the project safety, operational, or LOS criteria. Therefore, it was dropped from further consideration**.**

Safety Corridor Alternatives

Alternative 5. Alternative 5, also referred to as the "Safety Corridor as a long term solution" includes maintaining the engineering elements of the present Safety Corridor and adding continual yearly funding for additional enforcement and education efforts. This alternative includes most of the construction elements of Alternative 1 except that the existing Route 101 median openings would not be closed and the addition of extending acceleration and deceleration lanes for left-turn movements at median openings (as no median openings would be closed).

Continual funding of additional enforcement would require an ongoing financial commitment by HCOAG, Caltrans Office of Traffic Safety Program, the state Office of Traffic Safety, or the California Transportation Commission with funding

approvals by the State Legislature in many instances. There is no avenue to provide long-term continuous financial assurances for additional enforcement and education.

Furthermore, traffic volume on Route 101 between Eureka and Arcata is predicted to increase by approximately 30% by Year 2031; consequently, Alternative 5 will not meet the project Need and Purpose for the following reasons:

It does not meet the safety criterion. Left-turn movements across Route 101 medians could result in a higher percentage of fatal plus injury collisions than the State average.

It does not meet operational criterion. The slower posted speed limit and left-turn movements across Route 101 result in operational conflicts. In addition, the reduced posted speed limit on Route 101 causes traffic increases on Route 255 and Old Arcata Road. As traffic volumes increase in future years, the risk for collision increases not only on Route 101 but also on Route 255 and Old Arcata Road.

It does not meet the Level-of-Service criterion. The LOS on Route 101 would degrade at intersections causing greater delays and therefore greater driver frustration.

As previously described, the double fine zone legislation has expired, there is no extra enforcement, and there are no public educational efforts currently for the Safety Corridor. Even if all of components of the initial Safety Corridor were restored, additional roadway improvements are necessary to meet the project Need and Purpose in order to improve safety over the long-term. A review of safety corridors on other highways within the State has shown that their effectiveness is short lived. Among the explanations for this loss of effectiveness given by traffic safety engineers is the phenomenon of habituation. That is why warning signs, which rely upon driver alertness and attentiveness, are not in the long-term meaningful substitutes for permanent engineered structural improvements using the latest design standards. For the reasons listed above, and because traffic volumes and average speeds within the corridor are expected to increase, a long-term constructed improvement solution is needed. If a long-term project were not implemented, median closure would likely still be necessary as safety issues arise. Any remaining elements of the Safety Corridor would be removed after construction of the Route 101 corridor improvements discussed in this document.

This alternative would only meet the roadway rehabilitation conformance criterion and therefore does not meet Need and Purpose, and was dropped from further consideration.

As described above, Alternative 5 is slightly different than Alternative 7, the No-Build Alternative. The full Safety Corridor project included features that have since been removed: enhanced enforcement, education/public awareness campaigns, and double-fines for speeding. Under the No-Build Alternative scenario, the remaining

Safety Corridor elements would remain until conditions warranted partial or entire removal.

Alternative 6. Alternative 6 consists of the same elements as Alternatives 3 and 5. This alternative includes realignment and construction of a signal at Airport Road/Route 101 and constructing a third northbound lane from Cole Avenue to Mid-City Motor World. This alternative would not close or signalize any of the Route 101 median openings (except Airport Road); consequently, it does not meet three of the four project Need and Purpose conformance criteria:

- Alternative 6 would not meet safety criterion. Left-turn movements across Route 101 medians would still cause a higher percentage of fatal plus injury collisions than the State average.

- Alternative 6 also does not meet traffic operational criterion. The slower posted speed limit and left-turn movements across Route 101 result in operational conflicts. In addition, the reduced posted speed limit on Route 101 causes traffic increases on Route 255 and Old Arcata Road.

- It does not meet the traffic Level-of-Service (LOS) criterion. The LOS on Route 101 would degrade at intersections causing greater delays and driver frustration.

This alternative would only meet the rehabilitation conformance criterion and does not meet safety criterion for Need and Purpose and, therefore, was dropped from further consideration.

Signalization (PSR Alternative Y2)

An alternative, with various scenarios, that would use traffic signals at intersections in the Route 101 corridor rather than closing the median crossings was analyzed and dropped from consideration.

Three scenarios of signalized intersections were analyzed:

Scenario 1 – A signal at Indianola Cutoff
Scenario 2 – A signal at Indianola Cutoff and Airport Road
Scenario 3 – A signal at Indianola Cutoff, Airport Road, and Bracut

Each scenario would involve closing all remaining non-signalized median crossings of Route 101, upgrading the existing acceleration and deceleration lanes for right-turn movements, and maintaining a LOS of C (stable operating conditions).

Alternative Y2, which includes signalizing Indianola Cutoff, was eliminated because it did not meet the Safety Conformance Criteria. A signal at Indianola Cutoff, without widening and increasing the number of lanes at the intersection to accommodate turning movements and volumes, would operate at LOS F. In order to meet the Operational Conformance Criteria of LOS C or better, Route 101 requires nine lanes at the intersection. Traffic modeling of this configuration reveals an increase in undesirable weaving movements and vehicle conflicts that ultimately increase collision rates. Alternative Y2 has been removed from further study.

Additionally, the nine-lane intersection of Route 101 and Indianola Cutoff needed to meet LOS C would not be ideal for bicycle or pedestrian crossing needs. To adequately address pedestrian needs, a pedestrian bridge (meeting Americans with Disabilities Act standards) could be required. The quantity of wetland impacts from a nine lane signalized intersection at Indianola is close to that of the compact diamond undercrossing and likely even greater with inclusion of a pedestrian bridge.

Also worth noting is that the Indianola Cutoff intersection has connectivity to Old Arcata Road and is not an isolated intersection such as Airport Road. Changes in traffic patterns could occur that may necessitate construction of an interchange or closure of this intersection in the future. Because of safety issues noted above and the risk that a signal at this location could likely have limited longevity, Caltrans has eliminated this alternative from further study.

Other Alternatives

The alternatives that were discussed during the initial project development and value analysis stages, which were eliminated due to non-conformance with the Alternatives Selection Criteria and/or the additional selection criteria, are listed in Table 2-2.

Table 2-2
Eureka - Arcata Route 101 Corridor
Alternatives No Longer Considered

Alternative		Major Reasons for Dropping From Consideration		
		Meets Selection Criteria?	Meets Additional Selection Criteria? (See footnotes)	Concern
PSR-X1	Close all median crossings, widen shoulders, interchange at Indianola, Eureka Slough bridge at 6th St., east frontage road 6th St. to Bayside Cutoff, and west frontage road from Simpson sawmill to Bracut	Yes	No, c and e	Wetland impacts
PSR-X2	Close all median crossings, widen shoulders, interchange at Indianola, Eureka Slough bridge at 6th St., east frontage road 6th St. to Bracut, and west frontage road from Simpson sawmill to Bracut	Yes	No, c and e	Wetland impacts
PSR-X3	Close all median crossings, widen shoulders, interchange at Indianola, Overcrossing Structure at Cole Ave., reduce median width, and construct east frontage road 6th St. to Bracut, and west frontage road from Simpson sawmill to Bracut (no Eureka Slough bridge)	Yes	No, c and e	Wetland impacts
PSR-X4	Close all median crossings, widen shoulders, Eureka Slough bridge at 6th St., interchange at Indianola, Simpson sawmill Overcrossing Structure, east frontage road 6th St. to Bracut, purchase Bracut Industrial Park for borrow site/wetland mitigation, and eliminate need for access	Yes	No, c and e	Wetland impacts
PSR-X5	Close all median crossings, widen shoulders, elevated structure from Mid-City Motor World to Bracut, Eureka Slough bridge at 6th St., Interchange at Indianola, east frontage road 6th St. to Mid-City Motor World, frontage road under elevated highway from Mid-City to Bracut	Yes	No, c and e	Wetland impacts

PSR-Y1	Close all median crossings, widen shoulders, Interchange at Indianola, Eureka Slough bridge at 6th St., extend acceleration and deceleration lanes at existing access locations	Yes	No, c and e	Wetland impacts
PSR-Y2	Close all median crossings, signal at Indianola with U-turns allowed, Eureka Slough bridge at 6th St., extend acceleration and deceleration lanes at existing access locations, no frontage roads	No	Not applicable	Did not meet Need and Purpose
PSR-Y3	Close all median crossings, widen shoulders, extend acceleration and deceleration lanes at existing access locations, no interchange at Indianola	Yes	Yes	Changed to Alt. 1 with shoulder widening removed
PSR-Y4	Close all median crossings, widen shoulders, diamond interchange at Indianola, extend acceleration and deceleration lanes at existing access locations	Yes	Yes	Changed to Alt. 2 with shoulder widening removed
VA-2.1	Construct Eureka to Arcata frontage road with a 6th St., bridge over Eureka Slough	Yes	No, c and e	Wetland impacts
VA-2.2	Construct Eureka to Indianola Cutoff frontage road with a 6th St., bridge over Eureka Slough	Yes	No, c and e	Wetland impacts
VA-3.0	Implement Transportation System Management Measures and Expand Mass Transit to Maintain Existing Average Daily Traffic	No	Not Applicable	Did not meet Need and Purpose
VA-4.0	Use Pace Cars to Create Traffic Gaps	No	Not Applicable	Did not meet Need and Purpose
VA-6.1	PSR Alternative Y4 with a Flyover Interchange and roundabout on Indianola Cutoff	Yes	No, c and e	Wetland shading and visual impacts
VA-7.0	PSR Alternative Y4 with a Southbound Jacobs Avenue Hook Ramp	Yes	No, c and e	Wetland and Salt marsh impacts

"c" indicates cost was in excess of PSR Alternative Y4
"e" indicates environmental impacts in excess of PSR Alternative Y4.

TSM and Public Transit Alternative (Value Analysis Alternative 3.0)

While VA Alternative 3.0 is described in Table 2-2, it is also worth describing in more detail as questions regarding implementing transit measures to address safety and operational improvements for Route 101 are routinely asked. Transportation System Management (TSM) measures are designed to reduce peak hour highway travel demand or improve the existing highway efficiency without constructing costly improvements or building new highway facilities. The Value Analysis Team (see Chapter 1 for more information about the Value Analysis process) discussed and studied a TSM idea (RTC-6). Idea RTC-6 includes the following TSM measures:

- Raise public traffic safety awareness on the Route 101 corridor; this has already been implemented with television announcements and traffic safety education at schools.

- Implement a toll road, expand public transit, and create incentives for car pooling;

- Provide incentives to encourage flexible work hours/schedules and telecommuting; and,

- Implement turning restrictions such as gates, signs, and times.

The Value Analysis team also looked at combining the above TSM measures with increasing traffic enforcement and substantially increasing traffic fines. These measures have already been implemented with the Safety Corridor discussed earlier in this chapter.

The VA team studied the idea of expanding the existing public bus fleets and facilities, park-and-ride facilities over a period of 20-25 years, and intensifying the marketing of public transit over a five-year period in order for mass transit to be able to handle the projected 20,000 increase in average daily traffic (ADT) over the next thirty years.

This alternative would have positive effects of saving energy, improving air quality, reducing traffic volumes, and maintaining current aesthetics, biological, archaeological, and visual conditions. In addition, this alternative would allow for more efficient use of the existing Route 101 roadway since it could potentially maintain or increase the number of travelers on Route 101 without a major expansion of the roadway. However, this alternative requires increases in State funding, voluntary public participation as users of mass transit, and would have potential biological and environmental impacts where parking lots/structures are constructed and mass transit facilities are expanded. In addition, dispersed moderately low-density housing and employment patterns of Eureka and Arcata limit the ability to feasibly serve travel demand with buses. Expansion of public transit alone would

cost approximately $90,000,000 more that the proposed Build 2 Alternative with an interchange at Indianola Cutoff. The VA team did not study the idea of developing light rail public transit service using the existing railroad facility between Eureka-Arcata, since such an option would likely be more costly than expanding the public bus system. On the basis of extremely high costs, Caltrans eliminated the public transit expansion feature of the TSM alternative from further study.

The TSM alternative would have the advantage of saving fuel, minimizing environmental impacts, and if implemented without expanding public transit, would be relatively inexpensive to implement. However, the predicted increase in future traffic within the Route 101 corridor is expected to nullify safety improvement benefits. Ultimately the TSM Alternative would not fulfill the Need and Purpose for the project to effectively minimize traffic collisions and improve traffic operations at intersections along the Route 101 corridor.

Furthermore, transit alternatives have proven to be more viable choices for motorists when LOS as well as parking becomes a problem. The LOS for mainline Route 101 traffic will not degrade below a LOS D in 2031 (LOS C for southbound), and it would be expected that most commuters would still choose the private automobile over a bus or rail option.

U Turn Alternative. During project scoping an alternative was generated by proponents of expansion of the existing Mill Yard site. This alternative suggested that median openings could be closed and openings created in other locations to allow for U turn movements. While this alternative would eliminate the opportunity for left turn cross movements, it would still allow for left merges and create an increase in weaving movements. For instance, a southbound motorist wishing to exit at Indianola would need to make a turn movement south of Indianola, accelerate to speed, merge into the fast lane, and then change lanes to get to the existing right turn deceleration lane at Indianola to make their exit. This would be expected to result in an increase in collisions along the mainline and have an adverse impact on LOS.

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

Introduction

This chapter explains the effects that the proposed project alternatives would have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the proposed project. Except where discussed, the No-Build Alternative, Alternative 7, would avoid environmental impacts or costs. However, even though the No-Build Alternative does not include any proposed roadway changes, traffic volumes and speeds are expected to increase in the foreseeable future, which will likely necessitate closing one or more Route 101 median openings within the corridor. Closing one or more medians could potentially restrict access to businesses and residents; add out-of-direction travel and delay; increase fuel consumption; and, adversely affect the Level-of-Service of local streets as well as State Route 255. While generally avoiding any immediate impacts, the No-Build Alternative does not satisfy the project Need and Purpose.

Various environmental topic areas are examined in the sections that follow. For each topic, this Environmental Impact Report/Statement (EIR/S) describes the environmental setting, the potential for the proposed project to affect the resources, and recommended measures to minimize harm or mitigation measures that could reduce or avoid potential adverse effects.

Study Area Definition

The Route 101 project limits extend from Eureka Slough Bridge (kilometer post 128.6 or post mile 79.9) at the southern end to the 11th Street overcrossing in Arcata (kilometer post 138.9 or post mile 86.3) to the north. For the purpose of the transportation needs and environmental studies completed for the Eureka to Arcata Route 101 Corridor Improvement Project, the southern limit is the Route101/255 intersection in Eureka (KM 127.5 or PM 79.2) and the northern study limit is the 11th Street overcrossing of Route 101 in Arcata (KM 138.9 or PM 86.3). Some issues, such as potential growth inducement, are evaluated within a wider (Eureka-Arcata or Humboldt County) regional context.

The extent of the environmental setting area evaluated (the Study Area) differs among resources depending on the locations where impacts would be expected. For

example, traffic impacts due to the proposed project are assessed for the regional roadway network, whereas, potential project effects on agriculture are determined by the Route 101 right-of-way and actual construction limits only. The setting sections describe both local and regional resources which occur throughout the broader geographical area.

Basis of Environmental Analysis

The environmental setting sections describe baseline, existing environmental conditions, which provide a baseline for comparing the environmental consequences with the other Alternatives. The analysis of environmental effects in this EIR/S is based primarily upon one of two factors:

1. Environmental consequences related to geologic, hydrological, cultural, agricultural, visual, coastal, and biological resources are analyzed primarily on the basis of the location and area of ground disturbance and development that are projected to result from project construction.

2. Environmental consequences related to traffic, socio-economic conditions, air quality, noise, and energy on the other hand are analyzed primarily on the basis of the traffic volumes projected for the year 2031.

Environmental Analysis Baseline Condition and Timeframe

For each resource area or environmental analysis topic, the conditions that would result are compared to the existing baseline condition. In addition, project alternatives are discussed at the year 2031 planning horizon compared to the existing scenario. The year 2031 is approximately twenty years from the end of project construction.

Cumulative Impacts

In addition to the effects of the proposed project alternatives, the sections that follow also discuss cumulative impacts as applicable. Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative impacts assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively, substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation.

These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (CEQA) Guidelines, Section 15130, describe when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under the National Environmental Policy Act of 1969 as amended (NEPA), can be found in 40 Code of Federal Regulations, Section 1508.7 of the Council of Environmental Quality Regulations.

This chapter summarizes the following technical studies on file at the Caltrans District 1 office in Eureka:

Community Impact Assessment
Floodplain Study
Natural Environment Study
Draft Conceptual Wetland Mitigation Plan
Hazardous Waste Studies
Noise Study
Energy Study
Air Quality Study
Water Quality Study
Traffic Alternatives Evaluation Report
Historic Resources Evaluation Report
Archaeological Survey Report
Historic Property Survey Report
Visual Impact Assessment
Right-of-Way Data Sheet (includes summary of utility involvement)
Traffic Management Plan

Please call Mitchell Higa at 707-441-5855 to review these studies, except for the Archaeological Survey Report and Historic Property Survey Report, which contain confidential information. Please call Timothy Keefe at 707-441-2022 for questions regarding those reports.

3.1 Human Environment

Sections 3.1.1 through 3.1.5 are summarized from a Community Impact Assessment finalized in October 2006. This study is available for public review at the Caltrans

District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

3.1.1 Land Use, Community, Businesses

REGULATORY SETTING

The National Environmental Policy Act of 1969 as amended (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)]. The Federal Highway Administration in its implementation of NEPA [23 U.S.C. 109(h)] directs that final decisions regarding projects 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 the California Environmental Quality Act, 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. 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.

AFFECTED ENVIRONMENT

Route 101 is the most important interregional route serving the northern California coastal area. It accommodates interstate traffic and connects North Coast communities with the San Francisco Bay Area to the south and the state of Oregon to the north. Route 101 is used heavily for intercity traffic between Humboldt County's two largest cities, Eureka and Arcata, and the surrounding communities. It also provides local access to a variety of large and small businesses located adjacent to the Route 101 corridor, as well as to recreational opportunities along Humboldt Bay (including Arcata Bay). The Route 101 Eureka-Arcata corridor is a relatively flat and straight section of coastal highway, with Arcata Bay to the west and primarily agriculture and open space to the east. See Figure S-1 in the summary and Plan Sheets in Appendix A.

Various activities associated with Humboldt Bay directly and indirectly contribute to the local and regional economy. The northern portion of Humboldt Bay is often referred to as Arcata Bay, which is adjacent to the Eureka-Arcata Route 101 Corridor. Most commercial shipping and boating relates to forest products and fishing. Commercial fishing is a major industry and local seafood processors are closely tied

to the fishing industry. Oyster cultivation, herring, and crab fishing are the major commercial fishing activities associated with Humboldt Bay.

Humboldt Bay is regionally important for recreational and commercial boating. Portions of Humboldt Bay were recently deepened to allow large ships, including cruise ships, to enter the bay. Humboldt Bay is the only harbor for major shipping between San Francisco, California and Coos Bay, Oregon. Commercial marine transportation includes deep-draft shipping, barge traffic, and commercial fishing boats. There are several commercial ship docks and shipping related facilities located on the bay**.** The boat marina on Woodley Island is the largest all-season facility on Humboldt Bay and has docking facilities for approximately 300 pleasure and commercial fishing boats.

Since the railroad has not been in service for many years, and faces an uncertain future, Routes 101, 255, and 299 are the only major highways that serve as transportation links from Humboldt Bay.

Humboldt County encompasses approximately 931,000 hectares or 2.3 million acres, 80 percent of which is forestlands, protected redwoods, and recreation areas. Population density is 35.4 persons per square mile, compared with an average of 217.2 persons per square mile statewide. (Source: Redwood Region Economic Development Commission, 2000.) The County's population now exceeds 126,500. The County population grew by 6.2 percent between 1990 and 2000, less than half of the statewide 13.6 percent population growth rate during the same period. The County's population is projected to grow to approximately 141,100 by 2020. (Source: U.S. Department of Commerce, Bureau of the Census, 2003 and Dyett & Bhatia, *Building Communities: A Discussion Paper for Community Workshops, Humboldt 2025 General Plan Update,* February 2002.)

Eureka and Arcata are the largest cities in Humboldt County, with Census 2000 populations of 26,128 and 16,651, respectively. These two cities now hold more than one-third of the County's population. An estimated 59 percent of the County's population lives in the cities and unincorporated communities surrounding Humboldt Bay. (Source: U.S. Department of Commerce, Bureau of the Census, 2003.)

The fastest growing communities in the County are McKinleyville, Fortuna, and Arcata. These communities grew by 26 percent, 19.4 percent and 9.6 percent, respectively, between 1990 and 2000. During the same period, the City of Eureka's population grew by only 3.4 percent, although substantial population growth occurred in the surrounding unincorporated communities of Cutten and Bayside, which had growth rates of 93.6 percent and 79.0 percent, respectively, between 1990 and 2000. (Source: Dyett & Bhatia, *Building Communities: A Discussion Paper for Community Workshops, Humboldt 2025 General Plan Update,* February 2002.)

Employment and Income

Humboldt County has been making the transition from a resource extraction-based economy to a more diversified economy with stronger services and tourism. Over the past twenty years, the County sustained substantial job losses in the timber and commercial fishing industries because of changing environmental regulations and a variety of other factors. Timber production, which has been an important part of Humboldt County's economy in the past, remains strong, although it is not as dominant as it has been in the past. (Nonetheless, Humboldt County still ranks first in the State of California in timber production).

The County experienced an expansion in economic activity from 1985 to 1990, then a slowdown in the early 1990s, reflecting the national recession, as well as changes in the regional economy. Total employment grew by 12.7 percent over this decade. The strongest employment growth occurred in the Finance, Insurance, and Real Estate sector, followed by Services, Agriculture, and Construction and Mining. Employment in Transportation and Utilities declined substantially (by 20.8 percent) during this period. Declines were also experienced in the Wholesale Trade and Manufacturing sectors. The sectors with the highest number of jobs in 2000 were Government, Services, and Retail Trade.

Humboldt County's labor force has been growing at a faster rate than the County population. This reflects a number of demographic trends such as the lowering of the birth rate, the relative aging of the population, and increased labor force participation rates among adults.

Humboldt County's unemployment rate was 7.7 percent in 1990, 6.8 percent in 2000, and 6.1 percent in 2005. These rates were considerably higher than the statewide unemployment rates at those times, which were 5.8, 4.9, and 5.4 percent, respectively in those years. (Source: United States Department of Agriculture, Economic Research Service, 2006.)

Major employers in the City of Eureka include the City and County governments, College of the Redwoods, the School District, and Simpson Timber Company. Major employers in the City of Arcata include Humboldt State University and Mad River Community Hospital.

Average annual pay data from the California Employment Development Department indicate that the annual average pay in most industries in Humboldt County is considerably below the statewide averages for the same industries. The average annual pay for all industries except government was $23,409 in Humboldt County in 2000, compared with $41,182 in the State of California. The only industry sector that paid more than the statewide average was Agriculture, Forestry, and Fishing, which paid $24,753, compared with the statewide average annual pay of $18,778 in this sector. (Source: Dyett & Bhatia, *Building Communities: A Discussion Paper for Community Workshops, Humboldt 2025 Genera Plan Update.* February 2002.) In

2003, the average wage per job in Humboldt County was $27,275. (Source: http://www.city-data.com/County/Humboldt_County-CA.html)

The median household income in Humboldt County in February 2007 was $39,000. The median home sale cost for February 2007 was $309,500, which would require a minimum qualifying income of $75,600. (Source: http://ha**realtors**.com.)

Businesses in the Project Vicinity

Because of Humboldt Bay, the railroad and the adjacent wetlands lie west of the Route 101 corridor. There are only a few businesses located on the west side of Route 101 and south of the Route 101/255 interchange in Arcata. However, one business on the west side (Simpson) is the largest employer located along the corridor, with approximately 110 employees. (Source: Simpson response to business survey, February 2003.) In addition to the Simpson mill operation, there is a cluster of smaller businesses located at the Bracut Industrial Park, including The Mill Yard, Arcata Millworks, Bracut Lumber Company, and Pacific Truss.

The majority of the businesses on the east side of the Route 101 corridor and south of the Route 101/255 interchange in Arcata are clustered along Jacobs Avenue, which can be accessed from Route 101 Cole Avenue (right-turn in and out only) and at Airport Road. The Cole Avenue median opening was closed permanently in 2004 which eliminated left-turn movements at this intersection. There are about two dozen businesses located along the approximately three-quarter-mile length of Jacobs Avenue to Airport Road. These include the following:

- Pacific Hoe, Saw & Knife Co.
- Redwood Reliance Trailer Sales
- Bobcat West
- Eureka Oxygen Co.
- Redwood Kenworth Co.
- John's Used Cars & Wreckers
- County of Humboldt Heavy Equipment Repair/Motor Pool Repair
- United Rentals
- U-Haul Rentals
- Happy Dog
- Applied Industrial Technologies
- Gas Stoves with Style
- Trinity Diesel Inc.
- Rogers Machinery Co.
- Superior Alarms Inc.
- Rainbow Mini Storage
- Rick Harper Automotive
- WB Co.

- R & S Supply
- Lazy J Trailer Ranch (mobile home park)
- Carl Johnson Co.
- Johnson Ranches Farm Store
- Animal Emergency Center

Two more businesses are located at the Humboldt County Airport (Murray Field)—including Northern Air/Cessna Pilot Center and a small café located in the terminal building.

At Mid-City Motor World (KP 131/PM 81.34), there are several foreign and domestic car dealerships selling Toyota, Mazda, Honda, Jeep, Kia, and Ford automobiles. Automobile servicing is also provided at this location.

At Indianola Cutoff, there are several large commercial properties, including a former drive-in theater and a former movie theater. There are also a number of office and retail businesses — including PPD Partners, United Grocers Cash & Carry, J's RV Center and the Mid-County Center. Indianola Cutoff also provides access to other businesses located less than a mile east of Route 101, along Indianola Cutoff, Indianola Road, Old Arcata Road, and Myrtle Avenue. These include the Humboldt Area Foundation Community Center, a body repair shop, mobile home park, and mini storage facility.

KOA Drive provides access to a KOA Campground, which has 158 RV and tent sites, 10 cabins and 2 cottages, as well as a convenience store for campground customers. Other businesses accessible from KOA Drive include Resale Lumber Products, New & Used Country Store Collectibles, Customers Coachways, and a Caltrans Maintenance Station.

Business Survey Results

Caltrans Mail Survey

In January 2003, Caltrans and Mara Feeney & Associates prepared and distributed a survey to the businesses located in the project area, mainly along the Route 101 corridor, but also on nearby roads such as Indianola Cutoff and Old Arcata Road. A total of 58 businesses were identified through field investigations and research. A survey package was mailed to each of the 58 businesses, including a brief questionnaire, and a description of the project alternatives under consideration.

Twenty of the 58 businesses surveyed returned completed survey forms, for a response rate of 34.5 percent. Nineteen of the twenty businesses that responded are located in the immediate vicinity of the proposed project; one is located on Old Arcata Road.

Survey results indicate that these businesses have had relatively long tenure at their locations along the Route 101 corridor. Only four of the businesses had been in place less than ten years, nine of them had been there for over twenty years and four had been at the same location for over 35 years. The newest business had been there for more than four years, and the oldest had been there for over fifty years. The size of the companies ranged from two employees to 110 employees, with a median of 10.5 employees (part-time employees were counted as 1/2 of fulltime).

The busiest times of day reported for these businesses varied widely. Several reported being "constantly" busy. Others reported a range of busy periods throughout the day, with the most busy times clustering in the 8:00 to 9:00 AM and 4:00 to 5:00 PM time periods on weekdays.

Less variation was reported for the busiest season. Only one business reported winter as their busiest season. For the majority of businesses, summer was reported to be the busiest season, although for some firms that busy season began in spring and/or stretched into fall.

In response to the question about hours of operation, the majority of business respondents said their hours were 8 AM to 5 PM, although several opened somewhat earlier or later. Two businesses reported that they operate 24 hours per day; and one reported that it operates 24 hours on weekend days only.

When asked why they had chosen to locate their businesses in their current location, the most frequent answers given were related to the location between the cities of Eureka and Arcata and adjacent to the Route 101 corridor:

- Central location between Eureka and Arcata – 4
- Convenient location – 3
- Easy access to Route 101 – 3
- Good location with highway frontage – 2

Other reasons named included:

- Reasonable cost – 2
- Large lot size – 2
- Natural beauty – 1

In response to being asked what percentage of their customers come from Eureka, Arcata, Samoa/Manila or other areas, the most frequently given response was that approximately half of the customers come from Eureka and half from Arcata. As one respondent noted: " We are midway between Eureka and Arcata and also the midway point of the County." Estimates for percentage of customers from Eureka ranged from zero to 75 percent, with about three-fourths of all responses in the 40 to 60 percent range. Estimates for percentage of customers from Arcata ranged from 0 to 70 percent, with about one third of responses in the 10 to 35 percent range and one-

third in the 40 to 60 percent range. Estimates for percentage of customers from Samoa/Manila ranged from 0 to 15 percent, with more than 60 percent of the respondents saying they had no customers from that area. Estimates of the percentage of customers coming from "other" areas ranged from 0 to 100 percent, with half of all respondents said they had no customers outside the area while and one-third said that 10 to 25 percent of their customers came from outside the area. Only two businesses reported having over half of their customers coming from "other" areas. Businesses with a substantial percentage of customers from the other areas typically referred to other communities in Humboldt County, such as McKinleyville, Fortuna and outlying areas. One business owner noted that customers come from as far south as Ukiah and as far north as Oregon because "we handle items no others have."

May 2003 Open House

Caltrans held a project Open House in Eureka on May 15, 2003, which was attended by many area residents, as well as representatives of some of the business and property owners in the Route 101 corridor. Some of the business owners expressed concern about the potential closure of median openings along Route 101 and the effect this could have on their business, income, and property values. Others expressed the view that the project was essential for safety. Owners of businesses that provide one-of-a-kind merchandise, have few competitors in the area, and/or have a loyal customer base expressed the view that their businesses would not be affected by any of the project alternatives. Others business owners stated that increased travel times and out-of-direction travel would drive many of their customers to competitors and possibly substantially damage their business.

CAP Business Survey

Shortly after the May 2003 Open House, a group composed primarily of owners of businesses on Route 101 between Eureka and Arcata formed an organization, the Corridor Access Project (CAP), to express their business concerns regarding the project. CAP hired a consultant to gather information on business activity in the corridor and business owners' perceptions of the effects that closing median crossings would have on their businesses. In addition, the CAP consultant conducted an Options/Alternatives survey, which was sent to 29 business owners.

CAP's findings are that the 29 businesses surveyed in the Route 101 corridor employ a total of more than 480 employees and an annual payroll of almost $15 million. Gross annual sales were estimated at $131.7 million. Total sales tax generated was estimated at almost $6 million, with approximately $765,000 of this sales tax generated for the City of Eureka. Assessed value of property and improvements for the 29 businesses was estimated at $29.3 million and annual property taxes at $316,000.

The CAP group met numerous times after June 2003, indicating a high degree of concern about the proposed project among some of the potentially affected business owners. In addition, the CAP group presented their survey findings and position statement to representatives of HCAOG, the City of Eureka, City of Arcata, Humboldt County, and Caltrans to ensure that their information, concerns and perceptions would be considered in the project decision-making process. The group felt that the Safety Corridor program had been effective in addressing safety concerns, although some felt that the acceleration/deceleration lanes along the corridor should be improved and that traffic signalization should be added at Airport Road and at Mid-City Motor World. They supported construction of an interchange at Indianola, but opposed any median closures, at least until the impacts of access restrictions to businesses could be mitigated through construction of frontage roads to reduce out of direction travel and improve safety. Subsequently, the CAP group has expressed support for a project that would include signalization at Airport Road and an interchange at Indianola, with continuation of reduced speeds, at least in the vicinity of the new signal. (Source: Shreve, Tim, Manager, Carl Johnson Company, 2006. Personal communication with Mara Feeney, August 29, 2006)

LAND USE

Existing Land Use Patterns

Generalized land use in the project vicinity is shown in Figure 3-1. The project extends from the City of Eureka to the City of Arcata through rural lands that include wildlife refuges, farmed wetlands, grazing pastures, and some relatively small pockets of commercial and industrial use. Much of the agricultural land around Humboldt Bay is comprised of former tidelands that were diked and reclaimed around the turn of the 20th century. North of the Route 101/255 interchange in Arcata, the land use changes to an urban mixed-use setting.

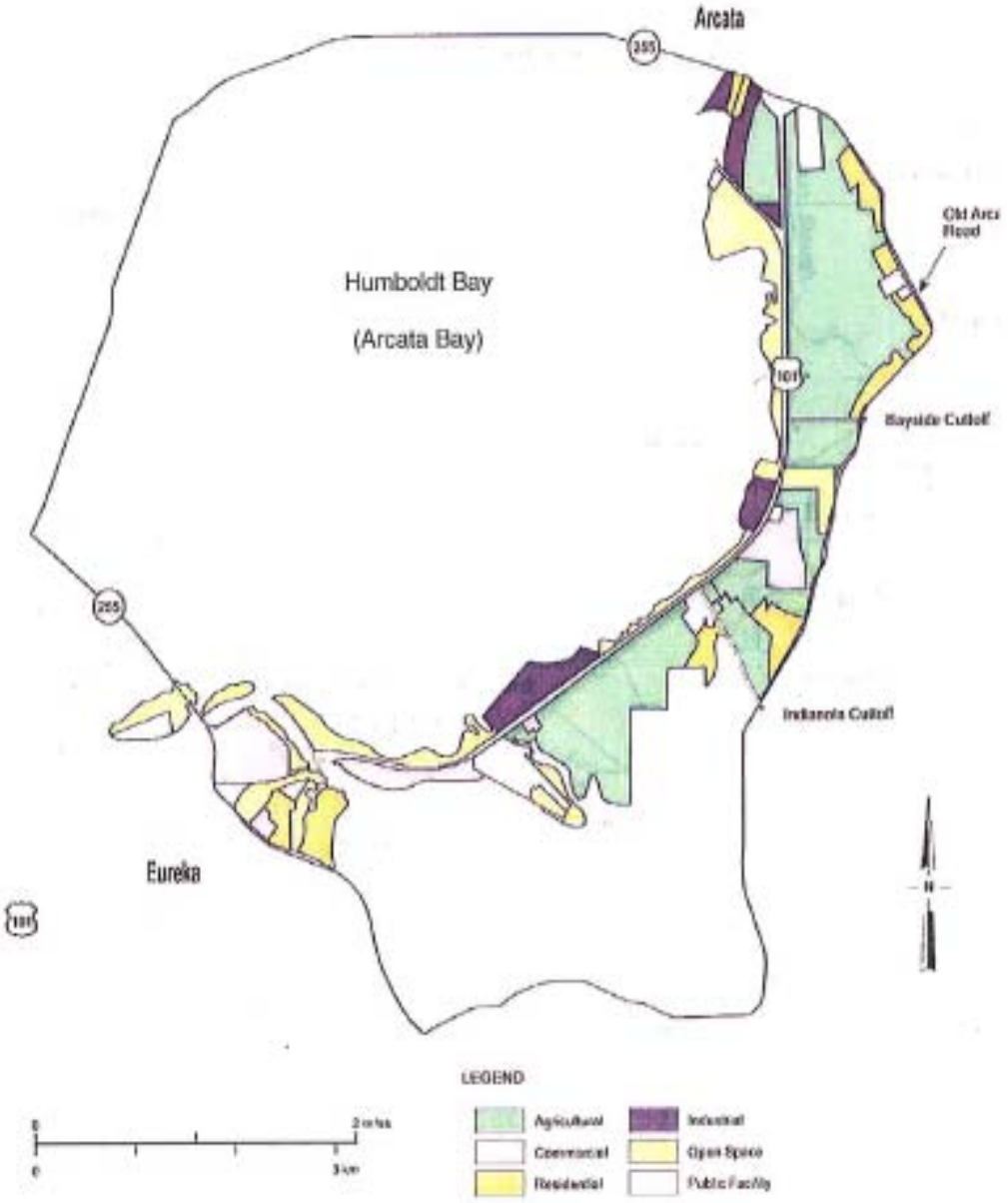


Figure 3-1

Land uses along Route 101 between Eureka and Arcata

Humboldt Bay (includes Arcata Bay) lies to the west of the Route 101 corridor and adjacent to wetlands, wildlife refuges and sanctuaries, and a (currently unused) railroad line that parallels Route 101. There are two industrial properties located on the west side of the expressway—Simpson Mill and the Bracut Industrial Park. Current recreation access points to Humboldt Bay and Arcata Bay in the project vicinity include a boat landing on Eureka Slough, as well as boat landings and hiking trails at both the Arcata Marsh and Wildlife Sanctuary and the Mad River Slough Wildlife Area.

On the east side of Route 101 is a mix of agricultural/open space uses, with limited sites for commercial/industrial uses, most of which are concentrated along Jacobs Avenue and Indianola Cutoff in the City of Eureka (as described in section 2.2.2). A California Department of Fish and Game Wildlife Refuge surrounds Murray Field and Mid-City Motor World. KOA Drive at Bracut provides Route 101 access not only to the campground, but also to a Caltrans Maintenance Station and several commercial properties.

Public Recreation

Humboldt Bay (includes Arcata Bay) lies to the west of the Route 101 corridor and adjacent to wetlands, wildlife refuges and sanctuaries, and a (currently unused) railroad line that parallels Route 101. Current recreation activities such as hunting are allowed in the Humboldt Bay National Wildlife Refuge on the west side of Route 101 and in the State wildlife area on the east side of Route 101. Hiking opportunities and wildlife observation are popular at the Arcata Marsh and Wildlife Sanctuary at the north end of the corridor.

Existing development

There are two industrial properties located on the west side of the expressway—Simpson Mill and the Bracut Industrial Park. On the east side of Route 101 is a mix of agricultural/open space uses, with limited sites for commercial/industrial uses, most of which are concentrated along Jacobs Avenue and Indianola Cutoff in the City of Eureka (as described in section 2.2.2). A California Department of Fish and Game Wildlife Refuge surrounds Murray Field Airport and the Mid-City Motor World car dealership on the east side of Route 101. KOA Drive at Bracut provides Route 101 access not only to the campground, but also to a Caltrans Maintenance Station and several commercial properties.

There is very limited residential development along the Route 101 corridor--including a few scattered ranch homes, the Lazy J Trailer Ranch and the KOA campground, which has some permanent residents. Indianola Cutoff and Bayside Cutoff provide access to the unincorporated communities and rural residential areas located approximately 1.6 kilometer (one mile) east of the corridor.

Land Use Designations

Land along the project corridor lies within three jurisdictions: the City of Eureka, the City of Arcata, and Humboldt County. The City of Eureka extends northeast along Route 101 to the vicinity of Indianola Cutoff. The City of Arcata extends south to approximately 1,000 feet south of Bayside Cutoff. The area between the two cities lies in unincorporated Humboldt County.

Land within the City of Eureka on the west side of Route 101 is designated "Natural Resources" from Eureka Slough to the Simpson Mill property, which is designated General Industrial. On the east side of Route 101, the land along Jacobs Road is designated General Services Commercial. Murray Field is designated Public/Quasi-Public, and there is a small area adjacent to the Airport designated Natural Resources, beyond which is Agricultural land.

The Agricultural land use designation extends from Murray Field to Indianola Cutoff, with the exception of Mid-City Motor World and a relatively small area on the south side of Indianola Cutoff (both designated General Service Commercial) and a parcel of land at the intersection of Indianola Road and Walker Point Road designated Estate Residential.

Humboldt County land use designations along the corridor include Natural Resource in the wetland areas, Manufacturing at Bracut Industrial Park, and Agriculture Exclusive along the east side of the corridor. Land along the corridor that is located within Arcata city limits is designated primarily as Agriculture Exclusive for the preservation of agricultural uses, or Natural Resource for the protection of public and private lands with unique or sensitive resources. North of the Route 101/255 interchange in Arcata, the land use is mixed use in an urban setting.

Development Trends

Population growth in Humboldt County has occurred at a rate considerably slower than the State of California's growth rate over the past two decades. Projections indicate continued relatively slow growth over the next twenty to thirty years. Because the City of Eureka is almost completely built out, population is not expected to grow within the city limits. The majority of recent development in the Eureka area has occurred outside the city limits, and the population of this surrounding unincorporated area now is nearly equal to that of the city proper.

Further development is expected to occur, however, in the unincorporated neighborhoods surrounding Eureka. Principal growth areas will continue to be the Cities of Fortuna and Arcata, as well as the unincorporated communities of McKinleyville and Garberville, where adequate services exist to accommodate the anticipated population growth. (Sources: Humboldt County General Plan Volume I -

Framework Plan and Redwood Regional Economic Development Commission, 2000.)

The land uses along the Route 101 corridor have remained relatively stable over the past decade. Further development along the Route 101 corridor is restricted by local land use policies and zoning constraints, as well as by insufficient infrastructure and services. Governing jurisdictions have policies and zoning controls in place to protect the natural resource areas, open space, and agricultural uses along the corridor. It appears unlikely that local policy changes or demand for commercial or industrial development will result in changes in the intensity or types of uses found along the Route 101 corridor in the foreseeable future.

Adopted Local Plans and Policies

This section describes pertinent plans and policies that have been adopted by Humboldt County, Eureka, and Arcata, and to guide land use and development decisions. In addition, pertinent policies contained in HCAOG's Regional Transportation Plan are reviewed below.

Land in the study area also lies within the Coastal Zone, where the California Coastal Commission regulates land use. Development activities within this zone require both local permits (from the City or County) and a State Coastal Development Permit, to ensure the project complies with the policies of the California Coastal Act. This Act requires each jurisdiction within the Coastal Zone to develop a Local Coastal Program (LCP) consistent with the Act and to guide development. Eureka, Arcata, and Humboldt County have incorporated the required LCP elements into their General Plans, which guides land use within the project limits.

Humboldt County

Humboldt County's General Plan was last revised in 1984; however, the County launched a comprehensive General Plan update process in 2000. Since then, the County has been engaged in gathering data, examining the changes that have occurred over the past two decades, and developing projections to the year 2025, in order to plan for future population changes and associated community development needs in the unincorporated areas of Humboldt County.

Existing policies in the 1984 General Plan (Volume 1 Framework Plan) are aimed at delineating urban and rural areas, so that growth can be directed to the urban areas where services are available and away from agricultural areas, open space, and timberlands. The Plan states that development adjacent to agricultural land should be compatible with agriculture.

The 1984 General Plan also contains policies aimed at accommodating growth in the County in an orderly manner, through identification of spheres of influence and urban

expansion areas where sufficient public services exist. The Plan encourages development of land not suitable for resource development before urban development is permitted on resource lands. The Plan states:

> "Factors such as public water and sewer availability, road and street capacity, police and fire protection, proximity to educational and health facilities and solid waste management should be assessed in urban development proposals."

Agricultural land uses are protected through General Plan policies such as the following:

> "Extension of services such as sewer, water and roads should avoid traversing agricultural lands. Where infrastructure must cross agricultural lands, they should be located in public right-of-way and provide a Level-of-Service consistent with the development density reflected in the Land Use Plan."

The General Plan states a County goal "to develop, operate and maintain a well-coordinated, balanced, circulation system that is safe, efficient and provides good access to all cities, communities, neighborhoods, recreational facilities and adjoining regions" (Goal 4220). One of the specific policies under this goal states that "significant increases in traffic volumes and turning movements on and off a major expressway/freeway at high volume at grade intersections should be discouraged" (Policy 4231.3). The Plan supports development of an integrated transportation system based on land use and one that accommodates bicycles and transit, as well as automobiles (Policy 4237.4).

A working paper developed in 2002 as part of the County's General Plan update process, "Building Communities," includes a number of draft policy statements concerning the importance of transitional or buffer areas between urban and rural land uses. It underscores the need to balance open space and preservation of agricultural land with economic development and job creation in the coming decades. (Source: Dyett & Bhatia, *Building Communities: A Discussion Paper for Community Workshops, Humboldt 2025 General Plan Update.* February 2002.)

City of Eureka

The City of Eureka General Plan Policy Document (adopted in February 2002) contains adopted goals, policies, and objectives. The City aims to promote commercial and residential development that "takes advantage of existing facilities and services, while discouraging sprawling strip commercial development." (Source: General Land Use and Development Policies and Programs, Section 1: Land Use and Community Design.)

The City's General Plan identifies Broadway (Route 101 within the southern half of the city) as Eureka's longest-standing, and most difficult traffic problem. The Plan

proposes several alternatives to address this problem, from realigning Route 101 and providing better signage to constructing a bypass. (Source: General Land Use and Development Policies and Programs, Section 3: Transportation and Circulation.)

The City's General Plan contains a number of land use and community design policies aimed at preventing urban sprawl:

- "The City shall discourage new development within the city that will adversely affect the economic vitality of the Core Area. The City shall also encourage Humboldt County to discourage such development in adjacent unincorporated areas" (Policy 1.L1).

- "The City shall discourage isolated and sprawling commercial activities along major roads and instead reinforce the vitality of the Core Area and existing community and neighborhood shopping areas" (Policy 1.L.3).

A similar prohibition is contained in City Ordinance 156.055, Public Works Standards, which states that "There shall be no extension of urban services (sewer and water) beyond the urban limit line as designated in the Local Coastal Program, except that the water system connecting line in the southwestern part of the City shall be permitted to extend outside the urban limit line, provided no connections for private users shall be allowed outside the urban limit line." (Source: City of Eureka General Plan, 2001.)

Eureka's General Plan also includes policies that pertain to integrating facilities for bicycle users. Policy 3.C.7 states that, wherever possible, bikeways should be located on exclusive paths that are physically separated from automobiles, maximizing the use of streets with low vehicular traffic levels.

City of Arcata

The City of Arcata's General Plan 2020 states that "Arcata's environmentally conscious development guidelines, and surrounding permanent greenbelt, promote compact growth and resist the pressures for unplanned sprawl." The General Plan expresses a commitment to open space and agricultural land preservation, and alternative transportation and energy use. It promotes the use of the least polluting, most efficient transportation means and encourages multi-modal transportation. (Source: http://www.arcatacityhall.org/2020/c1vision.html)

Land Use Policy LU-6e states that lands designated Agriculture Exclusive (A-E) and Natural Resource (NR) are important components of Arcata's open space plan, as defined in the Open Space Element. Policy LU-6e promotes the conservation and management of these lands for their natural resource values, as well as their biological, hydrological and soil resources. The Plan states that conversion of these lands to other non-compatible uses shall be prohibited. (Source:

http://www.arcatacityhall.org/2020/c2_community_dev/c2elem2d1_landuse/c2landuse2d1.html .)

Arcata's General Plan expresses support for travel demand management and a balanced transportation system with a choice of travel modes. Specific transportation policies include the following:

- **T-1c Intercity travel.** The City shall coordinate with Humboldt County and Caltrans to provide adequate facilities for vehicles, buses, and bicycles to serve intercity demand. Joint efforts may include transportation improvements outside of Arcata, which serve intercity travel, such as bicycle links, timed-transfer bus stops, park-and-ride lots, and regional transit service and development of park-and-ride lots in Arcata to reduce intercity vehicular travel.

- **T-1d Critical transportation facilities.** Critical transportation facilities for emergency vehicle access and emergency evacuation shall be maintained and improved as a priority need. Critical transportation facilities include the major routes into and out of the City such as Routes 101, 299, and 255, their interchanges with City streets and primary intra-city street connections.

- **T-4a Freeways and Highways.** Routes 101 and 299 are designated as freeways for their entire length in the City. State Route 255 is designated as both an arterial and a highway within the City. The following standards shall apply to these classifications:

    1. Function. The function of freeways is to provide for high-speed automobile and freight movement for intercity and regional travel.

    2. Interchange improvements. The City supports interchange improvements that reduce potential conflicts created by unrestricted access from freeway off-ramps.

Humboldt County Association of Governments

HCAOG is the Regional Transportation Planning Agency for Humboldt County and a sponsor of the proposed project. HCAOG's main policy document is the 2004 Regional Transportation Plan (RTP), which was prepared in cooperation with Caltrans and local transportation agencies and transit authorities, as well as with considerable public involvement. The RTP identifies strategies aimed at promoting efficient connections between the regional transportation network and future planned land uses. Policies contained in the RTP include:

- Provide travel mode choice so that people have the choice to travel independently on the mode that fits their needs. These choices not only

involve the automobile, but also alternative modes such as transit, walking, biking, and telecommuting.

- Support regional multi-modal travel on major routes that connect major activity destinations. The transportation system should provide access from local areas to regional activities in centers such as Eureka, Arcata, Fortuna, and McKinleyville.

- The RTP promotes multi-modal travel, with pedestrian and bicycle accessibility to transit and other destinations. (Source: http://www.hcaog.net/needasmt.htm)

Based on public input, the RTP identifies the following projects as having general long-term priority:

- Eureka-Arcata corridor - Pedestrian and bicycle improvements

- Eureka-Arcata corridor - Route 101 (for automobiles)

- Inner-city/downtown Eureka - Route 101 and cross-traffic. (Source: The Humboldt County Association of Governments, Final Draft, 2000-02 Regional Transportation Plan. http://www.hcaog.net/actelem.htm.)

Policy 1.03 in the RTP is to "support safety improvements on highways, roadways, and streets in the HCAOG region." Another policy (1.06) is to promote at-grade intersection improvements, including those on State Routes where Caltrans would be the lead agency responsible for making the improvements. The RTP encourages the development of alternative modes of travel (including transit and bicycling) to provide choice and reduce automobile congestion. (Source: http://www.hcaog.net/polelem.htm)

ENVIRONMENTAL CONSEQUENCES

Economic Consequences

Employment and Local Purchasing during Construction

The construction of Route 101 corridor improvements proposed under Alternatives 1, 2, and 3 would generate local income and tax revenues through construction payroll spending and local purchasing of construction materials such as fill, concrete, aggregate and asphalt. Alternative 7 (No-Build Alternative) would have no immediate impact on local employment, income, or local purchasing of construction materials. Over time, however, it is possible that increased traffic congestion and collisions on Route 101 could lengthen commute times and discourage customers from patronizing businesses located along the corridor.

Potential Impact on Local Business Patronage

The closing of median openings (as proposed under Alternatives 1, 2, and 3) would reduce operational conflicts and improve circulation along the Route 101 corridor, but it would make access to existing businesses and homes along the corridor less convenient, possibly discouraging some customers from patronizing the businesses, with resultant potential net losses in business income and jobs. (See section 3.1.6 in this chapter for a discussion of out-of-direction travel and associated travel delay.) The section below addresses the potential income and employment impacts of the median closings on local businesses (access to homes along the corridor is addressed in Section 3.1.4 in this chapter). Businesses south and north of the project limits would not likely be affected by the access restrictions (closed Route 101 medians).

Economic Effects of Restricting Access to Businesses

The profitability of any particular business is influenced by many factors. These include the robustness of the regional and national economy, the number and location of competitors (including the internet), the location of major population and employment centers, proximity to other businesses that draw customers, and changes in zoning or local policies that can affect community land use patterns.

Many studies have been conducted on the impacts of roadway modifications that can result in changes in access to local businesses. (Refer to Chapter 9 for a list of studies and research reports.) Even though the majority of these studies focus on construction of bypasses and freeway ramp closures, the studies were reviewed to obtain information about the type and magnitude of economic impacts associated with these relatively extreme forms of access restriction to local businesses, as an indication of the nature of impacts that might occur as a result of a less extreme form of access restriction, such as closing the median openings and restricting left-turn movements, as is proposed under Alternatives 1 through 3.

Many of the studies reviewed caution against extrapolating findings from one case study to another project, since the situation of any particular business and the characteristics of other roadway improvement projects are unique. While study findings ranged widely, some generalizations can be made from them. For example, the literature suggests that businesses that cater primarily to through traffic may suffer financially more than those serving local needs, once a bypass diverts traffic away from these businesses. Other general findings include the following (Source: Caltrans Environmental Handbook, Volume 4):

- The size of the community can influence the intensity of impacts from bypasses on roadside businesses (generally the larger the population base, the less the impact);

- The effects of a bypass on towns with tourist-based or service-oriented economies may be less than on other towns;

- A bypass that diverts traffic approximately 1.6 km (or one mile) or less away from existing businesses will cause less of a drop in sales volume than one built more than a mile away (travelers seem willing to drive 1.6 km or mile out of the way even for convenience items such as gas and food); and

- Some highway-oriented businesses are able to overcome revenue losses through creative means such as expanding advertising to attract more local customers or adjusting products or services to cater more to local needs.

The National Cooperative Highway Research Program published a Research Results Digest specifically on the subject of left-turn restrictions (as opposed to bypasses or ramp closures) on local businesses. (Source: Weisbrod, Glen E. and Roanne Neuwirth. National Cooperative Highway Research Program Research Results Digest Number 231, "Economic Effects of Restricting Left Turns" (NCHRP Project 25-4). August 1998)

This report states:

"Restriction of left-turn access, particularly in heavily traveled commercial areas, has long caused friction between businesses and traffic engineers. Issues of customer access to local establishments often clash with the desire to reduce opportunities for collisions, improve speed and flow for through traffic, and reduce neighborhood traffic…Much of the protest results from the belief by business and property owners that traffic volumes and accessibility can affect the prospect for business sales and profits…Streets and highway systems have always served two functions—the movement of traffic and the service of land. At one end of the spectrum, local streets are planned to service land use almost to the exclusion of traffic movement. At the other end, freeways are designed to move traffic while providing virtually no service to abutting land. Intermediate roadway types usually serve both functions and the varying demands of each can create competition and conflict."

Based on a review of case studies, collection of business sales and other economic data before and after left-turn restrictions were implemented, as well as customer surveys, the report noted that, while some highway bypass studies indicate a relationship between loss of access and changes in business sales, this is not necessarily the case when access to businesses is altered but the businesses remain visible from the roadway. Several studies indicated that changes in access which result in longer travel times could affect shopping mall and grocery store sales, due to changes in travel patterns and the relative availability of competing businesses.

The report goes on to say that changes in access can affect some types of local businesses, particularly those that have substantial local competition, but that it does not affect others, making it difficult to generalize findings.

> "Overall, findings on the effects of left-turn restrictions on businesses have been mixed and widely varied. For cases where businesses were surveyed, some experienced losses, some experienced gains, and some had no change…there is also evidence that effects depend on the extent to which businesses rely on 'pass-by' traffic versus those that are 'destination-oriented."

The types of businesses that depend the most on pass-by traffic include restaurants (especially "fast food"), cocktail lounges, motels, gas stations, and convenience stores. Businesses that are typically not traffic dependent include industrial facilities, appliance repair, new auto sales, and veterinary businesses. Other types of businesses, such as hardware and grocery stores can be variable in the amount they depend upon passing traffic. (Sources: Weisbrod, Glen E. and Roanne Neuwirth. National Cooperative Highway Research Program Research Results Digest, Number 231. "Economic Effects of Restricting Left Turns." August 1998, and the Caltrans Environmental Handbook - Volume 4.)

In an analysis of sales volumes for businesses affected by left-turn restrictions versus a comparison group, (adverse) changes in sales were found to be statistically significant for gasoline stations and nondurable retail stores. Other types of businesses did not show any significant change in sales, except for grocery stores, which showed a statistically significant increase in sales following the implementation of left turn restrictions in this particular study. (Source: Weisbrod, Glen E. and Roanne Neuwirth. National Cooperative Highway Research Program Research Results Digest Number 231, "Economic Effects of Restricting Left Turns" (NCHRP Project 25-4). August 1998.) Since it is not clear how access restrictions could increase sales volume, it is likely that other factors were responsible for this study finding, demonstrating that many factors are involved in business revenues, not just convenience of access.

Interviews were conducted with 113 business owners affected by left-turn restrictions. Of these, 46 percent believed that the left-turn restrictions had a negative effect on their business, 33 percent believed there was no effect, and 14 percent said they experienced a positive effect after the restrictions were implemented. Some business owners reported that sales declined immediately after the restrictions were imposed, but that they increased again later. Several businesses stated they increased advertising in order to overcome difficulties that might result from access changes and remain competitive.

> "Comments from business owners indicate that businesses that are primary destinations for customers (e.g. car dealerships, furniture stores, department stores, supermarkets, and building or electrical supply stores) may be less

> affected than businesses depending on pass-by traffic (e.g. gas stations, fast food restaurants and ice cream or donut shops). This may be because of the unique merchandise or service or the customer's loyalty to the establishment." (Source: Weisbrod, Glen E. and Roanne Neuwirth. National Cooperative Highway Research Program Research Results Digest Number 231, "Economic Effects of Restricting Left Turns" (NCHRP Project 25-4). August 1998.)

Based on case study data collected for the left-hand turn effects report, the authors estimated the percentages of dependence on "convenience" or "impulse" trips by different types of businesses, as follows:

- Gas stations 95%
- Convenience stores 95%
- General Merchandise 65%
- Restaurants 50%
- Durable Goods 40%
- Supermarkets 40%
- Services 30%
- Specialty Stores 20%

The author of this study noted that these default values should be adjusted if the business has a loyal customer base or if prices are substantially different from those of competitors, which would reduce adverse impacts. The literature concludes that ease of access is only one of many factors that influence business location choices and that may influence the ongoing success of any particular business. Other factors, such as the type of business, the specialty of the merchandise or service offered, the prevalence of local competitors, customer sensitivity to price and quality, customer loyalty and the state of the local and regional economy also influence business profitability.

Classification of Local Businesses by Type

For the purpose of assessing effects to businesses, an effort was made to classify each of the businesses along the Route 101 corridor between Eureka and Arcata as belonging to one of the following groups. Note that none of the project alternatives would substantially affect the access of businesses south of the Eureka Slough Bridge and businesses north of the Bayside Cutoff and are not listed or classified.

Type I: Businesses Highly Dependent on Pass-by Traffic (includes those that cater to the traveling public or depend on spontaneous purchases, e.g. gas station, convenience store, motel, cocktail lounge, fast food restaurant, donut or ice cream shop).

Type II: Businesses with Variable or Uncertain Dependence on Pass-by Traffic (includes those with relatively good availability of similar goods and services from competing sources, e.g. shopping malls, supermarkets or hardware stores).

Type III: Businesses Least Dependent on Pass-by Traffic (includes specialty goods/services providers and destination-oriented businesses, e.g. electrical supplies, appliance repair, furniture stores, new auto sales, department stores, veterinary services and industrial facilities).

Based on field observations, Caltrans mail survey results, and information obtained at the May 15, 2003 Open House, the businesses along the Route 101 corridor were classified as follows:

- Simpson mill - III
- Bracut Industrial Park businesses:
    - − mobile home storage – III
    - − millworks – III
    - − lumber company - II
- Pacific Hoe, Saw & Knife Co. - III
- Redwood Reliance Trailer Sales - III
- Hyster Sales Co./Bobcat West - III
- Eureka Oxygen Co. - III
- Redwood Kenworth Co. - III
- John's Used Cars & Wreckers - III
- Resco United Rentals - III
- U-Haul Rentals - III
- Happy Dog - I (day care)/II (boarding)
- Applied Industrial Technologies - III
- Gas Stoves with Style - III
- Trinity Diesel Inc. (parts and service) - III
- Rogers Machinery Co. - III
- Superior Alarms Inc. - III
- Rainbow Mini Storage - III
- Rick Harper/Mid-City Motor World (car sales and service) - III
- WB Co. (electric service) - III
- R & S Supply (roofing and building supplies) - II
- Carl Johnson Co. - II
- Johnson Ranches Farm Store - III
- Animal Emergency Center - III
- Murray Field - III
- Mid-City Motor World/Harper Ford - III
- United Grocers Cash & Carry - II
- J's RV Center (RV sales) - III
- Eureka KOA - I
- Resale Lumber Products (recycled lumber, firewood, building supplies) - III

- Country Store Collectibles (new and used collector items) - III
- Customer Coachways - III

As shown above, only two of the businesses along the Route 101 corridor appear to be Type I businesses--the KOA campground, which caters to the traveling public, and Happy Dog, which provides pet care and boarding services. Approximately one third of Happy Dog's business is day boarding or dog "day care," and a majority of day care customers commute between Eureka and Arcata (i.e. live in one city but work in the other). These customers drop their pets off on the way to work and pick them up on the way home, making the convenience of access off Route 101 critical to them.

Four other corridor businesses were identified as Type II businesses and include two building supply retailers, a ranch supply store, and a grocery store. Some studies suggest that certain types of similar retail businesses (including lumber and hardware sales) could be subject to a potential decline in sales, especially if they have competitors in the vicinity that are easier to access by customers and that offer the same or better quality and prices.

The majority of the businesses currently located along the corridor were identified as Type III businesses, because they provide some type of specialty merchandise or services, or are primary shopping destinations. These are the types of businesses that, theoretically (according to the studies reviewed), should be least likely to be affected substantially by changes in access. As documented through the survey, many of them have been in business a long time and have nurtured customer loyalty. The majority of their customers are local, meaning that they very likely travel both north and south along the Route 101 corridor between Eureka and Arcata on a regular basis. Under Alternatives 1 and 2, customers of these businesses would no longer be able to do their errands or shopping readily on *either* their northbound *or* their southbound trip. Instead, they may choose to organize their errands to coincide with northbound or southbound journeys, patronizing a particular business (depending on its location) on one leg of their journey or the other. This would be less convenient than it is at present, but not impractical while the inconvenience is balanced by the benefit of having a safer travel corridor with fewer collisions involving fatalities and injuries at intersections.

The degree to which current customers would behave this way, however, is likely to vary depending upon the business. Some business owners expressed confidence that their customers would continue to come, and that roadway changes would not affect their sales: others stated that the easy access onto and off of Route 101 is critical to their business. In addition to owners of Type I and II businesses, the following businesses submitted written comments:

- Animal Emergency Center (customers with animals needing emergency care need quick access to facility);

- Rainbow Mini-Storage (customers need frequent access to their stored goods);

- Redwood Kenworth (it would be too difficult for customers driving tractor-trailers southbound to make U-turns in Eureka; the owner estimates that net profit could drop as much as 30 percent due to increased cost of doing business, longer times needed for purchasing trips to Eureka, and more demand for deliveries to customers who now pick up merchandise themselves).

Other Economic Issues

The three Build Alternatives would require both temporary and permanent easement. The easement acquisition will not affect any businesses or impair the operations of Murray Field Airport or potential future operation of the railroad. See Section 2.2 – Project Alternatives in Chapter 2 for more information regarding easement requirements.

During construction, access to businesses will be maintained. See section 3.1.6 in this chapter for more information.

LAND USE

Compatibility with Existing Land Uses

For Alternatives 1, 2, and 3, all proposed roadway improvements would mostly occur within the existing Route 101 highway right-of-way. Easement acquired for any of the project alternatives would not impair any existing use: therefore, these alternatives would not result in any changes to existing land uses or displacements of any existing homes or businesses. (See Chapter 2 for Alternatives descriptions and the Plan Sheets 7 through 16 in Appendix A for right-of-way and easement acquisition locations. These alternatives would not divide or disrupt the physical arrangement of any existing community or agricultural operation, nor would they require any changes to existing land use designations or zoning in the project vicinity. Alternative 7 (No Build) would involve no new construction and would not affect existing land uses in the project vicinity. Therefore, all project alternatives would be compatible with existing land uses in the study area.

Public Recreation

None of the Alternatives would directly or indirectly impact recreational activities either during construction or after construction.

Consistency with Adopted Plans and Policies

None of the project alternatives would require any amendments to adopted General Plans or other adopted local planning goals and policies. No inconsistencies with local adopted goals and policies of the Cities of Arcata and Eureka or Humboldt County were identified. Alternative 7 (No Build) may be inconsistent with Humboldt County's advisory Public Services and Facilities Policy 4231.3, which states that "significant increases in traffic volumes and turning movements on and off a major expressway/freeway at high volume at-grade intersections should be discouraged." It may also be inconsistent with HCAOG's roadway Policy 1.03 to "support safety improvements on highways, roadways and streets in the HCAOG region." This alternative would result in substantial increases in traffic volumes and turning movements on and off of Route 101 at high volume at-grade intersections. Therefore, safety conditions are expected to deteriorate over time as traffic volumes increase along the Route 101 corridor.

Division of Established Communities

None of the project alternatives would displace any homes or businesses from the study area, so they would not divide or disrupt an existing community. Alternatives 1 and 2, however, would restrict access and force out-of-direction travel resulting in delay and increased fuel consumption: this in turn could cause economic hardship for households residing at Lazy J Trailer Ranch and the Eureka KOA, potentially causing them to relocate. Alternative 3, which includes signalization at Airport Road, would improve access for the Lazy J Trailer Ranch residents but not help KOA residents.

Residents of Manila complained to Caltrans that the Safety Corridor program (reduced posted speed limit on Route 101) resulted in an increase in traffic levels through their community on Route 255. Traffic counts confirm that there was an increase in traffic on Route 255 after the Safety Corridor program was implemented, but traffic on that section of Route 255 remains below historic levels and would remain below historic levels under any of the project alternatives. No disproportionately high and adverse impacts to the community of Manila were identified under any of the project alternatives.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Although the proposed closing of medians under Alternatives 1, 2, and 3 could contribute to lower sales (and associated income and job losses) for some of the affected businesses, there is no reliable basis that can be used to quantify or predict this relationship. Unfortunately, there is no standard or accepted methodology for estimating losses of business patronage due to turn restrictions. (Even the nationwide study that surveyed 250 agencies and analyzed data from over 9,200 businesses failed

to develop a predictive model that might be used to estimate the economic effects on other businesses faced with left-turn access restrictions.) Because there are so many factors influencing business activity, it is not possible to isolate one factor—ease of access—and predict how changing that single factor would affect a business's bottom line. Attempting to quantify potential revenue losses for each business would be speculative. However, it is likely that Type I businesses would be affected the most and Type III businesses the least. Sales tax revenues associated with these businesses could also be reduced, but such revenue losses to the City or County would not expected to be substantial.

It is clear that impacts to local businesses would be less under Alternatives 2 and 3--which provide an interchange at Indianola--than under Alternative 1, which causes the most out of direction travel and increased travel times to access Route 101 corridor locations. For Alternative 3, businesses accessed via Airport would not be affected, because this median crossing would remain open, but left-turn access to Mid-City Motor World, Simpson mill, and KOA Drive/Bracut Industrial Park businesses from southbound Route 101 would be eliminated. For Alternative 7 (No-Build Alternative), cross-median access would remain at all locations, but traffic congestion and collisions would increase over time, which could indirectly affect local business patronage.

While direct taking of commercial property for transportation purposes is compensable under the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, changes in travel patterns or provision of alternative access to homes or businesses are not compensable under Federal law. Since none of the proposed project alternatives would cause the actual physical taking of property, no property or business owners would be eligible for acquisition and relocation benefits. Long lead time and reliable information, as well as participation in planning decisions, will be critical in allowing local business owners to make important decisions regarding the future of their businesses.

3.1.2 Growth

REGULATORY SETTING

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act 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 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…"

The analysis and findings of this section were based on "Guidance for Preparers of Growth-related, Indirect Impact Analyses" to meet both National Environmental Policy Act and California Environmental Quality Act requirements. A working group composed of Caltrans, Federal Highway Administration and U.S. Environmental Protection Agency representatives prepared this guidance.

AFFECTED ENVIRONMENT

See previous section, 3.1.1 – Land use, Community, Businesses section for affected environment information.

ENVIRONMENTAL CONSEQUENCES

Questions that are typically asked to identify a project's potential to induce unplanned or undesired growth in a particular area are the following:

1. Will the project attract more residential development or new population into the community or planning area?

2. Will the project encourage the development of more acreage of employment generating land uses in the area (such as commercial, industrial or office)?

3. Will the project lead to the increase of roadway, intersection, sewer, water supply, or drainage capacity?

4. Will the project encourage the rezoning or reclassification of lands in the community general plan from agriculture, open space or low density residential to a more intensive land use?

5. Does the project conflict with the growth related policies, goals or objectives of the local general plan or the area growth management plan? Or is it in conflict with the implementation measures contained in the area's growth management plan?

6. Will the project lead to the intensification of development densities or accelerate the schedule for development or will it facilitate actions by private interests to redevelop properties within 3.2-kilometers (two

miles) of an existing or future major arterial roadway or within 6.4 km (four miles) of a limited access highway interchange?

7. Will the project measurably and significantly decrease home to work commuter travel times to and from or within the project area (more than 10 percent overall reduction or five minutes or more in commute time savings)?

For Alternatives 1 and 7, the answers to all of the above questions would be "No," meaning that these alternatives are not expected to be growth inducing. For Alternative 2 (and to a lesser extent, Alternative 3), the answers to the above questions would be "No," with the exception of Question 6. Because Alternatives 2 and 3 include constructing a new interchange, the answer to Question 6 is "not likely." The following paragraphs discuss the likelihood of growth inducement; increasing the growth rate; and changing the amount, pattern, and location of growth resulting from the proposed project.

As discussed in Section 3.1.1 Land Use, Community, Businesses in this Chapter, the Humboldt County population and economy are growing but at a much slower rate than other population areas in California. In addition, the shortage of affordable housing remains a continuing problem for the region. Both these factors suggest the demand for substantial growth is generally lacking.

A new highway or adding through lanes to an existing highway can stimulate or direct growth by accommodating larger numbers of vehicles accessing developing areas. Highway projects can also reduce congestion, which would enhance remote locations for housing construction. The purpose of this proposed project is to enhance safety, improve Level-of-Service at intersections, and rehabilitate the existing roadway. None of the project alternatives would increase highway carrying capacity either locally or regionally. Access to developing or potential development areas already exists at all locations, including Route 101 at Indianola Cutoff. A new interchange at Indianola Cutoff would enhance the existing access but the Route 101/Indianola Cutoff area is not a situation in which an interchange would resolve a major traffic congestion bottleneck in an urban area or open new areas to development. Refer to Section 3.1.6 Traffic, Transportation/Pedestrian, and Bicycle Facilities in this Chapter for more information.

Lands in the vicinity of the Indianola Cutoff are within the jurisdiction of the City of Eureka on the south side and Humboldt County on the north side, with the exception of a relatively small flag lot, which is within Eureka's City limits. The land within the County is designated and zoned for Agricultural use in an approximately 366-meter (1,200-foot) wide band along Route 101 and Rural Residential use to the east of the agricultural band. (Refer to Section 3.1.3 Farmlands/Agricultural Lands in this Chapter.)

Land within the City of Eureka limits is zoned for commercial use in the area adjacent to Route 101 and along Indianola Cutoff and Indianola Road, with a small area designated for Estate Residential use. The City land, however, is a narrow band that extends only about one half a kilometer or one third of a mile east from Route 101, encompassing Indianola Cutoff to Indianola Road and Indianola Road east to Walker Point Road. This area of limited commercial and residential use, isolated at the north end of the City limits, is separated from the rest of Eureka's urban area by an over 1.6-kilometers (one-mile) of sensitive wetland and preserved open space. This sensitive area is well protected by adopted local plans and policies, as well as zoning. (Refer to Section 3.1.1 Land Use, Community, Businesses in this Chapter.)

A pipeline supplies water to the area south of Indianola Cutoff within the City limits; however, there is no sewer service to the area, and the land is not suitable for septic systems. The City of Eureka is unlikely to extend sewer service to the area because of environmental impacts and costs associated with constructing a new pipeline across protected wetlands. The few businesses that are located along Indianola Road were developed at a time when a new sewer line from Arcata to Eureka was being considered. However, that plan was abandoned, so that the few businesses in the vicinity rely on holding tanks and sewer pump-out service. The potential increase in attractiveness of this area for commercial development that could result from construction of the Route 101/Indianola Cutoff interchange (Alternatives 2 and 3) would need to be weighed against the inconvenience of lack of urban sewerage facilities, as well as the limited land available for any further expansion at that location—either on adjacent City land or outside the City limits. It is now stated policy that the City of Eureka will not provide any water hookups to any area outside City limits:

> "The City of Eureka has previously considered the issue of extending urban services (particularly water) into additional areas, and has formalized a commitment that urban services (water and sewerage) not be extended beyond existing serviced areas. Amending this City position would require an ordinance revisions, and the proposal would be subject to a CEQA assessment." (Source: Mad River Water Pipeline Rehabilitation Project Draft EIR. December 17, 2001.)

The City of Eureka has an Enterprise Zone, which has been in place since 1986 and as of May 2007 is conditionally approved. This program targets economically distressed areas and provides tax incentives to stimulate business investments and job creation. Concurrently with its request for a time extension, the City also requested an extension of the geographic area encompassed by the Enterprise Zone program, including extending it to encompass the properties along the Route 101 corridor, as well as those on the south side of Indianola Cutoff. City staff expect that only existing businesses would be able to take advantage of the Enterprise Zone and that it will not affect future development patterns. (Source: Liscom, Marie, Economic Development Coordinator, City of Eureka. E-mail message to William Paul, Mara

Feeney & Associates. November 12, 2003 and King, Sharon, Eureka Redevelopment Agency. Telephone conversation May 3, 2007.)

Because the Eureka-Arcata Route 101 Corridor has high visibility and is the most heavily traveled corridor in the region between the larger population areas, large-scale retailers have been interested in building within the corridor. In addition, the City of Eureka has limited area zoned for commercial development. In 1993, a Sam's Club was proposed in the vicinity of Route 101 and Indianola Cutoff. The project was abandoned because of the infrastructure constraints, permit obstacles (since the area lies within the Coastal Zone and would require a Coastal Development Permit, as well as city permits and a Caltrans permit to enter) and the potential traffic impact mitigation costs. Both Costco and Wal-Mart subsequently looked at locating in the same area and decided against it for similar reasons. The Wal-Mart proposal encountered staunch local opposition from residents and businesses. In addition, the existing area zoned commercial may be insufficient for off-street parking requirements as well as a large-scale retail building with required street set-backs and landscaping. A recent proposal to expand facilities at Bracut Industrial Park was also abandoned, because of the costs of completing the environmental analysis for the project and potential mitigation costs.

Transportation projects in rural areas have traditionally had a lower potential to cause growth-related impacts than suburban areas, because the relatively low rural population density and economic activity generates less demand for conversion of undisturbed lands to developed uses. Since the Wal-Mart proposal, other large-scale development is being considered or has occurred in the existing Bayshore Mall and waterfront area in Eureka and in the City of Fortuna: this suggests economic growth pressures exist, but actual development occurs in non-rural areas.

Constructing a Route 101 interchange at Indianola Cutoff would likely remove one development constraint, however there are other major constraints such as lack of a sewer line, various required government permits, and lack of existing area zoned for a large-scale retail development. It is possible that adjacent land could be re-zoned for commercial use. Re-zoning is a formal process requiring environmental compliance, public participation, and approval from a politically appointed body or elected officials. In addition, the general plans for Eureka, Arcata, and the County of Humboldt emphasize preserving rural character, agriculture land, open space, and wetlands of the Route 101/Indianola Cutoff area. (Refer to Section 3.1.1 - Land Use, Community, Businesses in this Chapter for more information regarding general plans.)

A new interchange may enhance the commercial property value of the Indianola area, which could potentially provide an incentive to more intensive use of the area, but not necessarily provide strong incentive for a large retail establishment. However, any new development near the Indianola Cutoff intersection would require permits and environmental review. Therefore, for the aforementioned reasons, although possible, it is not reasonably foreseeable that any of the project alternatives would likely induce

substantial growth or indirectly create an incentive to develop large-scale development, especially in areas of sensitive biological or cultural resources such as wetlands or archaeological sites. In sum, large-scale growth has been following a pattern and trend of occurring in urbanized areas of Humboldt County and not rural areas such as the Route 101/Indianola Cutoff area.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Since none of the project alternatives are likely to be growth inducing, there are no avoidance, minimization, and/or mitigation measures proposed.

3.1.3 Farmlands / Agricultural Lands

REGULATORY SETTING

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 USC 4201-4209; and its regulations, 7 CFR Part 658) require federal agencies, such as the Federal Highway Administration, 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 land of statewide or local importance.

The California Environmental Quality Act (CEQA) requires the review of projects that would convert Williamson Act contract land 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 taxes to deter the early conversion of agricultural and open space lands to other uses.

AFFECTED ENVIRONMENT

Between Eureka and Arcata, the Route 101 Eureka-Arcata corridor is a relatively flat and straight section of coastal highway, with Humboldt Bay, which includes Arcata Bay, to the west and primarily agriculture and open space to the east. Humboldt County land use designations along the corridor include: “Natural Resource” in the wetland areas, “Manufacturing” at Bracut Industrial Park, and “Agriculture Exclusive” along the east side of the corridor. Land along the corridor that is located within the Arcata city limits is designated primarily as “Agriculture Exclusive” for the preservation of agricultural uses, or “Natural Resource” for the protection of public and private lands with unique or sensitive resources.

The City of Arcata’s General Plan 2020 states that “Arcata’s environmentally conscious development guidelines, and surrounding permanent greenbelt, promote

compact growth and resist the pressures for unplanned sprawl." The General Plan expresses a commitment to open space and agricultural land preservation, alternative transportation and energy use. It promotes the use of the least polluting, most efficient transportation means and encourages multi-modal transportation. Land Use Policy LU-6e states that land designated Agriculture Exclusive and Natural Resource are important components of Arcata's open space plan, as defined in the Open Space Element. Policy LU-6e promotes the conservation and management of these lands for their natural resource values, as well as their biological, hydrological and soil resources. The plan states that conversion of these lands to other non-compatible uses shall be prohibited.

Humboldt County's General Plan was last revised in 1984; however, the County launched a comprehensive General Plan update process in 2000. Since then, the County has been engaged in gathering data, examining the changes that have occurred over the past two decades, and developing projections to the year 2025, in order to plan for future population changes and associated community development needs in the unincorporated areas of Humboldt County. Existing policies in the 1984 General Plan (Volume 1 Framework Plan) are aimed at delineating urban and rural areas, so that growth can be directed to the urban areas where services are available and away from agricultural areas, open space and timberlands. The Plan states that development adjacent to agricultural land should be compatible with agriculture. The 1984 General Plan also contains policies aimed at accommodating growth in the County in an orderly manner, through identification of spheres of influence and urban expansion areas where sufficient public services exist. The Plan encourages development of land not suitable for resource development before urban development is permitted on resource lands. The Plan states:

> "Factors such as public water and sewer availability, road and street capacity, police and fire protection, proximity to educational and health facilities and solid waste management should be assessed in urban development proposals." Agricultural land uses are protected through General Plan policies such as the following:
>
> "Extension of services such as sewer, water and roads should avoid traversing agricultural lands. Where infrastructure must cross agricultural lands, they should be located in public right-of-way and provide a Level-of-Service consistent with the development density reflected in the Land Use Plan."

The General Plan states a County goal "to develop, operate and maintain a well-coordinated, balanced, circulation system that is safe, efficient and provides good access to all cities, communities, neighborhoods, recreational facilities and adjoining regions" (Goal 4220). One of the specific policies under this goal states that "significant increases in traffic volumes and turning movements on and off a major expressway/freeway at high volume at grade intersections should be discouraged" (Policy 4231.3). The Plan supports development of an integrated transportation system based on land use and one that accommodates bicycles and transit, as well as

automobiles (Policy 4237.4). A working paper developed in 2002 as part of the County's General Plan update process, "Building Communities," includes a number of draft policy statements concerning the importance of transitional or buffer areas between urban and rural land uses. It underscores the need to balance open space and preservation of agricultural land with economic development and job creation in the coming decades.

ENVIRONMENTAL CONSEQUENCES

None of the Build Alternatives would result in farmland or rangeland conversion or involve California Land Conservation Act (Williamson Act) contracts. However, off-site wetland mitigation is still being developed and may involve acquiring range-land/farmland. Existing agricultural land surrounding Humboldt Bay is often re-claimed former tideland and wetland mitigation may include acquiring agricultural and restoring tidal hydrology. If farmland is acquired for wetland mitigation, this is-sue will either be addressed in the final Environmental Impact Report/Statement or a supplemental Environmental Impact Report/Statement. Farmland acquisition will be coordinated with the responsible resource agencies. This issue is discussed further in the draft Conceptual Mitigation Plan available at the Caltrans District 1 office.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Mitigation is not required since this project will not directly result in farmland conversion.

3.1.4 Environmental Justice

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 Executive Order 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.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. Caltrans' 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 C of this document.

AFFECTED ENVIRONMENT

Three separate sub areas of the study region have been identified as potential Environmental Justice (EJ) communities on the basis of income: the Lazy J Trailer Ranch (a mobile home park), the Eureka KOA Campground, and the community of Manila located on the Samoa Peninsula.

Lazy J Trailer Ranch and Eureka KOA

The Lazy J Trailer Ranch is located at 3956 Jacobs Avenue, and the Eureka KOA is located at 4050 North Highway 101. While the KOA is primarily used for short-term RV or tent camping stays, there were approximately 22 permanent residents living in RV units at that facility in December 2004. The Lazy J Trailer Ranch was built in 1955 and has 54 rental spaces, 51 of which were occupied in December 2004.

Interviews with the managers of these facilities indicated that only one of the permanent KOA households and four of the Lazy J households are minority; thus, these residential populations are not predominately minority. (Source: Karla Davick, Eureka KOA Manager. Personal communication with Mara Feeney, December 8, 2004.) Identifying resident income levels proved to be challenging. The decennial census generally provides the most accurate household income data, but information is not available for such small geographic areas. An attempt was made to obtain tenant income information from application files at the KOA and Lazy J offices, but such information was not requested of applicants by one of the facilities, and only limited (and some cases dated) information was available at the other. An attempt was made to survey the residents, as reported below, but the survey response rate was low.

FHWA guidance recommends using the Federal Department of Health and Human Services poverty guidelines to determine whether or not a household is low income. The Health and Human Services poverty guidelines for 2007 are as follows:

SIZE OF FAMILY	ANNUAL INCOME
1	$10,210
2	13,690
3	17,170
4	20,650
5	24,130
6	27,610
7	31,090
8	34,570

Source: *Federal Register*, Vol. 72, No. 15, January 24, 2007, pp. 3147–3148

A survey was prepared for residents of Eureka KOA and the Lazy J Trailer Ranch, to determine whether or not the residents' current household incomes exceed these thresholds. Completed survey forms were received from nine of the KOA permanent residents. Of these nine households (five of which were single person households and four of which were two-person households), three reported incomes below the poverty threshold and six were above. Only seven of the 52 Lazy J Trailer Ranch households returned completed survey forms. Of these seven households, only one reported income below the federal poverty threshold.

It became apparent that use of the federal poverty threshold was too restrictive when it was realized that even an elderly, disabled resident living on Supplemental Security Income (SSI) payments alone would exceed the poverty threshold for a one-person household as defined above. SSI is a federal program that provides monthly cash payments to elderly and/or disabled people in need. To qualify, a recipient must have little or no income and few resources (less than $2,000 in assets, excluding home and car, for a single individual, or $3,000 for a couple). California adds a small cash supplement to the federal SSI payment in lieu of other benefit programs, such as food stamps. In December 2004, the monthly SSI payment in California, including the standard state supplement, was $790 for a single person living independently. (Source: http://www.ssa.gov/pubs/111125.html) This would result in an annual income of $9,480--$170 above the poverty threshold defined above.

Further discussions with FHWA staff led to the discovery that other approaches (besides using federal poverty thresholds) have been used and are permitted for EJ analyses in California. (Source: Katie-Ann Wong-Murillo, FHWA Environmental Specialist. Personal communication with Mara Feeney, December 13, 2004.) The most recent Caltrans guidance recommends using a more flexible approach and makes reference to a case study in the San Francisco Bay Area that used twice the federal poverty threshold as the criterion, due to the high cost of living in the Bay Area, relative to the rest of the nation. (In that study, low-income population clusters were identified in areas where 30 percent of residents had incomes below twice the federal poverty thresholds.) Using a factor of 1.5 times the nationwide threshold (to adjust for cost of living in Eureka, which is higher than the nation but lower than the San Francisco Bay Area – Source: According to the National Association of Realtors, a person living in Eureka would need to earn approximately 79 percent of the salary of a person living in Oakland, adjusting for cost of living differences in the two regions (Realtor.com Salary Calculator, January, 2005), four of the seven Lazy J households would be considered low income, and at least four of the nine KOA households would be considered low income.

Additional information provided by the Lazy J Trailer Ranch management indicated that approximately twenty of the resident households had incomes below 1.5 times the poverty threshold for single person households and/or were dependent solely on SSI payments for income. Another four trailers were occupied by students, at least two of whom receive financial aid from the institutions they attend. This information, combined with field reconnaissance and anecdotal information provided by residents

at special outreach meetings described below, indicates that a substantial proportion of the residents living in the Lazy J Trailer Ranch and the Eureka KOA should be considered to be low income, even though these communities also include some higher income individuals. Other factors considered in determining the special sensitivity of these two populations to project impacts include their isolation from services (groceries, gas, medical care, drugstores and other shopping or community services), the lack of public transit service provided to either location, and the lack of comparable low cost replacement housing resources in the region. For these reasons, the Lazy J Trailer Ranch and Eureka KOA are considered Environmental Justice communities for the purpose of this analysis.

Manila

2000 census data indicate that 90 percent of Manila's population is White. Therefore, it is not an EJ community on the basis of race. Reliable income data is extremely difficult to obtain for small areas. Nonetheless, there is 2000 census block data, as well as other indirect, published and anecdotal evidence described below, indicating that Manila residents are predominately low income and therefore should be considered an EJ community.

In comparing block group data for the Manila-Samoa-Fairhaven area (BG 11-1) with the same date from the 2000 census for the Block Group that encompasses the Lazy J Trailer Ranch (8-3), the economic status of Manila residents appears to be worse. For example, the median household income in BG 11-1 was $29,405, compared to $35,402 in BG 8-3. Furthermore, the percent of the population whose income was less than 1.5 times the poverty threshold (a slightly different measure than FEMA poverty guidelines, but very similar) was 32 percent in BG 11-1, compared with 21 percent in BG 8-3. (Furthermore, BG 11-1 encompasses a subdivision outside of Arcata where there are half-million dollar homes, which would distort the data to make Manila residents appear better off than they really are).

In 2005, the after-school and summer children's recreation program at the Manila Community Center had one hundred children enrolled, 51 of whom are homeless (i.e. have no permanent address, currently living in cars or with friends or relatives). In the Peninsula Union School District, which serves much of the Samoa Peninsula population, over 90 percent of students qualify for free or reduced-cost lunches under the USDA National School Lunch Program.

Humboldt County completed a Preliminary Redevelopment Report in January 2005 that covers several areas of the County, one of which is the community of Manila.

The Report documents blight conditions in the community of Manila and reports the following findings:

- Approximately 75 percent of all housing units in Manila are substandard (67 percent are deteriorated and require rehabilitation; 8 percent are dilapidated);
- More than one-third of all parcels are served by unpaved streets or alleys that are in largely poor condition;
- Almost half of the parcels in Manila have improvement-to-land value ratios of less than 1.0, "testifying to the impaired investments and stagnant property values in the Sub-area;" and
- The community lacks basic amenities such as a grocery store, drug store, or bank.

Based on the above information, Manila was considered a predominately low-income community for the purpose of this analysis.

Manila, located on Route 255, is not within the Route 101 corridor. However, since Route 255 is the primary alternate route between Eureka and Arcata, residents from this community have commented that changes to Route 101 can result in increased traffic volumes on Route 255.

ENVIRONMENTAL CONSEQUENCES

None of the project alternatives would displace any members of the identified Environmental Justice populations or divide an established Environmental Justice community, because none would involve any direct takings of residential property. However, Alternatives 1 through 3, especially Alternative 1, would result in increased out-of-direction travel distance resulting in disproportionate economic hardship for some Environmental Justice community residents. Alternative 1 includes closing the Route 101 median at Airport Road, which currently is the only access for the Lazy J Trailer Park residents living on Jacobs Avenue to make left-turns to and from Route 101. If the Airport Road median were closed and left-turns eliminated, a trip originating at the Lazy J Trailer Park to central Eureka would require turning right from Airport Road onto Route 101 and then turning around at the Route 101/255 interchange in Arcata before finally returning to Eureka. Alternative 1 would require traveling an additional 16.1 kilometers or ten miles (compared to the existing conditions) for a round trip from the Lazy J to Eureka. A KOA resident attempting a round trip to Arcata would not be affected by the median closure at Bracut when proceeding to Arcata, however the return trip from Arcata would require either driving to Eureka to turn around or using Old Arcata Road and Indianola Road. Alternative 1 would require traveling an additional 5.1 kilometers or 3.2 miles (compared to the existing conditions) for a round trip from the KOA to Arcata.

Alternative 2 also includes closing the Route 101 median at Airport Road, but includes a new Route 101/Indianola interchange. A new interchange would

substantially reduce out-of-direction travel and delay for low-income residents at the Lazy J Trailer Ranch. Under Alternative 2, a trip originating at the Lazy J Trailer Park to central Eureka would require the driver to turn right from Airport Road onto Route 101 and turn around at the proposed Route 101/Indianola Cutoff interchange (approximately midway between Eureka and Arcata) and return to Eureka. Alternative 2 would require traveling an additional six kilometers or 3.7 miles (compared to the existing conditions) for a round trip from the Lazy J to Eureka. KOA residents would also benefit from a Route 101/Indianola interchange since trips originating from Arcata would travel south on Route 101 and turn around at the proposed interchange, proceed north on Route 101, and turn right at the Route 101/Bracut intersection to access the KOA. Alternative 2 would require traveling an additional 2.3 kilometers or 1.4 miles (compared to the existing conditions) for a round trip from the Lazy J to Eureka. The low-income residents at the Lazy J Trailer Ranch greatly outnumber the KOA residents at Bracut.

Alternative 3 includes realigning and signalizing the Route 101/Airport Road intersection as well as including a new Route 101/Indianola interchange. Under Alternative 2, there would be no out-of-direction travel for Lazy J residents traveling to and from central Eureka. KOA residents would experience the same travel situation as Alternative 2.

Both low income residents and non-low income residents of the Lazy J Trailer Ranch and KOA would be disproportionately impacted by Alternatives 1 and 2, because under these alternatives the trailer park and KOA residents would be required to spend considerably more time and money in out-of-direction travel than other residents of the study region. Alternative 1 would especially impact Lazy J residents since Alternative 2, which includes an interchange midway between Eureka and Arcata, would eliminate the need to travel to turn around in Arcata. Out-of-direction travel would likely impact residents even more than it would affect business owners or patrons (as discussed in Section 3.1.6 - Traffic and Transportation), since many of the residents stated that they made numerous trips from their homes to other destinations in Eureka or Arcata, including to drop children at school, shop for essentials, attend meetings and appointments, or visit family members and friends. As documented in the Community Impact Assessment, trailer park residents expressed intense opposition to Alternatives 1 and 2 at special outreach meetings held for this project because of the extreme effect it would have on their time, budget and quality of life.

Permanent residents of the KOA campground would bear a similar disproportionate burden not only under Alternatives 1 and 2, but also under Alternative 3, under which the median opening at Airport (where Lazy J Trailer Ranch is located) would remain open. However, the median opening at KOA Drive (at Bracut) would be closed, causing KOA residents considerable out-of-direction travel and associated time and expense to access their homes when making round trips from Eureka or Arcata. However, Alternative 3 would affect far fewer low-income residents and the impacts would be less intense than those associated with Alternatives 1 and 2 since the

median at Airport Road would remain open. For more information about out-of-direction travel in terms of access restrictions, see Section 3.1.6 in this chapter.

Because they are predominately low income, those who own vehicles tend to own older and less fuel-efficient vehicles than higher income residents of the study area. Also, because there are very few services (medical clinics and shopping) located within walking distance of these residential areas and because they are poorly served by transit services, the residents are more dependent on travel on the Route 101 corridor to obtain access to basic services. Lazy J Trailer Ranch residents who attended the December 8, 2004 special meeting complained that the recent increases in gas prices had exacerbated economic hardships for them. Some meeting attendees stated that they do not have automobiles and are dependent on biking or taxi service to get to Eureka and Arcata. The added out of direction travel that would result from Alternatives 1 and 2 would make biking infeasible and taxi costs considerably higher for Lazy J Trailer Ranch residents. Those with automobiles stated that their gas costs and inconvenience would increase to the point that they would feel forced to move under either Alternative 1 or 2.

Alternative 2 was perceived as not as restrictive as Alternative 1, but would still not be workable for Lazy J residents. They believed that it would still make driving too expensive and inconvenient. "It hurts people on fixed incomes," one attendee stated. The meeting participants urged Caltrans to consider other alternatives, including signalization at Airport Road, or extension of Jacobs Avenue across the slough into Eureka.

It is clear from the survey data on length of tenure, as well as from comments made by residents, that the people who reside at Lazy J Trailer Ranch want to remain living there, and most have few options, because of their limited income. The Lazy J Trailer Ranch charges approximately $200 per month rent to trailer owners. Other parks in the region charge $360 per month or more.

Furthermore, most of the trailers at Lazy J are too old to be accepted at other mobile home parks in the region. Alternatives 1 and 2 would create another disproportionate economic impact on residents of the Lazy J. For the many residents subsisting on SSI payments, their home is their primary asset. Residents noted that, when they are no longer able to live independently, they plan to sell their home. If the home is located in a trailer park with significant access restrictions (Alternatives 1 and 2), they would be unable to sell, or the home value would be substantially reduced. For permanent residents of Eureka KOA, low-cost living options are also limited.

Even though the No-Build Alternative does not include any proposed roadway changes, traffic volumes and speeds are expected to increase in the foreseeable future, which will likely necessitate closing one or more Route 101 median openings within the corridor. The No Build Alternative (Alternative 7) would not have a disproportionate impact on Environmental Justice communities in the short term. However, in the 20-year planning horizon, the No-Build Alternative does have the

potential for disproportionate, adverse impacts at the Lazy J Trailer Ranch and KOA because collisions could increase at both Airport Road and at Bracut intersections if no improvements are made. This is a potential disproportionate impact since unlike other residents not residing adjacent to Route 101, only the KOA and trailer park residents are entirely dependent on the Airport Road (and Cole Avenue-Jacobs Avenue) and Bracut access points. Closing one or more medians could potentially restrict access to businesses and residents; add out-of-direction travel and delay; increase fuel consumption; and, adversely affect the Level-of-Service of local streets.

Table 3-1 summarizes the project alternative effects on the local Environmental Justice populations. The primary impact would be economic resulting from out-of-direction travel and travel delay. However, the Environmental Justice populations would derive an enhanced safety benefit from any of the Build Alternatives.

Table 3-1
Potential for Disproportionate Adverse Impact on EJ Populations

Community	Alt 1	Alt 2	Alt 3	Alt 7 No -Build
Lazy J Trailer Ranch	Y	Y	N	N*
KOA Campground	Y	Y	Y	N*
Manila	N	N	N	N

* The No Build Alternative (Alternative 7) would not have a disproportionate impact on Environmental Justice communities in the short term. However, in the 20-year planning horizon, the No-Build Alternative does have the potential for disproportionate, adverse impacts at the trailer park and KOA because collisions could increase at both Airport Road and at Bracut intersections if no improvements are made.

No disproportionately high and adverse impacts to the community of Manila were identified under Alternatives 1, 2, or 3 (refer to appropriate sections of EIR/S for discussion of potential air quality, noise, visual and traffic impacts affecting these Environmental Justice populations). Residents of Manila complained to Caltrans that the Safety Corridor program increased traffic levels through their community on Route 255. Traffic counts confirm that there was an increase in traffic on Route 255 after the Safety Corridor program was implemented, but traffic on that section of Route 255 remains below historic levels and would remain below historic levels under any of the project alternatives. (See Section in 3.1.6 – Traffic and Transportation/Pedestrian and Bicycle Facilities in this chapter for more information.)

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Alternative 3, which includes signalization at Airport Road, would avoid closing the Airport Road median opening and consequently avoid impacts to the Lazy J Trailer

Ranch residents, but would not benefit the KOA residents. The proposed Route 101/Indianola Cutoff interchange included in both Alternatives 2 and 3 would mitigate out-of-direction travel and delay for KOA residents, but would not completely avoid the impact.

Neither State nor Federal regulations/laws provide compensation for restricting highway access. Because of the potential for disproportionate adverse effects on the KOA and Lazy J Trailer Ranch residents, Caltrans will periodically inform residents of the project design and planning process and provide opportunities for additional comment.

3.1.5 Utilities / Emergency Services

AFFECTED ENVIRONMENT

There are several utilities crossing Route 101, particularly within the northern project limits within the City of Arcata. An underground SBC telephone line on the west side of Route 101 and a Pacific Gas & Electric gas line equipment on the east side of Route 101 are currently located within the Route 101 Right-of-Way in the Bracut area and may need to be relocated by the proposed project. (See Appendix A Plan Sheets 14, 15, and 16 for location.) All three Build Alternatives include replacing the southbound Jacoby Creek Bridge, which has a telephone line attached to it. There are also gas, electrical, and telephone lines outside of the existing Route 101 Right-of-Way that may require relocation to construct the intersection for Alternative 3. All other utilities are expected to remain.

Utilities that do not meet Caltrans highway design policies for longitudinal encroachment within the Route 101 Right-of-Way include two existing utility lines that are within the Route 101 Right-of-Way near the proposed interchange at Indianola Cutoff under Alternatives 2 and 3 include:

- 274-meters (900-feet) of 20-cm (eight-inch) diameter Pacific Gas & Electric gas main and relocation of eight electrical poles;

- 274-meters (900-feet) of SBC underground telephone line;

These utilities are not accessible immediately from the highway and therefore will not be relocated as a result of this project.

Other providers of utilities and services that are near, or cross the project corridor but would not be affected by the project include overhead electrical and cable television lines; a waterline; and a sewer line.

Emergency service providers

Route 101 is critical for all types of emergency response vehicles. The range of emergency services that operate along the Route 101 corridor is typical of any metropolitan area. Services include police and fire protection, as well as ambulance service.

Emergency service providers in the project area include the California Highway Patrol, Humboldt County Sheriff's Department, the Eureka Police Department, Arcata Police Department, Humboldt Fire District 1, the Eureka Fire Department, the Arcata Fire Protection District, and the North Coast Emergency Medical Services Agency. Many of these agencies have mutual aid agreements to facilitate response to fires, traffic accidents, and other emergencies in the Eureka-Arcata region.

ENVIRONMENTAL CONSEQUENCES

Utilities

All three Build Alternatives may require relocating an underground telephone line west of the southbound lanes at the Bracut Industrial Park. In addition, gas line equipment on the east side of Route 101 near the Caltrans Bracut Maintenance station will be relocated. These utilities would likely be placed parallel to their present alignments just outside of the proposed paved improvements.

A telephone line would be attached to the new Southbound Jacoby Creek Bridge. Gas and possibly telephone lines east of the northbound lanes at Bracut would also require relocation. (See Appendix A Plan Sheets 14, 15, and 16 for location.)

Caltrans has provided these utilities with State cost estimates for the potential utility relocation work. These types of relocations for a roadway construction project are made following standard procedures and would not result in impacts to cultural or biological resources. Utility service disruption would not be anticipated during relocation activities.

The estimated utility relocation cost for Alternatives 1 and 2 would be approximately $478,000. The estimated utility relocation cost for Alternative 3 would be approximately $538,000.

Alternative 7, the No-Build Alternative, would not affect existing utilities in the project corridor.

Emergency service providers

Several of the emergency service providers who responded to the Caltrans emergency services survey expressed opposition to the No-Build Alternative, because it would do nothing to alleviate the ongoing problem of serious cross-traffic collisions on the Route 101 corridor. They expressed preference for an alternative that would remove at-grade cross traffic from the seven intersections along the corridor and replace it with controlled intersection traffic. They stated that even an increase in response times might be an acceptable trade-off for enhanced safety and reduced potential for collisions along the Route 101 corridor.

Alternatives 2 and 3, which include an interchange at Route 101, are expected to substantially enhance access for emergency service providers compared to Alternative 1. An interchange would generally provide faster access than the existing intersection since an interchange is grade-separated from Indianola Cutoff.

As described in section 3.3, construction of Alternatives 1, 2, or 3 would entail short term, temporary disruption to specific intersections and access points along the Route 101 corridor.

Closing the median openings along the Route 101 corridor permanently could adversely affect provision of emergency services by responding agencies, especially those responding to collisions on Route 101 or who use Route 101 to access emergencies in the surrounding area. For example, the Arcata Fire Protection District (AFPD) currently provides fire, medical, hazardous materials and rescue services from Indianola Cutoff north to Samoa Boulevard. AFPD uses the existing Route 101 intersections to access areas along Old Arcata Road and Indianola Road, as well as the KOA campground. (Source: White, Dave. Fire Chief, Arcata Fire Protection District. Emergency Services Survey response. February 18, 2003.)

Alternatives 1 through 3 would increase out-of-direction travel (and therefore response times) from Arcata to these areas. This could be a substantial impact.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Utilities

Utility relocation would not involve trenching and any ground disturbing activity would be within the area of the project roadway construction subject to the appropriate mitigation and minimization measures discussed in other sections of this document. Service disruption would not be anticipated during construction: Consequently, mitigation or measures to minimize harm are not required.

Emergency service providers

Two lanes of traffic in both directions on Route 101 will be maintained during peak traffic periods during construction. Caltrans would notify emergency service providers in advance of the proposed construction schedule, temporary access restrictions, and possible detour routes prior to making any access modifications. With such advance notifications, impacts on service providers during construction would not be substantial.

Caltrans is working with emergency response agencies to identify appropriate median openings along the Route 101 corridor that could be used by emergency vehicles only. With emergency access openings in place after construction, impacts on service providers would not be substantial.

3.1.6 Traffic and Transportation/Pedestrian and Bicycle Facilities

The traffic section discusses the project's potential effects on the local and regional traffic and circulation, both during construction (construction impacts) and after completion of the project (long-term impacts). This section is summarized from a report entitled *Evaluation of Traffic Impacts of Alternatives on the Route 101 Corridor between Eureka and Arcata* and finalized in November 2006. In addition, an addendum was finalized in November 2006. This report and addendum are available for public review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

The Federal Highway Administration (FHWA) directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects. 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 public will be provided to persons with disabilities.

AFFECTED ENVIRONMENT

The Route 101 Eureka-Arcata corridor is the most heavily traveled roadway segment in Caltrans District 1 — an area that encompasses Del Norte, Humboldt, Mendocino and Lake Counties. Between Eureka and Arcata the average annual daily traffic is expected to increase from 35,000 vehicles per day in 2002 to 54,600 by 2030) on Route 101. Route 101 currently has four-lanes (two-lanes in each direction between Eureka Slough Bridge (in Eureka) and Gannon Slough Bridge (in Arcata) with a posted 50-mph speed limit. Vehicle headlights are currently required to be on 24 hours a day in this segment of the corridor. North of Gannon Slough Bridge in Arcata, the expressway changes to a four-lane freeway with a posted 65-mph speed limit. The existing Route 101 expressway segment has the following dimensions:

- Four traffic lanes (two lanes each direction);
- Two 3.6-meter (twelve feet) wide traffic lanes in each direction;
- 6.7 to 24.4-meters (22 to 80 feet) wide median separating the northbound and southbound lanes;
- 1.5-meter (five-feet) wide inside shoulders;
- 2.4-meter (eight-feet) wide outside shoulders.

There are currently seven at-grade Route 101 local street/driveway access locations within the expressway segment of Route 101 between Eureka and Arcata. Six of these access locations currently have Route 101 median crossings that allow for left-turn on and off movements to and from the local streets/driveways. From south to north they are:

- Cole Avenue – The Route 101 median opening was recently closed at this location; right-turn off from northbound Route 101 and right-turn on to Route 101 vehicle movements are permitted. Cole Avenue connects to businesses and residents on Jacobs Avenue. Airport Road is the only other road that provides access to Jacobs Avenue.
- Airport Road – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. The deceleration and acceleration lanes at this intersection were recently extended. Airport Road connects to businesses and residents along Jacobs Avenue. Cole Avenue is the only other road that provides access to Jacobs Avenue.
- Mid-City Motor World – The Route 101 median at this intersection is currently open and all turn movements to and from Route 101 at this

intersection are permitted. The Mid-City Motor World driveway does not connect to any other local streets.

- Simpson Sawmill – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. The mill driveway does not connect to any other local streets.

- Indianola Cutoff – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. Indianola provides access to local businesses and residents as well as connects to Old Arcata Road.

- Bracut/Mill Yard – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. The driveways on either side of Route 101 at Bracut do not connect to any other local streets.

- Bayside Cutoff – The Route 101 median is currently open and all turn movements to and from Route 101 at this intersection are permitted. Bayside Cutoff provides access to residents and businesses on Old Arcata Road.

See Plan Sheets in Appendix A for the location of these intersections. Most of these intersections (except Bracut on the west side and Simpson mill) have existing acceleration and deceleration lanes that facilitate entering and exiting the expressway at each intersection.

Transportation Modes

The Eureka-Arcata Corridor currently accommodates a number of different transportation modes:

- Murray Field is a small public airport with one runway and no control tower. There are about 100 mostly small privately owned aircraft based at this airport. (Source: fltplan.com) The Airport is located north and east of the Route 101/Airport Road intersection. Airport Road provides the only surface road access to the airport.

- The Northwestern Pacific Railroad is adjacent to, and west of Route 101 between Eureka and Arcata. This railway segment has experienced limited use in recent years since much of the line has been inoperative because of infrastructure damage. The future operation of this railroad to haul passengers or freight remains uncertain.

- Redwood Transit System provides commuter bus service along the corridor between Eureka and Arcata as well as destinations further south and north.

Bicycles and Pedestrians

Within the project limits, Route 101 is a four-lane expressway/freeway between the Eureka Slough Bridge and 11th Street overcrossing. Bicycle access is allowed along the existing 2.4-meter or eight-feet wide paved shoulders of Route 101. On Route 101 between Eureka and Arcata, there are no existing pedestrian crossing elements that allow pedestrians to cross Route 101 such as traffic signals, pedestrian crosswalks/warning signs, pedestrian bridges, or pedestrian tunnels. Within the project limits in Arcata, there are sidewalks that cross Route 101 at Route 255, 7th Street, and 11th Street. In the City of Eureka, the nearest designated pedestrian crossing of Route 101 is at V Street. The northbound Eureka Slough Bridge has a sidewalk which is used mainly by pedestrians and some bicyclists. Pedestrian use on Route 101 is infrequent from Airport Road northward.

Humboldt County's Framework Plan describes bicycle use of the existing transportation system as follows:

> "Bicyclists can use all state, county and city roads. Bicycle Route signs have been placed on the State's Bikecentennial Route (now called the Pacific Coast Bike Route or PCBR). The cities of Eureka, Arcata, and Fortuna all have adopted bicycle master plans. The City of Eureka has adopted a bicycle plan and is seeking funds for implementation. Humboldt County has developed a countywide bicycle plan that proposes to connect the cities, towns and colleges and provide safe access to local, regional, State and Federal parks." (Source: Humboldt County General Plan Volume I - Framework Plan.)

Caltrans classifies the existing Route 101 corridor's on-shoulder bike route as a Class III Bikeway that "designates a preferred bike route through a high demand corridor and provides for shared use with motor vehicle traffic." The right or outside highway shoulder width varies from 2.4 to 3.0-meters (eight to ten feet) wide for the length of the corridor. The outside shoulders on the existing Jacoby Creek and Gannon Slough Bridges are 2.4-meters wide.

The Humboldt Bay Area Bike Map prepared by the Redwood Community Action Agency (RCAA) in 1997 designates Route 101 as an "Intermediate Undesignated Roadway" bicycle route from V Street in Eureka to the Bayside Cutoff. (An Intermediate Undesignated Roadways are described in the map as "Roads, streets, and highways appropriate for bicyclists with a range of skill levels.") From the Bayside Cutoff, the Intermediate Undesignated Roadway route designation then extends to Old Arcata Road and north into Arcata. Bicycle use on Route 101 north of Bayside Cutoff in Arcata is infrequent since there are many road alternatives parallel to Route 101 through Arcata.

RCAA (with funding from the North Coast Unified Air Quality District) completed a Humboldt Bay Area Bicycle Use Study in 1999. This study looked at both intra- and inter-City bicycling behavior in the Eureka-Arcata region. Volunteers were used to count cyclists, as well as to gather data on such issues as helmet use and behaviors such as biking against the flow of traffic. The study found that most Arcata-Eureka bicycle travel occurs on Route 101, with an average of thirty-three riders per day midweek and an average of twenty riders per day on Saturdays. Based on this data, the study concluded that the Route 101 corridor is used more for commuting than for recreational riding. Bicyclists were found to be more active in the spring, summer, and fall months, but they also were documented in appreciable numbers during the rainy winter months. (Source: RCAA Natural Resources Services. *Humboldt Bay Area Bicycle Use Study*. February 1999.)

While it is legal to ride a bicycle on the Route 101 shoulder, and many people do, some bicycle advocates feel that the shoulder is too narrow, given the high speed and volume of vehicular traffic on the road. Caltrans data indicate that there were nine collisions involving bicycles in the Route 101 corridor between January 1992 and April 2002. Of these, seven were injury collisions. Four of the collisions occurred northbound and five southbound. Some of these collisions involved bicyclists hitting cars that were parked in the shoulder area.

Some bicycle activist individuals and groups advocate for the creation of a separate bikeway (Class I bikeway), but creating a separate pathway for bicycles is constrained by wetlands, a railroad line adjacent to Route 101, and Humboldt Bay. The Humboldt County Association of Governments in association with other public agencies and organizations, have been meeting to discuss the feasibility of a separate multi-use trail between Eureka and Arcata. The primary options include locating the trail on, or adjacent to, the existing North Coast Railroad bed (parallel and west of the existing Route 101 roadway). This trail, if constructed, would become part of the California Coastal Trail (CCT). The CCT is a network of public trails for walkers, bikers, equestrians, wheelchair riders and others along the entire California coastline. (See Figure 3-2.) It is currently about two-thirds complete.

Figure 3-2
California Coastal Trail

Safety Corridor

Implementation of the Safety Corridor on Route 101 between the Eureka Slough Bridge and Gannon Slough Bridges was completed in May 2002 as an interim solution for the Eureka-Arcata Corridor Improvement project. The principal elements of the Safety Corridor consisted of engineering components and an enhanced traffic law enforcement period. The engineering components include the following:

- Signage identifying this road segment as a Safety Corridor;
- Reduction of the posted speed limit from 60 to 50 mph;
- Addition of radar speed detection signs;
- Enhancement of headlight section signing;
- Supplementing stop signs at public road intersections with flashing red lights;
- Addition of yellow flashing beacons on Route 101 in advance of public road intersections; and
- Add permanent changeable message signs on public roads in advance of stop signs (to display caution messages).
- A Highway Advisory Radio station was also established.

The activity period, presently no longer in existence, included enhanced traffic law enforcement and increased public education with safety tips on television, radio and print media. The double traffic fine zone ended in January 2006.

ENVIRONMENTAL CONSEQUENCES

Traffic Forecast Model and Alternatives Evaluation Report

A Traffic Evaluation Report was prepared to analyze and evaluate the project alternatives in terms of future traffic conditions within the Eureka-Arcata corridor as well as potential effects to alternate north-south routes. The complete report and addendum are available for review at the Caltrans District 1 Office in Eureka. The anticipated construction completion date of the project (Alternatives 1, 2, or 3) would be in the year 2012. The traffic report includes a value assessment of the project improvements over a twenty-year lifespan, up to the year 2031.

Traffic Forecast Model Development

A Microsimulation traffic forecast model was used to evaluate project alternatives in terms of the predicted change in traffic volumes, Level-of-Service (LOS), and out-of-direction travel distances and delays resulting from out-of-direction travel. When the alternatives to be evaluated increased from three to seven, additional field data was collected to calibrate the model at a reasonable level to yield results within a

statistically acceptable range. A more detailed explanation of the model developed for this project is as follows:

The Microsimulation Traffic Model was used to evaluate six alternatives as compared to the pre-safety corridor conditions in terms of change in the traffic volumes on alternate routes, and out of direction travel delay cost. Eighteen zones were chosen to reasonably represent the origin and destination of all travelers within the road network and are connected by links (refer to Figure 3-3 from the November 2005 Traffic Evaluation Report). The vehicles travel between the zones using links representing the various roadway segments that are defined as portions of a roadway facility between intersections. The links are primarily defined by lane width, median width, speed limit, and urban/suburban classification.

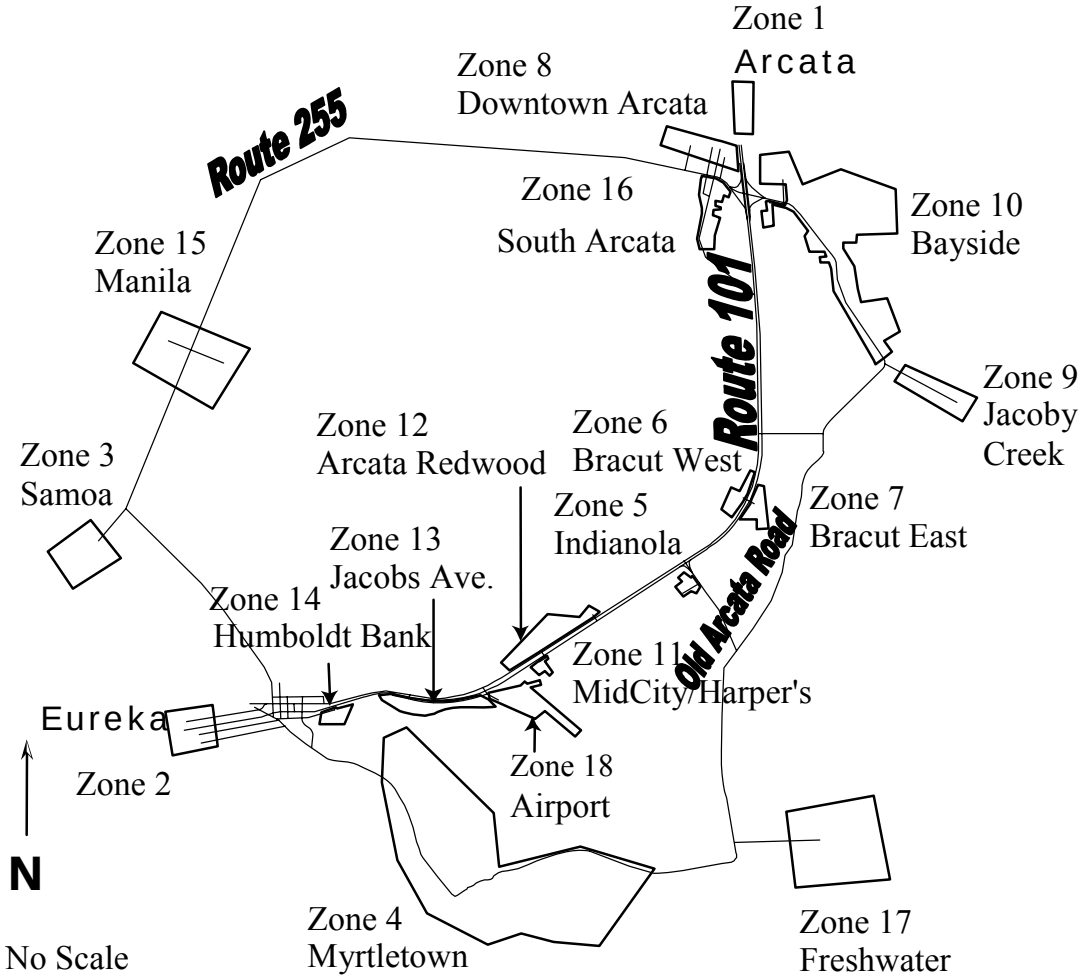


Figure 3-3

The numbers of vehicles per hour (vph) that travel from one zone to another zone per hour are defined in the model as input values. In the model, vehicles are released onto links within the various zones. Vehicles will travel to their specified destination zone using a route comprised of a series of links. This determination is based on the travel time of a potential route randomly assigned by the program and combines the model results in producing an "average" outcome for each set of output ran. The model determines the specific route a vehicle travels using a user-delay cost algorithm modified by other driver behavior parameters such as driver familiarity with the road network and driver aggressiveness.

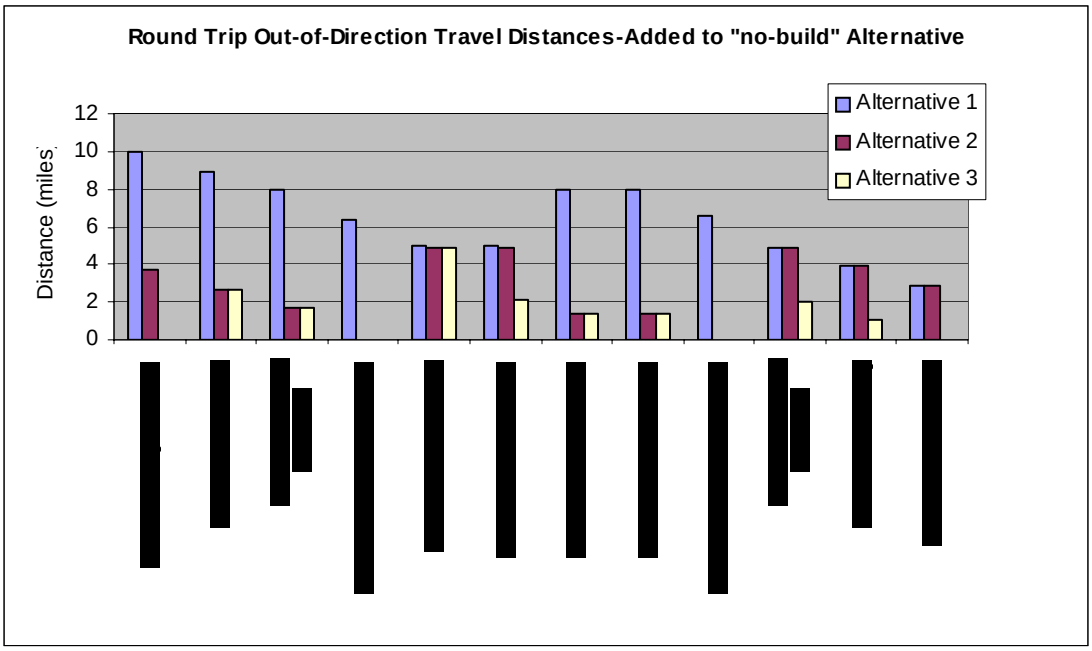
Travel Distance and Time

Out-of-direction travel distance is defined as the increased distance traveled for trips made from origin to one destination due to changes to the existing highway. All three Build Alternatives include Route 101 median closures, which would restrict access at local intersections resulting in out-of-direction travel and delay. The increased out-of-direction travel distance is determined by the difference in distance traveled for Alternatives 1 through 3 compared to the existing highway (without median closures). The out-of-direction travel distance in miles was calculated for round-trips within the Eureka-Arcata Corridor that would be affected by median closures (Table 3-2 and the corresponding chart).

Table 3-2
Round trip out-of-direction travel distances in miles along the Eureka-Arcata Corridor

Trip	Alternative 1	Alternative 2	Alternative 3
Eureka Zone to Airport Rd Zone	10.0	3.7	0.0
Eureka Zone to Mid-City Zone	8.96	2.62	2.62
Eureka Zone to Arcata Redwood Zone	8.0	1.7	1.7
Eureka Zone to Indianola Zone	6.34	0.0	0.0
Eureka Zone to Bracut East Zone	4.94	4.9	4.9
Eureka Zone to Bracut West Zone	4.94	4.9	2.17
Arcata Zone to Bracut West Zone	7.94	1.4	1.4
Arcata Zone to Bracut East Zone	7.94	1.4	1.4
Arcata Zone to Indianola	6.54	0.0	0.0
Arcata Zone to Arcata Redwood Zone	4.9	4.9	2.0
Arcata Zone to Mid-City Zone	3.9	3.9	1.04
Arcata Zone to Airport Rd Zone	2.9	2.9	0.0

Out-of-direction travel distance would result for all Build Alternatives with Alternative 1 having the greatest distance added.



The traffic forecast model predicted travel time for all project alternatives from one zone to another based on changes to the existing roadway facility in the year 2031. The change in travel time is evaluated for trips as the difference in travel time between Alternatives 1 through 3 as compared to the existing condition. The trips are from Eureka and Arcata to the Route 101 local streets/driveways including: Airport Road at Murray Field, Mid-City Motor World, Simpson sawmill, Indianola Cutoff, and Bracut on the east (east side of Bracut includes access to the KOA and Resale Lumber) and the west side (west side of Bracut includes access to the Mill Yard) of Route 101.

Travel times are based on a posted 65 mph speed limit where median crossings have been eliminated, and 50 mph where medians crossings are maintained or signalized. The No-Build alternative maintains posted speed limits as they were prior to the establishment of a Safety Corridor. 65 mph was the prevailing speed in the Corridor prior to the establishment of a Safety Corridor with the posted speed at 60 mph.

Most of the round trips are longer for the three Build Alternatives because the proposed Route 101 median closures cause out-of-direction travel. Alternative 1 projected travel times were the highest of the three Build Alternatives. Compared to the existing condition, in the year 2031, Alternative 1 travel time increased for all trips.

Change in travel time was used to assess a driver delay cost for Alternatives 1 through 3. Driver delay cost is the dollar value of time to the motoring public from increased or decreased travel time. The cost associated with increased travel times are reported in Table 3-3 for each alternative. Alternative 1, which involves closing all at-grade intersection median crossings, without the benefit provided by an interchange and signalized intersection in the other alternatives, results in the highest projected delay and out-of-direction impacts. These impacts are severe for the traveling public as well as low-income residents identified in Section 3.1.4.

Table 3-3
Annual Vehicle-Hours of Increased Delay and Cost on Route 101 between Eureka and Arcata for Alternatives 1 through 3 compared to the Existing Condition

	Annual Vehicle-Hours of Delay	**Annual Cost**
Alternative 1– Close Route 101 medians	6,704	$54,943
Alternative 2 – Same as Alternative 1, plus construct interchange at Indianola Cutoff	3,063	$16,460
Alternative 3 – Same as Alternative 2, plus relocate and signalize Route 101/Airport Road	1,587	$13,007

Project Purpose – Safety

Part of the project purpose includes reducing the number of fatal plus injury collisions at each intersection to below the 2001 statewide average of fatal plus injury collisions for projected traffic volumes at Year 2031. The number of fatal plus injury collisions of a proposed alternative is estimated by multiplying the collision rate of similar facilities statewide by the projected traffic volumes. Statewide averages were calculated for the Year 2031 using results from the Microsimulation model. Statewide average collision rates are dependent on the intersection type and location (rural, suburban or urban). The existence of a safety corridor was not considered in modeling projected collision rates. Implementation of the Eureka-Arcata Safety Corridor on traffic operation and safety are discussed separately later in this section.

Alternatives 1 and 2 will improve safety by eliminating the existing left-turn conflict potential at Route 101 median crossings. Alternative 3, which includes signalization at Route 101 and Airport Road, requires realigning the Airport Road intersection due to the close proximity of the intersections of Airport Road/Route 101 and Airport Road/Jacobs Avenue. When simply comparing current statewide average collision rate groups, the Safety Conformance Criterion is not met with the installation of a traffic signal (included under Alternative 3). However, it is possible to reduce collision rates at signalized intersections with the addition of carefully planned and appropriately designed collision modification factors. Features such as rumble strips, ITS (Intelligent Transportation System) technology (e.g. electronic warning message

signs), and Red Light Run Photo Enforcement, if supported and funded by the City of Eureka, could be factors used at this location to meet the Safety Conformance Criteria. Red Light Run Photo Enforcement has been proven to be effective at improving driver compliance with traffic control devices (Report 500 National Cooperative Highway Research Program, Volume 12: A Guide for Reducing Collisions at Signalized Intersections.)

Project Purpose – Level-of-Service (LOS)

Roadway Level-of-Service (LOS) is a measure of roadway traffic congestion and serves as a benchmark to determine whether new development would exceed the existing or preferred LOS. There are six LOS letter grades as follows:

- **LOS A** describes a roadway condition of free traffic flow, with low traffic volumes and high speeds.
- **LOS B** describes a condition of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation.
- **LOS C** describes a condition of mostly stable flow, but speeds and maneuverability are more closely constricted by the higher volumes.
- **LOS D** describes a condition that approaches unstable flow, with tolerable operating speeds, however driving speed is considerably affected by changes in operating conditions.
- **LOS E** describes a condition that cannot be characterized by speed alone. Traffic speeds are lower than in Level D, with volume at or near the capacity of the highway.
- **LOS F** describes a condition in which the operating speeds are controlled by stop-and-go mechanisms, such as traffic lights. This is called forced flow operation. The stoppages disrupt the traffic flow so that the volume carried by the roadway falls below its capacity; without the stoppages, the volume of traffic on the roadway would be higher, or in other words, it would reach capacity.

It should be noted that LOS is a measure of a roadway segment's (zone's) efficiency at moving automobiles through the zone. By definition, it places a high emphasis on the free-flowing speeds of autos and does not give consideration to the comfort or safety of other roadway users such as bicyclists or pedestrians.

Intersection LOS: Level of Service. This is a measure of the average delay experienced by each vehicle passing through an intersection. It can be measured for the vehicles making each directional turning movement, using each approach leg, or

as a composite average value for all vehicles using the intersection. Similar to open roadway level of service, it is reported with a letter grade designation ranging from A to F. An LOS A represents insignificant delay (less than 10 seconds per vehicle); LOS F represents significant waiting time, more than 50 seconds per vehicle for intersections with non-existent or inadequate signals or more than 80 seconds per vehicle for intersections with signals.

The traffic evaluation report results include forecasts during the peak period travel, which typically occurs in the afternoon and is denoted by PM peak in the tables that follow.

Left-turns at Non-signalized Intersections: Non-signalized left-turns on to, and off of Route 101 are allowed at all intersections for Route 101 without improvements. The year 2031 Level-of-Service (LOS) for left-turns onto Route 101 is F at all median access locations, except at the Simpson mill intersection where it is LOS E, for Alternative 7 (No-Build). No left turns would be allowed for Alternatives 1 and 2, while Alternative 3 would allow for a controlled left turn movement at Airport Road. For Alternative 7 No-Build, non-signalized left-turns off of Route 101 are below LOS D at Indianola Cutoff and are at or better than LOS D for the remaining intersections (Table 3-4).

Table 3-4
Projected Level-of-Service (LOS) for left-turn movements off of Route 101 at non-signalized intersections using year 2031 PM peak hour traffic volumes

	Highway Without Improvements
Airport Road	C
Mid-City Motor World	C
Green Diamond (Simpson)	C
Indianola Cutoff	F
Bracut (West)	D
Bracut (East)	D
Bayside Cutoff	C

Right-turns at Non-signalized Intersections: Non-signalized right-turns on to, and off of, Route 101 would be allowed at all intersections (excluding the signalized intersection at Airport Road for Alternative 3) and would be at or better than LOS C (Table 3-5) for all alternatives for traffic volumes projected to Year 2031

Table 3-5
Projected Level-of-Service for right-turn movements on to Route 101 at non-signalized intersections using Year 2031 PM peak hour traffic volumes

	Alt 1	**Alt 2 (NB/SB)**	**Alt 3 (NB/SB)**	**Highway without Improvements**
Airport Road	C	C	N/A	C
Mid-City Motor World	C	C	C	C
Simpson	B	B	B	B
Indianola Cutoff	C	C/C	C/C	C
Bracut (West)	B	B	B	C
Bracut (East)	C	C	C	C
Bayside Cutoff	C	C	C	B

LOS for Intersections Unique to Certain Alternatives:

Alternative 2 includes two additional non-signalized intersections at the northbound and southbound ramps at Indianola Cutoff. Three vehicle traffic movements are subjected to traffic control delay at the two intersections: northbound left-turns (vehicles traveling north and turning around at Indianola Cutoff), southbound left-turns at the southbound intersection and eastbound left-turns at the northbound intersection (vehicles traveling south and turning around at Indianola Cutoff). The LOS for the PM peak hour volumes projected to year 2031 at the ramps at the Indianola Interchange for the northbound left, southbound left, and eastbound left-turning movements are B, B and A, respectively.

For the Route 101 through lanes, all Alternatives have an LOS C for northbound and LOS B for southbound for PM peak hour volumes projected to the Year 2031 for Alternatives 1, 2, 3, and 7.

The Level-of-Service (LOS) at the signalized intersection of Route 101 and Airport Road during the PM peak hour is C with a delay of 22 seconds for Alternative 3.

Project Effects on Local Roads and Intersections

The Level-of-Service was also calculated at four intersections along Old Arcata Road (OAR) between Eureka and Arcata (Freshwater Road, Indianola Cutoff, Bayside

Cutoff and Jacoby Creek Road) to assess potential effects to alternate north/south routes from changes in traffic patterns of the proposed alternatives on Route 101. See Plan Sheets in Appendix A for intersection locations.

Table 3-6 shows left-turn movements onto Old Arcata Road (OAR) from Freshwater Road deteriorates to LOS F for all alternatives, including Alternative 7 (No Build), during the AM and PM Peak Hour.

Table 3-6
Level-of-Service at Freshwater Road and Old Arcata Road (OAR)
for Year 2031 volumes, during AM/PM Peak Hour

Alternatives	Left onto OAR	Right onto OAR	Left off OAR
1, 2, 3 and Existing Condition without Improvements	F/F	B/B	A/A

Table 3-7 shows the left-turn movement onto Old Arcata Road (OAR) from Indianola Cutoff, during the AM and PM Peak Hour.

Table 3-7
Level of Service at Indianola Cutoff and Old Arcata Road
for year 2031 volumes, during AM/PM Peak Hour

Alternative	Left on to OAR	Left off OAR
1	B/C	A/A
2	B/B	A/A
3	B/C	A/A
Existing Condition without Improvements	B/B	A/A

Table 3-8 shows the left-turn movements on to, and off of Old Arcata Road from Bayside Cutoff for the AM and PM Peak Hour are at or better than LOS C.

Table 3-8
Level of Service at Bayside Cutoff and Old Arcata Road
for year 2031 volumes, during AM/PM Peak Hour

Alternative	Left on to OAR	Left off OAR
1	A/B	A/B
2	A/A	A/A
3	A/A	A/A
Existing Condition without Improvements	A/B	A/A

Table 3-9 shows that there is no effect to the LOS at Jacoby Creek Road for left-turns onto Old Arcata Road. Left-turns off of, and right-turns on to, Old Arcata Road at Bayside Cutoff are at or better than LOS B.

Table 3-9
Level of Service at Jacoby Creek Road and Old Arcata Road
for year 2031 volumes, during AM/PM Peak Hour

Alternative	Left on to OAR	Right on to OAR	Left off OAR
1	C/F	B/D	A/B
2	C/F	B/C	A/B
3	C/F	B/C	A/B
Existing Condition without Improvements	C/F	B/C	A/B

Traffic modeling indicates there is no effect to the LOS at Jacoby Creek Road and Old Arcata Road for left-turns on to Old Arcata Road during the PM Peak Hour. All other turn movements during both AM and PM Peak Hours are at or better than LOS C.

Tables 3-7 through 3-9 indicate that none of the three Build Alternatives would adversely effect or benefit intersections on Old Arcata Road between Eureka and Arcata.

Impacts on LOS at 4th and 5th Streets (Southbound and Northbound Route 101, respectively) at V Street in Eureka were evaluated for Alternatives 1, 2 and 3 for the year 2031. The calculations include a recently constructed improvement project consisting of adding a dedicated left-turn lane on the 4th Street approach to V Street; constructing 3 through lanes and a dedicated left-turn lane for the 5th Street approach to V Street; and adding a second through lane on the southbound V Street approach to 5th Street between 4th and 5th Streets. The calculated LOS for all Alternatives for 4th and V Streets and 5th and V Streets are B and C, respectively.

The signalized intersection at Myrtle Avenue and West Avenue in Eureka during the AM and PM peak hours are C and D. See Table 3-10.

Table 3-10 Intersection Delay (seconds) and Level-of-Service (LOS) at the intersection of Myrtle Avenue and West Avenue for the AM and PM peak hour volumes projected to the Year 2031			
		Delay	**LOS**
AM	Alternative 3	24.7	C
	Existing Condition	23.8	C
PM	Alternative 3	36.0	D
	Existing Condition	48.6	D

Impacts on the LOS for four different weave movements* at the existing Route 101/255 interchange in Arcata were evaluated for Alternatives 1, 2 and 3. For all three alternatives, the LOS for the four traffic weave movements are A (northbound and southbound) and B (westbound and eastbound).

The LOS was also calculated at five intersections along State Route 255 that included Peninsula Drive, Pacific Road, Lupin/Victor Road, Carlson Drive and Young Lane in Manila to assess impacts to alternative North/South routes as a result in changes in traffic patterns due to the proposed alternatives on Route 101.**

Table 3-11: Level-of-Service at Route 255 and Peninsula Drive, Alternatives 1 through 3, for Year 2031 volumes (AM/PM Peak Hour).			
Alternatives	Left off NB SR 255	Left onto NB SR 255	Right onto SB SR 255
1 & 2	A/A	B/C	A/B
3	A/A	B/B	A/B

* Any fixed object too close to the edge of the traveled way can pose potential hazards for errant vehicles or vehicles making emergency maneuvers. Removing or shielding fixed objects that are within nine-meters or thirty-feet from the edge of the traveled way, or clear recovery zone, would enhance safety.

* **Weaving** - This term describes the interaction of two traffic streams moving in the same direction merging and then diverging in a relatively short distance. In other words, crossings of portions of traffic streams must occur. **Weaving Length** - The distance between an on ramp and the next off ramp, in which traffic entering the freeway must merge with through traffic, and exiting traffic must change lanes (weave) or stay in the outside lane in order to use the off ramp.

Table 3-12: Level-of-Service at Route 255 at Pacific Road, Alternatives 1 through 3, for Year 2031 volumes (AM/PM Peak Hour).						
Alternatives	Left off of NB SR 255	Left off of SB SR 255	Left onto SB SR 255	Right onto NB SR 255	Left onto NB SR 255	Right onto SB SR 255
1, 2 & 3	A/A	A/A	B/C	A/B	B/C	A/B

Table 3-13: Level-of-Service at Route 255 and Lupin /Victor Road, Alternatives 1 through 3, for Year 2031 volumes (AM/PM Peak Hour).						
Alternatives	Left off of NB SR 255	Left off of SB SR 255	Left onto SB SR 255	Right onto NB SR 255	Left onto NB SR 255	Right onto SB SR 255
1, 2 & 3	A/A	A/A	B/C	A/B	B/C	B/C

The expected Level-of-Service at Carlson Drive and Young Lane will be at LOS A and B.

Table 3-14: Level-of-Service at Route 255 and Carlson Drive, Alternatives 1 through 3, for Year 2031 volumes (AM/PM Peak Hour).				
Alternatives	Left off of NB SR 255	**Left off of** SB SR 255	Left onto SB SR 255	Right onto NB SR 255
1, 2 & 3	A/A	A/A	B/B	A/A

Volume Effects on Local Roads. The percent change in volumes for each alternative for year 2031 was calculated using an average volume weighted by the distance of each segment for Routes 101, Route 255, and Old Arcata Road (Table 3-15). Alternative 1, as compared to Alternative 7 (No-Build), is estimated to increase traffic volumes by 50% in year 2031 on Old Arcata Road. Old Arcata Road is a two-lane county road that extends from Eureka to Arcata and is approximately 16-km (ten miles) long. There are many access points along Old Arcata Road; some are public or private roads, but most of the access is from driveways with housing immediately adjacent to the roadway. Over 30 percent of Old Arcata Road effectively has no paved shoulders. In addition there is poor sight distance on curves, non-standard intersections, and ditches and power poles close to the edge of pavement. These conditions leave little room for the bicyclists and pedestrians that also use the road or for recovery room for errant vehicles or room for disabled cars. Old Arcata Road passes through the community of Bayside, which has a K through 8th grade public school, post office, and other businesses that are accessed immediately from Old Arcata Road. See Figures 3-4 and 3-5. In 2002, the Annual Average Daily Traffic volume on Old Arcata Road was 5,660 vehicles per day (source "Interim Solutions

For the Route 101 Eureka-Arcata Corridor" prepared by Caltrans District 1.) If Alternative 1 were constructed, this volume would increase by 50%.

Figure 3-4
Photograph of Old Arcata Road between Eureka and Indianola Cutoff

Figure 3-5
Photograph of Old Arcata Road between Indianola Cutoff and Arcata

The Microsimulation model predicted a 12% and 15% increase in traffic on Route 255. After the establishment of the Safety Corridor, a 30% increase occurred; consequently, it is anticipated that the long term change will be at least 12% and up to 30% as a result of the Safety Corridor.

Table 3-15
Projected increase in traffic volumes of weighted average by distance for Alternatives 1 through 3 as compared to the pre-Safety Corridor (posted speed limit 60 mph) condition within the Eureka-Arcata Corridor for the year 2031.

	Alternative		
	1	**2**	**3**
Route 101	6%	5%	1%
Route 255	0%	5%	1%
Old Arcata Road	49%	6%	-2%

Segment Collisions On Local Roads

Segment collisions (injury and fatal) are defined as collisions that occur outside the defined area of an intersection. Statewide average collision rates for segments are in terms of collisions per million vehicle miles (as compared to intersection collisions which are in terms of collisions per million vehicles). Hence, long segments of roads are more sensitive to changes in traffic volume than intersection collisions. The predicted increase of traffic volume on Old Arcata Road for Alternative 1, as shown in Table 3-12, is expected to increase the number of segment collisions. Segment collisions on Route 255 and Old Arcata Road are not expected to increase for Alternatives 2 and 3.

Intersection Collisions

Intersection collisions (injury and fatal) are defined as collisions that occur within a specific area of an intersection. Intersection collisions on Route 101 outside the Eureka-Arcata Corridor Limits, Route 255 and Old Arcata Road are not expected to change for all three alternatives.

Safety Corridor

A Safety Corridor is included in this section because Alternative 7 includes many Safety Corridor elements. A traffic forecast model predicted that without an extended activity period, Route 101 Eureka-Arcata corridor traffic speeds would increase to pre-Safety Corridor conditions. Traffic volume counts prior to, and after the

establishment of the Safety Corridor indicate traffic volumes increased by 30% on Route 255 from implementation of the Safety Corridor. Traffic volume counts on Route 101 did not show a substantial percentage change in traffic volume on Route 101. Monitoring data is inconclusive with respect to changes in traffic volume on Old Arcata Road because of insufficient amount of traffic data prior to the establishment of the Safety Corridor. (Source: Caltrans District 1 2006 Safety Corridor Fourth-Year Report.)

The traffic model evaluates different route choices by assessing a driver cost (in terms of travel time) on each route. It does not evaluate driver behavior based on education or enforcement. Further, statewide average collisions do not consider the presence of a safety corridor. To assess the anticipated affects of the Safety Corridor as a permanent alternative, a review of other safety corridors within the state was completed.

Thirty-eight Safety Corridors were identified in California with 29 of them having collision data prior to their establishment, during the enhanced enforcement period and after the period ended. These 29 corridors are considered in this report. Twenty corridors are two-lane conventional highways, four are four-lane expressways, and one is a combination of two-lane conventional and four-lane expressway. One corridor is a combination of two-lane conventional and four-lane freeway, two are strictly four-lane freeway, and one is a combination of four-lane and six-lane freeway.

Fatal plus injury collision data for each safety corridor on the study were obtained from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) for five years before the enhanced enforcement period phase, during the enhanced enforcement period and five years after (where available).

The average intersection fatal plus injury collision rate before, during, and after the enhanced enforcement period for all 29 safety corridors is reduced with the implementation of the enhanced enforcement period, dropping from 0.169 to 0.145 collisions per million vehicles (14 percent). Following the end of the enhanced enforcement period, the fatal plus injury collision rate increases to nearly the same levels as before, rising from 0.145 to 0.163 collisions per million vehicles (13 percent). The enhanced enforcement period duration ranged from one to three years. Seventy-six percent of the safety corridors had an enhanced enforcement period of either one or 1.5 years. The average daily traffic ranged from 1,300 to 65,300 vehicles per day.

Fifteen safety corridors in the study had concurrent projects intended to improve safety in progress (some even in construction) during the enhanced enforcement period. To measure the effectiveness of constructing these projects during or after the enhanced enforcement period, the collision data was separated into one group with a project and another without.

The average intersection fatal plus injury collision rate before, during, and after the enhanced enforcement period for safety corridors without a concurrent project decreased from 0.146 to 0.094 collisions per million vehicles (35 percent) with the implementation of the enhanced enforcement period. Following the end of the enhanced enforcement period, intersection fatal plus injury collision rates increased from 0.094 to 0.155 collisions per million vehicles (65 percent). This rate represents a net increase of seven percent over the original condition before the safety corridor. The average daily traffic for these corridors ranged from 3,200 to 21,000 vehicles per day. The enhanced enforcement period duration was between one and three years.

This reduction corresponds to a net decrease in the intersection fatal plus injury collision rate of nine percent from the original condition before the safety corridor. The average daily traffic for safety corridors with a concurrent project ranged from 1,300 to 65,300 vehicles per day. The enhanced enforcement period lasted between one and 1.5 years. Consequently, Safety Corridors on four-lane expressways reduced broadside collisions.

The proportion of each type of collision experienced before, during, and after the enhanced enforcement period is substantially changed for four-lane expressways; there is no substantial change on two-lane conventional highways. For four-lane expressways, the proportion of broadside fatal plus injury collisions prior to, during, and after the enhanced enforcement period are 52 percent, 35 percent, and 55 percent, respectively (Figure 3-6).

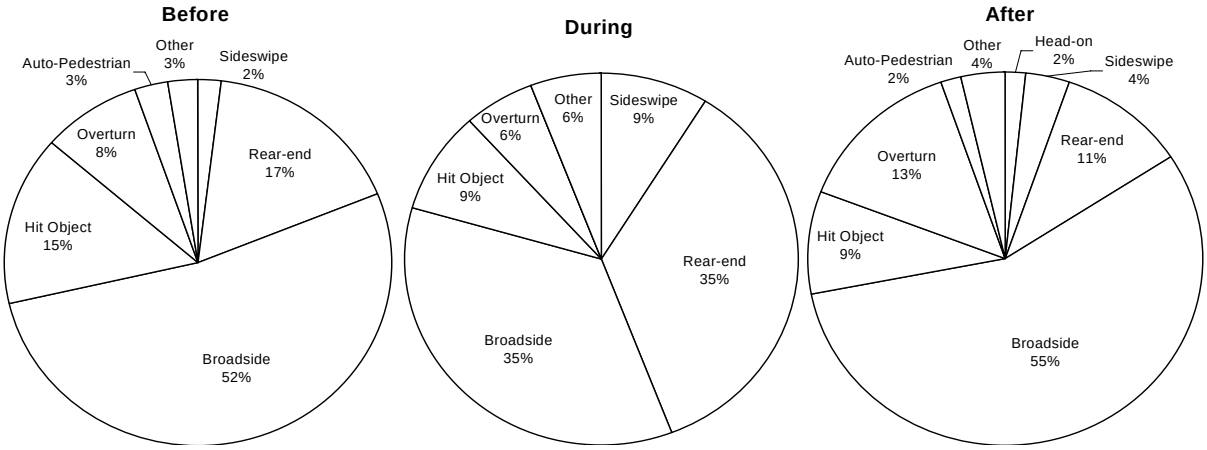


Figure 3-6
The proportion of each type of fatal plus injury collision on four-lane expressways before, during and after enhanced enforcement periods.

Of the 29 Safety corridors evaluated, one has secured additional funding to maintain the enhanced enforcement phase in place: Highway 17 in Santa Cruz county. The Santa Cruz County Regional Transportation Commission (SCCRTC) and Metropolitan Transportation Commission (MTC) funding agreement provided a combined $100,000 per year to fund extra California Highway Patrol (CHP) enforcement on Highway 17 from Santa Cruz to Los Gatos between January 2003 and December 2005. The SCCRTC funds pay for extra enforcement provided by the Santa Cruz area CHP office and the MTC funds pay for extra enforcement provided by the San Jose area CHP office. With the implementation of the initial enhanced enforcement period, the highway fatal plus injury collision rate decreased from 0.64 to 0.41 collisions per million vehicle miles (36 percent). However, in the extended enhanced enforcement period, the collision rate increased from 0.41 to 0.62 collisions per million vehicle miles, which is almost back to pre-implementation rates.

The following conclusions can be inferred to the Eureka-Arcata Corridor. The establishment of the Safety Corridor resulted in reduced collision rates consistent with all other Safety Corridors considered. Without geometric structural improvements intended to reduce or eliminate collisions related to median crossings within the corridor, collision rates are expected to increase back to pre-safety corridor levels, regardless of an extended enhanced enforcement period. Furthermore, if an extended enhanced enforcement period is not maintained, the number of collisions is eventually expected to increase to pre-safety corridor levels. Based on these findings, Alternative 7 does not meet the project Need and Purpose in terms of safety.

Railroad

North of Airport Road to Indianola Cutoff, the Route 101 right-of-way width is approximately 77-meters (253-feet) and is bounded by the Northwestern Pacific Railroad to the west. The proposed extension and widening of the acceleration and deceleration lanes at the Simpson sawmill would require extending the roadway fill slope within the railroad right-of-way. A permanent slope easement from the North Coast Railroad Authority (NCRA) would be required. A temporary construction easement would also be needed from NCRA for staging for all Build Alternatives. At the Bracut Industrial Park on the west side of Route 101, the southbound acceleration and deceleration extension work would also require a permanent slope easement from the NCRA. Alternatives 2 and 3 include constructing an interchange at Indianola Cutoff, which would require a temporary construction easement from NCRA for detouring traffic.

None of the Build Alternatives would temporarily or permanently impact the potential future operation of the railroad.

Public Transit

None of the Build Alternatives would temporarily or permanently impact public transit (bus) operations. There are no bus stops on Route 101 between the Eureka Slough Bridge and the Route 101/255 interchange in Arcata.

Humboldt County Airport (Murray Field)

None of the project alternatives would affect the flight operations at the Murray Field Airport. For Alternative 3, the proposed additional lane has been aligned into the Route 101 roadway median to avoid a conflict with airport flight paths. Alternative 3 would likely require an encroachment permit for construction in the southwest corner of Murray Field, which is no longer in use, for the realignment of Airport Road intersection with Route 101. The proposed construction work would not require taking any buildings on the airport or affect the present or future operation of the airport.

Public Transit

None of the Build Alternatives would temporarily or permanently impact public transit (bus) operations. There are no bus stops on Route 101 between the Eureka Slough Bridge and the 11th Street overcrossing in Arcata.

Bicycle and Pedestrian Travel

While Alternatives 1 through 3 would restrict left-turn movements along the Route 101 Eureka-Arcata Corridor, none of the project alternatives propose to reduce or eliminate the number of right-turn on and off movements at the Route 101 intersections. However, all Build Alternatives include extending the existing acceleration and deceleration lanes at the Route 101 intersections, which is expected to enhance bicycle safety somewhat by reducing the likelihood of cars turning suddenly across the path of a bicyclist. Bicycle safety would be enhanced with construction of wider shoulders and bicycle bridge rail on the Jacoby and Gannon Slough Bridges.

For bicyclists commuting from Eureka and Arcata, none of the project alternatives would increase travel distances or times. For bicyclists whose destination may be one of the businesses, the mobile home park, campground or other median access point along the Route 101 corridor, travel distance could be increased by as much as 16 kilometers or ten miles under Alternative 1 (refer to Table 3-2). Consequently, a substantial increase in travel time would make it much less likely that employees would commute to work at businesses along the corridor or that persons on bikes would patronize businesses along the roadway (although there is no information on

how much, if any, local business patronage is from bicyclists, it is likely that they do not patronize many of the existing businesses, because of the types of goods and services they offer).

Alternative 1 is predicted to result in a 49% increase in traffic volume on Old Arcata Road between Indianola Cutoff and Freshwater Road in the year 2031. Although not as heavily used for bicycling as Route 101, this segment of Old Arcata Road would be less desirable for bicyclists with a substantial increase in motor vehicle traffic.

None of the Eureka-Arcata Corridor Improvement project alternatives would preclude construction of the proposed California Coastal Trail alignments currently under discussion.

Alternative 7 would not have any direct impact on bicyclists or pedestrians. However, the increasing traffic volumes, the continuing operational conflicts, and the increasing collision rates associated with alternative 7 could result in a real or perceived deterioration in bicyclist safety over time. A highway "operational conflict" occurs when vehicles are merging or turning across lanes of opposing traffic. On Route 101, operational conflicts occur because of left-turns and left-merge on and off movements at median crossings within the Route 101 Corridor. Operational conflicts can lead to driver confusion and therefore increase collisions.

The only existing sidewalks within the project construction limits are on the overcrossings in Arcata.

Summary of Long-Term (Post-Construction) Adverse Effects

The number of injury and fatal collisions at intersections within the project limits is expected to increase by the year 2031 with Alternative 7, the No-Build Alternative, as the volume of traffic increases on Route 101.

Alternative 7 (No-Build) would result in substantial degradation of Level-of-Service (LOS) for left-turn movements off of Route 101 at non-signalized intersections using year 2031 PM peak hour traffic volumes at Indianola Cutoff and Bracut intersections. The year 2031 Level-of-Service (LOS) for left-turns onto Route 101 is F at all median access locations, except at the Simpson mill intersection where it is LOS E, for Alternative 7 No-Build.

Out-of-direction travel distance for local trips to businesses and residents would increase for all Build Alternatives with Alternative 1 having the greatest distance added. Through traffic (drivers not making stops within the Eureka-Arcata corridor) on Route 101 would generally not be affected by any of the project alternatives, except for the No-Build Alternative, which would maintain the existing posted speed limit.

The LOS for left-turns onto Old Arcata Road for all alternatives during both the AM and PM Peak hours at Freshwater Road and Bayside Cutoff is predicted to be F. The LOS for left-turns onto Old Arcata Road at Jacoby Creek Road during the PM Peak Hour for all alternatives is also predicted to be F. All other turn movements for all alternatives are predicted to be LOS D or better.

Alternative 1 would increase traffic volumes on Old Arcata Road by 49% by the year 2031. As a result, segment collisions are expected to increase on Old Arcata Road and future transportation projects such as shoulder widening and left turn lanes could be necessary.

Refer to Section 3.1.4 – Community Impacts in this chapter for information on how this project would affect traffic patterns for residents and businesses.

Traffic During Project Construction

Construction activities include building the Indianola Cutoff interchange (Alternatives 2 and 3 only) as well as bridge work at Gannon Slough and Jacoby Creek. The structural work and roadway work are expected to delay traffic over a period two years.

Bicyclists and Pedestrians During Construction

During construction of any of the Build Alternatives, bicyclists would be affected by temporary lane closures or other roadway use restrictions and the presence of construction workers, vehicles and materials. All of the Build Alternatives will have some temporary construction-related interruptions of bicycle travel.

Caltrans will prepare a traffic management plan that will include planning to safely detour bike traffic with the motorized vehicle traffic lane detours during construction. Caltrans would also require construction contractors to sweep debris from shoulder areas.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

As discussed in the Environmental Consequences section, there are various unavoidable adverse effects to the roadway network anticipated for all alternatives by the year 2031, including the No-Build Alternative.

Construction of an interchange at Indianola Cutoff (Alternatives 2 and 3) would substantially improve the out-of-direction travel for local residents and businesses along Jacobs Avenue and in Bracut. The annual vehicles hours of increased delay to motorists is reduced more than 50% with the construction of Alternative 2 and the annual

cost associated with that delay is less than 30% of that associated with Alternative 1. In addition, an interchange at Indianola Cutoff would prevent substantial traffic diversion to Old Arcata Road that is expected to occur if Alternative 1 were constructed. Old Arcata Road is less suited to accommodate higher traffic volumes and speeds than Route 101. Alternative 3 includes construction of a signalized intersection at Route 101 and Airport Road, which would further minimize out-of-direction travel for businesses and residents on Jacobs Avenue if the Route 101 median openings were closed.

Traffic During Construction

Construction activities associated with implementation of Alternatives 1, 2, and 3 would cause limited temporary disruption of local access to homes and businesses along the Route 101 corridor.

Bridge Construction Work Sequence and Traffic Detouring

Project construction for any of the three Build Alternatives includes replacing the southbound Jacoby Creek Bridge. Lane closures during daylight hours will be avoided or at least minimized during bridge construction work. First, the existing northbound Jacoby Creek and Gannon Slough Bridges would be widened prior to replacing the southbound Jacoby Creek Bridge. This work would be done by equipment staged on the shoulders so both lanes of Route 101 traffic could remain open. The northbound Jacoby Creek Bridge would be widened to temporarily accommodate a total of three lanes of traffic: two lanes of northbound and one temporary lane for southbound traffic. Once the northbound Jacoby Creek Bridge is widened and ready for a lane of southbound detour traffic from the southbound bridge, the demolition can begin on the southbound Jacoby Creek Bridge. The other lane of southbound traffic would stay on one side of the existing southbound Jacoby Creek Bridge, while the other half of the southbound bridge is removed and replaced. Then that lane of southbound traffic would be diverted to the new half-width southbound bridge while the second half of the bridge is replaced. After returning traffic to the replaced bridge, the temporary detour paving would be removed, and the fill material placed within the median would be removed and/or re-graded to conform to the existing bridge fill slopes. The northbound bridges would likely be widened the first year and the southbound Jacoby Creek Bridge replaced the following year.

A comprehensive traffic management plan (TMP) will be prepared prior to construction to maintain circulation on streets and arterials for the duration of the two year construction period. The TMP will be implemented during construction and would minimize disruption to travelers, business owners, customers and residents. The TMP would require, but not be limited to, standard measures such as:

- Limiting long-term lane closures; during peak travel periods, two lanes of traffic in each direction on Route 101 will be maintained. If lane and ramp closures were necessary, they would be limited to night and off-peak hours

- Placing work hour restrictions on both the Route 101 mainline and business accesses;

- Local streets and private driveways will be kept open during the construction of any of the Build Alternatives.

- Advanced changeable message signs and broadcast media notifications, detour plans, and other contingency plans.

- Prohibiting any road work on holidays (such as the 4th of July or Labor Day weekend) or when special events are scheduled;

- Provide advance notification of planned highway detours and road closures to local cities and the County of Humboldt;

- Informing businesses and the media in advance of any project work that might impact business.

Implementation of such measures will minimize construction impacts on any particular location along the Route 101 corridor.

Alternative 7 would not cause any temporary impacts on access to local businesses or residential areas.

3.1.7 Visual / Aesthetics

This section is summarized from a report entitled, *Visual Impact Assessment – Eureka to Arcata Route 101 Corridor Improvement Project* and finalized in November 2006, and a report entitled *Visual Impact Assessment – Eureka-Arcata Corridor Combined Roadway Rehabilitation and Transportation Project*, prepared in October 2006. These reports are available for public review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government uses 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 California Environmental Quality Act (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." [Source: California Public Resources Code Section 21001(b).]

AFFECTED ENVIRONMENT

Moderate to high levels of visual quality exist along Route 101 between Eureka and Arcata, determined through an evaluation of the area's natural and developed features. Within the project limits, the highway corridor has a mostly pleasant appearance from natural characteristics of the landscape such as Humboldt Bay to the west of the highway and picturesque hills to the east which tend to dominate most views. The scenic appeal of these features is diminished in places by the visual presence and character of development where it exists along and near the highway. Such development includes industrial and commercial development, major overhead utilities, and numerous billboards. Trees and shrubs along the highway sometimes play an important role in screening or buffering views from the highway of roadside development, which detract from the rural character. In other places, however, such development is within full view from the highway. Route 101 in Humboldt County is eligible for designation, but has not been officially designated, as a State Scenic Highway.

The existing row of eucalyptus trees along the west side of Route 101 was planted approximately in 1926. During an extreme frigid period, most of the trees froze and suffered severe damage and were cut down in 1933. The trees standing today sprouted from the original stand. The lumber mill to the west was opened in 1953. At that time, some trees were removed to provide vehicular access to the mill. Many long-term local residents consider this visually prominent row of trees an important landmark. However, other local residents perceive eucalyptus trees as invasive, non-native trees.

Through analysis of specific viewpoints and examination of the visual experience of moving through the view corridors of the proposed project, it was found that the existing high visual quality is mostly due to the following:

- Views of Arcata Bay.
- Views of the rural character of the area; pasturelands, sloughs, and forested hillsides.

- Tree and shrub vegetation providing space defining qualities and screening of negative views.
- The distinctive landmark characteristics of the eucalyptus tree row. The height, length, volume, screening properties of negative views of the lumber mill, afternoon sun and shade patterns, and spatial definition.
- Public perception of trees and other vegetation along the corridor.
- Wildlife such as egrets in wetland areas adjacent to the highway.

Existing views from Route 101

Northbound Eureka to Arcata along Arcata Bay

The highway between Eureka and Arcata is separated by a wide vegetated median. The median ranges in width from 14-meters (47-feet) wide between the Eureka Slough Bridge and Airport Road, to 24-meters (80-feet) wide for the majority of the corridor. The median consists of grasses with wetlands in the wider or deeper portions. Approaching the State Route 255 (Samoa Boulevard) overcrossing, the median narrows to 6.7-meters (22-feet) wide, increasing to 17-meters (54-feet) wide at the 11th Street overcrossing, which is the north end of the project limit.

Motorists traveling northbound have initial views of light commercial/industrial businesses to the east. Views of the businesses are partially screened by cypress trees. The views of the commercial area are of short duration. Views north of and to the east beyond the commercial properties are of rural grasslands and forested hillsides. Views are open to the west and the traveler has a panoramic view of Arcata Bay. Views looking north and west are high quality. Views looking east are moderate quality.

As the traveler passes Airport Road, located 1.4 kilometer or 0.9 mile north of the Eureka Slough Bridge, the foreground views to the east are of a narrow water channel, pastureland, an airport, and forested hillsides beyond. The road curves to the left slightly and the traveler starts to notice the buildings to the right housed by Mid-City Motor World, a car dealership. On the western side of the highway, a long line of tall eucalyptus trees visually defines the highway as a corridor. Other tall trees on the east side of the highway accentuate the feeling of a corridor. By the time the traveler reaches the eucalyptus tree row, views of Humboldt Bay (Arcata Bay) are obstructed by the Simpson mill. The eucalyptus trees line the highway and are in a narrow space between the highway and a railroad. The eucalyptus tree row partially screens the Simpson Lumber Mill.

To the east and parallel to Route 101 roadway, a watercourse functions as a tidal slough. This water channel is prominent and continues northwards to Gannon Slough

Bridge. Egrets are a common sight among the cattails and water. Mowed grass and native shrubs grow between the highway and the water channel, providing a natural planted area. Mid-City Motor World, a car dealership, is adjacent to the water channel, with new cars parked near the top of the eastern bank. The dealership is prominent with its buildings, numerous new cars, and a merry-go-round. In this section, the few Monterey pines and eucalyptus trees on the eastern side of the highway accentuate the feeling of a corridor.

As the traveler continues past the entrance of Mid-City Motor World, the entrance to the Simpson Lumber Mill is on the left. There is a break in the line of eucalyptus trees for the entrance road to the lumber mill facility. The mill has the majority of its facilities to the south of this entrance. On the north side of the entrance, there is one dark brown office building. Just beyond the office building, Humboldt Bay curves back close to the railroad and highway. Views of the bay open up through the line of eucalyptus trees. The row of eucalyptus trees along the north side of the lumber mill was thinned out in the mid 1990's. This provided more open views of the bay while still continuing to create the sense of a corridor. The eucalyptus trees extend in a single row along the highway for two-kilometers or 1.25 miles. The eucalyptus trees are a dominant feature in the landscape due to their height of 20 to 25-meters (75 to 80-feet) and the row's length.

At the end of the eucalyptus tree row, views of Humboldt Bay from Route 101 open up completely. Monterey pine and cypress trees on the east side of the highway partially block views of pastureland with forested hills beyond.

The intersection of Indianola Cutoff has some commercial buildings on the southeast side. These are partially screened by large Monterey pines and cypress trees. The commercial buildings are set back off the highway. The large wooden backdrop to a former drive-in movie theater is visually prominent. Currently, it is a recreational vehicle sale lot--this feature detracts from the pastoral landscape.

1.1 kilometers or 0.7 miles north of Indianola Cutoff, the Route 101/Bracut intersection provides access to several commercial businesses on both sides of the highway. There are two to three businesses on each side of the highway, and they detract minimally from the natural landscape. Cypress and pine trees partially screen the low visual quality of the firewood business on the east. A row of small redwood trees screens the Caltrans Maintenance yard. The highway curves again slightly to the left. Here the view opens up to pastureland on the east seen through Monterey pines and wax myrtle and the bay on the west.

Bayside Cutoff is the intersection 0.8-kilometers or 0.5 miles to the north of Bracut. North of Bayside Cutoff, several Monterey pines grow in the median and the east side of the highway at Jacoby Creek. Further north on Route 101, the Monterey pines provide a vertical element and frame the views.

North of Bayside Cutoff, the highway makes a transition from a conventional highway to a freeway facility. Beginning north of Gannon Slough Bridge, thrie beam guardrail is in the median. The median continues to be 25-meters or 80-feet wide narrowing to seven-meters or 22-feet wide near the southbound South G Street onramp. The posted speed limit increases in this section from 50 to 65 miles per hour. Views are of pastureland to the east, with views of houses on the hills of Arcata to the north.

North of the Bayside Cutoff intersection, all three Build Alternatives include widening to the northbound Jacoby Creek and Gannon Slough bridges. The traveler often is unaware of passing over these two short bridges, as they are very short and have low railings. Gannon Slough is visible north of the bridge where it flows parallel to the freeway.

The traveler notices a change in the landscape as they approach the southern end of Arcata near the Route 101/255 interchange. The visually dominant overhead crossing of Route 255 over the freeway alerts the traveler that they are now in a more urban setting. This begins the second visual section of the project.

The northern section of the project is in an urban environment. Freeway on and off-ramps become closer together. The freeway is set lower than the city streets, with four streets and one pedestrian overcrossing overhead. The slopes of the freeway are attractively landscaped with grass and conifer trees.

The median begins to widen north of the State Route 255 (Samoa Boulevard) interchange. The median is landscaped with grass and shrubs. The median barrier that started north of Gannon Slough ends at the 14th Street off-ramp. Beyond the project limits, guardrail barriers are located at the median overcrossing columns at 14th Street, H Street, pedestrian path, Sunset Avenue, and Saint Luis Avenue. These are screened by shrubbery.

Existing views from the road - Southbound Arcata to Eureka along Arcata Bay

Driving south from the City of Arcata, the highway is no longer below the level of the city. South of the Route 101/255 interchange, the views open up to a flat rural landscape to the west. A narrow median with thrie beam barrier does not minimize the eye level views of pastureland to the east. The top of the barrier is below the driver's eye level. Forested hillsides provide a backdrop with strong character. Shortly thereafter, just south of the South G Street onramp, views of Arcata Bay open up and the shores of Humboldt Bay become an important feature.

The first vertical elements in the foreground landscape are pine trees in the median at Gannon Slough Bridge and Jacoby Creek Bridge. Surrounding views remain open.

Southward of Bayside Cutoff, the highway curves to the right. As the traveler approaches the Bracut intersection, the land juts out into the bay. Mostly native shrubbery is closer on both sides of the highway. On the east, small redwoods screen the Caltrans Maintenance Station and the topography and cypress trees screen the firewood business. A manufactured home business and the Bracut Lumber Yard come into view on the west. The view in this section is low to moderate.

After the Bracut Lumber Yard, the Bay comes back in near the highway and the visual quality of the views are high. The Humboldt Bay bridges crossing from Eureka to Samoa come into view in the background. In the middle ground, the edge of the bay is lined with a long row of tall eucalyptus trees, which become a dominant element in the landscape as the trees come into the foreground. Several large billboards between the highway and Humboldt Bay lower the visual quality of the bay views.

The eucalyptus trees at the north end are spaced such that views of the bay continue to be visible through the trees. Views of the bay through the trees run approximately 0.6-kilometer (0.4-mile). The trees in this location substantially block middle ground views of the lumber mill. After 0.6-kilometer (0.4-mile), buildings at the lumber mill behind the trees come into view.

There is a break in the eucalyptus trees at the Simpson Mill entrance. Several large building structures come in view for a short duration. The eucalyptus trees in the section south of the Simpson Mill entrance are closer together than those in the northern section, screening views of the multitude of structures and appurtenances of the lumberyard.

Even though there is a break in the eucalyptus trees at the mill entrance, from the ground, the row of eucalyptus trees appear continuous. The break in the trees is more noticeable when viewed from the distance or from the air.

The highway shoulder in the section of the eucalyptus trees is 2.4-meters or eight-feet wide. The highway shoulder appears narrow due to the guardrail adjacent to the edge of shoulder and the vertical element of the tall trunks of the eucalyptus trees just beyond. The height of the eucalyptus trees, in addition to the length of the row, produces the effect of a dominant living wall feature, which is highly memorable. Glimpses of sunlight, sky, and building structures can be seen behind the trees.

To the east, the traveler sees the cars, merry-go-round, and buildings of Mid-City Motor World car dealership. The quality of views of the pastoral landscape surrounding the car dealership and of the forested hills in the background is high, providing moderate to high visual quality in this area.

Views of Humboldt Bay open up at the south end of the eucalyptus tree row; however, views of the bay are partially blocked by wax myrtle shrubs and shore pines. To the east, views open up of the Murray Airport. The roadway curves to the right, with

views of the City of Eureka in the background. Along the curve to the east, cypress trees screen views of the commercial businesses. The wide grassy median adds to the visual quality of the area.

ENVIRONMENTAL CONSEQUENCES

Study Methods

The methods used to assess the visual impacts of the project are in accordance with applicable Federal Highway Administration (FHWA) guidelines as described in the publication *Visual Impact Assessment for Highway Projects*. The process involved examining the existing visual setting on a regional scale and determining how the project would change the appearance of the corridor. As part of this process, landscape character and levels of visual quality within the project area were determined for both pre- and post-project conditions. Visual quality was assessed through an examination of the landscape characteristics of vividness, intactness, and unity as defined in the Federal Highway Administration guidebook. Vividness is defined as the memorability of landscape components. Intactness refers to the visual integrity of the landscape and relative absence of visually encroaching elements. Unity refers to the compositional harmony of landscape components and coherence of features within a scene. As part of the field inventory of the existing visual setting, features of the landscape that might qualify as scenic resources were evaluated according to procedures outlined in the *Caltrans Standard Environmental Reference*. Such features may include, among other things, trees that represent unique specimens or those that exhibit outstanding visual characteristics due to their age, size, arrangement, or visual impression as a group. Lastly, visual impacts were assessed based on the anticipated changes in the landscape caused by the project and the likely response to those changes by the public. Specifically, the determination of visual effects was based on whether the project would

- Adversely affect views or vistas;
- Damage or remove scenic resources;
- Substantially alter landscape character or degrade visual quality;
- Create a substantial new source of light or glare.

These criteria are from Appendix G of the California Environmental Quality Act (CEQA) Guidelines.

The assessment of visual effects is supported by photo simulations that depict the appearance of a proposed new interchange at Indianola Cutoff and median barrier, as well as the tree removal.

The visual effects from this project would be both short and long term. Some effects are related to vegetation removal. There will be a temporary negative visual effect for the east side tree removal until replanted native tree and shrubs have grown and

developed some breadth and height. This should start occurring between three to five years, depending on the number, variety, and growth rate of trees replanted. In time, this visual effect will be eliminated.

Scenic Resource Determination

This project was reviewed for scenic resources. The scenic resources in this area are Humboldt Bay and the eucalyptus tree skyline. There will be no impacts to the scenic resources of Humboldt Bay. Views of Humboldt Bay will be improved by the removal of any eucalyptus trees along the northern section north of the lumber mill entrance. There will be a substantial scenic resource impact due to the removal of eucalyptus trees for the deceleration and acceleration lanes at the lumber mill. However, any eucalyptus trees removed at the north section of the eucalyptus tree row have a positive benefit of increasing views of Arcata Bay.

A local group, Keep Eureka Beautiful, have expressed their concern with the proposal to remove any eucalyptus trees along southbound Route 101.

Landscape Units

A landscape unit is a portion of the regional landscape and can be thought of as an outdoor room that exhibits a distinct visual character. A landscape unit often corresponds to a place or district that is commonly known among local viewers.

The project area is divided into four landscape units: Eureka Industrial Landscape Unit, Eucalyptus Row Landscape Unit, Humboldt (Arcata) Bay Landscape Unit, and the Arcata Landscape Unit.

Proposed views along the Eureka Industrial Landscape Unit After Any One of the Three Build Alternatives Is Constructed (except where noted)

Metal thrie beam guardrail is proposed for the Route 101 median from the north end of Eureka Slough Bridge to Airport Road. California native grasses will be replaced in the median section. The thrie beam will have a weed barrier underneath to improve mowing efforts. The northbound road alignment would move westward narrowing the median to accommodate the acceleration and deceleration lane improvement work at Cole Avenue. With the addition of the thrie beam in the grass median for 1.3-kilometer or 0.8-mile, the rural character decreases slightly. The overall views would remain the same.

For Alternative 3, the proposed deceleration lane for Airport Road would be replaced by a third lane. This will require the construction of a 1.2-meter (four-foot) high

retaining wall, which is below the road level. Some cypress trees on the east will be removed, eliminating screening of some of the commercial businesses. The grass median will decrease by 30%. The additional paving widths combined with the decrease in grass median will decrease the rural character.

Proposed views along the Eucalyptus Row Landscape Unit

Views along the eucalyptus tree row would change for viewers approaching Mid-City Motor World from the south. See Figures 3-14 through 3-20 for tree removal photo-simulations. To the west, travelers would see expanded views of the Simpson lumber mill complex. Because of the number of different building styles and miscellaneous structures, this view lacks unity and intactness. The southern portion of the remaining eucalyptus trees would still provide a sense of "a stand of trees" but the perception of a "corridor" that currently defines this landscape unit would be lost. The foreground views on the east side of the highway would have a flat open pasture quality with views of the hills in the background. The spatial quality would change from different "view rooms" which have been defined by periodic groupings of trees which frame views to the east to an open pastoral landscape.

The remaining eucalyptus trees at the northern section of the eucalyptus tree row landscape unit, north of the Simpson mill, would appear out of context with the area since the remaining tree row would consist of a narrow stand of trees "blocking" views of Arcata Bay. This is particularly so without the tall vertical element of trees on the east balancing the height of the eucalyptus on the bayside.

Proposed views along the Humboldt Bay Landscape Unit

Alternative 1 would close the existing median opening at Indianola Cutoff and extend the existing acceleration and deceleration lanes. The view would remain essentially unchanged.

Alternatives 2 and 3 include a proposed Route 101/Indianola Cutoff compact diamond interchange, which would be substantially different in appearance than the existing at-grade intersection. The on-ramps at the proposed Indianola Cutoff interchange would be approximately 800-meters long, and the off-ramps would be approximately 600-meters (1,968-feet) long. The Route 101 through lanes would be elevated approximately 7.6-meters (25-feet) above Indianola Cutoff and would have separate north and southbound bridges approximately 34-meters (112-feet) long with paved widths of 11.7-meters (38-feet). Roadway lighting at exit and entrance ramps as well as the intersections of the ramps with Indianola Cutoff would be installed.

If the interchange were constructed, affected viewers would include:

- Motorists on Route 101 as they approach and pass the new interchange from either direction;
- Westbound motorists on Indianola Cutoff as they approach the new interchange;
- A few local residents within the vicinity of Indianola Cutoff; and
- Views from Humboldt Bay looking east toward the shore at the new interchange.

The following Figures 3-7 through 13 represent visual simulations of the proposed interchange configuration as it would appear from different perspectives.

Figure 3-7
Proposed Interchange Design Configuration

Figure 3-8A
Aerial Photograph of existing Route 101/Indianola intersection facing east

Figure 3-8B
Photo-simulation of proposed interchange at Indianola Cutoff

Figure 3-9A
Photograph of existing
Route 101/Indianola Cutoff Intersection facing north

Figure 3-9B
Photo-simulation of proposed
Route 101/Indianola Cutoff Interchange facing north

Figure 3-10A
Photograph of existing southbound
Route 101 exit ramp to Indianola Cutoff

Figure 3-10B
Photo-simulation of proposed interchange
at Indianola Cutoff facing south along Route 101

Figure 3-11A
Existing Photograph of Route 101
facing towards Humboldt Bay from Indianola Cutoff

Figure 3-11B
Visual Simulation of Proposed Interchange Seen from Indianola Cutoff

Figure 3-12A
Photograph of existing Indianola Cutoff from Route 101

Figure 3-12B

Photo-simulation of proposed interchange as viewed from northbound Route 101

Figure 3-13A
Oblique Photograph of existing Indianola/Route 101 intersection

Figure 3-13B
Oblique view photo-simulation of proposed Route 101/Indianola Interchange

Northbound views from Route 101 of Humboldt Bay and the surrounding landscape would be minimally blocked or disrupted by the new interchange. For persons traveling west on Indianola Cutoff and some local residents living adjacent to Indianola Cutoff and near Route 101, the proposed interchange would disrupt views of Humboldt Bay to some extent. For local residents, the view of Humboldt Bay would be only partially blocked by the proposed interchange, but the effect would be permanent. Because of the lower traffic volumes on Indianola Cutoff compared with Route 101 and because the view from residences would be only partially blocked, the impact is not considered severe. There would be no feasible measures that would mitigate the loss of views of Humboldt Bay caused by the new interchange. However, the appearance of the interchange could be enhanced by landscaping. The Caltrans landscape architect will develop a landscape plan for the new interchange during final design of the project. The goal of the plan should be to beautify the interchange without causing additional blockage of views of Arcata Bay.

The removal of the eucalyptus trees near the proposed interchange would result in a minor effect to visual resources. These trees would be removed at the northern terminus of the Eucalyptus Row Unit and would improve views of Humboldt Bay (Arcata Bay). This activity would not affect the intactness or unity of this visual resource unit. Therefore, the quality of this resource would not be affected by this action. In addition, in comparison to the change in the visual resources from this interchange, this change to the visual resource unit would not be noticeable. Some people may consider the removal of these trees a beneficial effect to visual quality since it would open up views to the bay. Due to the minor size of this impact, no landscaping or replanting activities would be necessary to restore the visual quality of this visual resource unit.

Proposed bridge construction on three bridges involve widening the existing Jacoby Creek and Gannon Slough bridges to the right and replacing the southbound Jacoby Creek Bridge. Proposed bridge construction includes see-through bridge railing, which will enhance views. Between Indianola Cutoff and Bayside Cutoff, proposed tree removal would increase the amount of open pastoral views to the east and provide less variation in the landscape.

See Figures 3-14 through 3-21 for photographs of the existing and proposed views of trees.

Figure 3-14A
Photograph of existing Eucalyptus tree row at Route 101 and Simpson Mill driveway facing south

Figure 3-14B
Photo-simulation showing partial removal of Eucalyptus tree row and proposed acceleration ramp extension

Figure 3-15A
Photograph of existing trees at Route 101 near Mid-City Motor World driveway facing north

Figure 3-15B
Photo-simulation of proposed tree removal on both sides of Route 101

Figure 3-16A
Photograph of existing trees at
Route 101 facing west towards the Simpson Mill

Figure 3-16B
Photo-simulation of proposed tree removal

Figure 3-17A
Photograph of existing trees at
Route 101 facing north near the Simpson Mill median opening

Figure 3-17B
Photo-simulation of proposed tree removal

Figure 3-18A
Photograph of existing trees at
Route 101 facing north near Murray Field Airport

Figure 3-18B
Photo-simulation of proposed tree removal

Figure 3-19A
Photograph of existing trees at
Route 101 near Mid-City Motor World facing north

Figure 3-19B
Photo-simulation of proposed tree removal

Proposed views along the northern section of Humboldt Bay Landscape Unit and Arcata Landscape Unit

Beginning at South Street G Street northward, a median barrier is proposed. At South G Street, the median width is 7.3-meters (24-feet) for approximately 2.6-kilometers (1.6 miles). The median remains at a 7.3-meters (24-feet) width until 200-meters or 650-feet north of the 7th Street overcrossing, at which point, the final 160-meters (525-feet) of median widens up to 16.5-meters (54-feet) of pavement and barrier. The concrete median barrier will be a solid vertical element. Asphalt paving for the median barrier increases the sense of the width of the freeway.

Summary of Project Potential Visual Effects

Trees along the Eureka–Arcata highway corridor provide spatial quality created by the height, volume, spacing and repetitive patterns. The removal of approximately 50% of the trees in the corridor will change the visual character substantially.

The introduction of highway elements such as median barriers and increased road pavement for lengthened acceleration and deceleration lanes will change the rural character in those sections of the corridor to a more urban setting. The long duration views of these elements result in low and moderate visual impacts.

Bridge rail for Gannon Slough and Jacoby Creek bridges should be consistent with the barrier railing for the overcrossing at the interchange.

Key view #1 Install double thrie beam median barrier between Eureka Slough Bridge and Airport Road
Low visual impact; see Figure 3-21.

Key view #2 Realign and signalize Route 101/Airport Road intersection - Alternative 3: retaining wall, double thrie beam in median, three lanes of northbound travel, stoplight
The retaining wall will not be visible from the highway. From Jacobs Avenue, it is a short wall on the far side of a drainage ditch. Visibility would be minimal and aesthetic treatment specifically for the retaining wall would draw attention to the retaining wall, which is not desirable.

Moderate visual impact lessened to low impact with replanting.

Key view #3 Tree and shrub removal on east side of Route 101
Adverse visual impact lessened to moderate impact with mitigation planting.

Key view #4 Widen Northbound Jacoby Creek and Gannon Slough bridges
Low visual impact.

Key view #5 Install concrete median barrier in Arcata
The thrie beam guardrail would be replaced by a five to six foot wide paved median, concrete barrier, with grass strips on both sides of the paved area. Moderate visual impact; see Figure 3-22.

Key view #6 Install metal beam guardrail at billboards
Low visual impact.

Key view #7 Replace Southbound Jacoby Creek Bridge
Low visual impact.

See Figure 3-20 for photo-simulation of the proposed bridge rail for the Jacoby Creek Bridges, northbound Gannon Slough Bridge, and the proposed Indianola Interchange.

Figure 3-20
Visual Simulation of Proposed Type 80 Bridge Rail

Figure 3-21A
Existing Route 101 median north of Eureka Slough Bridge

Figure 3-21B
Photo-simulation of proposed metal beam guard rail on Route 101 median north of Eureka Slough Bridge

Figure 3-22 A
Existing median barrier south of Route 101/255 interchange in Arcata

Figure 3-22 B
Photo-simulation of proposed concrete median barrier

Key view #8 Partial removal of Eucalyptus tree row
Adverse visual impact; lessened to high impact with tree planting on Simpson mill property

Key view #9 Indianola Cutoff interchange
The proposed Indianola Cutoff interchange would be substantially different in appearance than the existing intersection, and would have moderate-high visual impact

Affected viewers would include:

- Motorists on Route 101 as they approach and pass the new interchange from either direction;
- Westbound motorists on Indianola Cutoff as they approach the new interchange;
- A few local residents within the vicinity of Indianola Cutoff; and
- Views from Humboldt Bay looking east toward the shore at the new interchange.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans and the FHWA mandate that a qualitative/aesthetic approach should be taken to mitigate for visual quality loss in the project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses the actual cumulative loss of visual quality that will occur in the project view shed when the project is implemented. It also constitutes mitigation that can more readily generate public acceptance of the project.

Mitigation for tree removal impacts discussed in the previous section will consist of implementing visual mitigation designed with concurrence of the District Landscape Architect. Since visual, biological, traffic safety, and landscape maintenance issues overlap, visual mitigation for tree removal will be part of an overall vegetation management plan for this project. The goal of this management plan is to achieve an overall net gain for visual and biological resources while enhancing or at least maintaining traffic safety. The plan includes balancing the following related concerns/issues:

- As noted in the previous section, many trees within the clear recovery zone are proposed to be removed. However, a team composed of traffic safety engineers and landscape architects will work together to preserve tree groupings and individual trees that possess high visual value. Tree preservation considerations include studying locations of past vehicle

collisions with trees and to consider installing guardrail to protect trees of high visual value.

- Large, heavy Eucalyptus tree limbs dropping on the highway lanes pose a safety concern. Tree litter such as the large, hard seeds falling from the Eucalyptus trees also pose a hazard for bicyclists. In addition, extensive traffic control is required to prune the Eucalyptus trees. Consequently, traffic safety could be enhanced as well as maintenance costs reduced if there were fewer Eucalyptus trees.

- The health and life expectancy of the Eucalyptus trees are a concern. In addition, many of the mature non-native trees adjacent to Route 101 have toppled during recent winter storm events.

- The Eucalyptus trees along Route 101 are *Eucalyptus globulus,* which is listed A-1 on the California Exotic Pest Plant Council. Executive Order 13112 requires federal agencies to combat the introduction or spread of invasive species in the United States.

- Habitat value of trees on both sides of Route 101 for birds in relation to the wildlife refuges on both sides of Route 101 need to be considered.

- There is a need to balance the issues of opening Humboldt Bay views from Route 101 by removing Eucalyptus trees on the west side of the highway and enhancing highway safety with individuals and organizations that favor preserving the tree row to the full extent possible.

After coordinating with resource agencies and circulating this Draft Environmental Impact Report/Statement for public review and comment, the comprehensive vegetation management plan for this project will be finalized.

The following visual mitigation requirements, included in the comprehensive vegetation management plan, are arranged by project feature and include design options in order of effectiveness. Note that planting quantities and type will be determined by the space available and located appropriately to enhance views and screen negative views. The Highway Planting Plan will have the location and size container for each plant. Plant material will be planted from plant container sizes typical for Highway Planting projects with a plant establishment period. With the implementation of the stated mitigation methods, the visual impacts of this project would be reduced.

Key view #1 Double thrie beam median barrier between Eureka Slough Bridge and Airport Road

Provide low growing California native grasses in median areas with double thrie beam barrier.

Key view #2 Airport Road - Alternative 3: retaining wall, double thrie beam in median, three northbound lanes, and traffic signal

Mitigate negative views opened up by tree removal by replanting with native shrubs and trees below the 1.2-meter (four-foot) high retaining wall. Plantings will also soften views of the retaining wall from Jacobs Avenue.

Key view #3 Trees and shrubs on east side of Route 101

No shrubs were found to be located within the 4.6-meter (15-foot) setback. Existing shrubs will need to be evaluated on an individual basis whether there needs to be any removal. Planting new shrubs at or beyond the required setback will mitigate any shrub removal.

Caltrans landscape architects and engineers will work cooperatively to identify the removal of individual trees or groups of trees in order to preserve the spatial quality that the trees provide along the corridor.

Airport Road to Indianola Cutoff

- Highway design exceptions to retain specific trees with visual value, which are close to the required nine-meter (thirty-foot) setback, will be pursued.
- If design exception is not approved, other measures to preserve trees will be explored, including installing metal beam guardrail at four tree groupings located at post miles 81.20, 81.93/81.96, 82.05/82.09, and 82.11/82.12.
- As mitigation for tree removal, native tree species from 5-15 gallon size containers will be replanted at, or beyond setback.
- At Mid-City Motor World extend/relocate guardrail to protect trees on south and north side of entrance.

Indianola Cutoff to Bracut

- New fill slopes at deceleration lane at the Bracut intersection on the east side of Route 101 will be replanted with native trees from five to fifteen gallon size containers and shrubs to be planted from one gallon size or similar containers.

- Along the acceleration lane work at the Caltrans Bracut Maintenance Yard, highway design exceptions to retain specific trees, which are close to the required nine-meter (thirty-foot) setback, will be investigated.

- To mitigate for tree removal at Caltrans Maintenance yard, plant with native shrub species at or beyond the 4.8-meter (15-foot) setback.

Bayside Cutoff northbound onramp

- Remaining trees at northbound onramp to be protected during adjacent tree removal. Any newly exposed interior tree limbs that show no needle growth shall be reviewed by District Landscape Architect and Certified Tree Arborist to determine if trimming is necessary.

- Replant with native *Pinus muricata* (Bishop pine) in 5-15 gallon size containers.

Key view #4 Widen Northbound Jacoby Creek and Gannon Slough bridges

Jacoby Creek Bridge. If tree removal is required due to bridge construction, replace trees with *Pinus muricata* (Bishop pine) in 5-15 gallon size containers.

South G Street southbound onramp. In this location trees are beyond setback requirements, therefore no removal is required. There are some trees shown on the aerial photographs in Appendix A that blew down during the winter 2005-6 storms.

Key view #5 Concrete median barrier in Arcata

The proposed northern section of concrete median barrier within Arcata can be visually enhanced by adding color or texture and using the lowest height barrier to retain views of the other side of the highway.

Key view #6 - Metal beam guardrail at billboards

No visual mitigation measures are required.

Key view #7 Southbound Jacoby Creek Bridge

No visual mitigation measures are required.

Key view #8 Row of Eucalyptus trees

Tree take is planned to be 50% of the entire row (or about 300 trees). Alternatives 2 and 3 would remove an additional 25 trees to construct the interchange. The row of eucalyptus trees acts as a "living wall" by defining the corridor along Route 101. The loss of this local scenic resource cannot be compensated without acquiring additional right-of-way from the mill to provide clearance for replacement planting. The continuous tall, linear "wall" that the trees provide cannot be reproduced by other varieties of plant material. In addition, because of planting area constraints, shrubs also cannot be planted. Therefore, only grasses and wildflowers can be planted in this location within the existing highway right-of-way.

It should be noted that realigning the Route 101 roadway to the median to avoid the eucalyptus tree row was considered, but ultimately dropped from further consideration. There are specific geometric alignment requirements for acceleration and deceleration lanes and ramps that queue drivers to make a deliberate choice to leave or enter the highway. The mainline highway should avoid acceleration, deceleration or ramp maneuvers that could cause vehicles to unintentionally exit the highway. Route 101 could be realigned toward the median to accommodate acceleration and deceleration lanes. However, the improvements would need to be accomplished over a substantially greater longitudinal distance to conform to highway alignment standards, (not acceleration/deceleration lane standards). Mainline highway improvements would need to be extended even further to create a uniform alignment from which to provide the more abrupt acceleration and deceleration lane improvements. Extending these improvements by realigning the Route 101 lanes would approximately double the impacts to wetlands within the median for the acceleration and deceleration lane improvements.

Key view #9 Route 101/Indianola Interchange (Alternatives 2 and 3 only)

- Apply erosion control to all disturbed soils using California native grass species.
- Plant native shrubs and low growing trees at off ramps on east side of Route 101.
- Plant native shrubs at off ramps on west side of Route 101.
- Caltrans landscape architects and biologists will prepare a maintenance program to ensure plant establishment and long-term success.

After measures to minimize harm are implemented, visual effects would still be adverse and substantial—at least in the short term (less than three to five years after

construction). All three Build Alternatives would remove a majority of the trees along Route 101 between Eureka and Arcata altering the rural visual quality defined by mature trees on both sides of Route 101. Aesthetic value and perception are subjective, and reactions to removing eucalyptus trees, which have stood for several decades as a prominent visual feature that visually screen the Simpson Mill, will vary greatly. Although trees can be replanted on the east side of Route 101, replanting on the west side would not be possible without planting outside of the existing right-of-way. In addition, a new interchange for Alternatives 2 and 3 would further alter the rural, open space setting of the existing intersection to a more urban setting. On the other hand, thinning the eucalyptus tree row north of the Simpson Mill is expected to have a positive effect by opening views of Arcata Bay. In the long term, beyond three to five years, if trees were replanted at key locations, the quality of the pre-construction visual setting would be expected to slowly re-establish itself.

Other project features, such as new median barrier, would not individually result in a substantial visual effect. However, there is moderate cumulative loss in the visual character for the entire corridor due to the change in the character of the highway from rural landscape to urban landscape. Indicators of cumulative loss are the loss of trees, the increase in roadway surfaces, the addition of a center median barrier, and the addition of a conventional freeway interchange. The expressway becomes a more dominant feature in contrast to the existing, rural highway quality. Adding to the cumulative loss is the perception of the landscape while driving at higher speeds.

3.1.8 Cultural Resources

This section describes the project's potential effects, or impacts, on cultural resources, how those effects were determined, and whether and how impacts can be avoided or lessened. This section is divided by cultural resource type; archaeological resources are discussed first, followed by architectural resources.

This section is summarized from a report entitled "Historic Property Survey Report for the Proposed Eureka-Arcata Corridor Projects" finalized September 2006. Not all information about cultural resources can be fully disclosed to the public. The location of an archaeological site is exempt from disclosure to the public by law in order to protect sites. Site locations can be disclosed to archaeologists who sign confidentiality agreements with the repositories which house the records (California Historical Resources Information Centers). Please call Tim Keefe at 707-441-2022 for more information about reviewing any of the cultural resource documents.

REGULATORY SETTING

"Cultural resources" as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, (NHPA) 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. 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. The PA governs the implementation of the Federal-aid Highway Program in California (36 CFR 800.14(b)).

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. See Appendix B for specific information regarding Section 4(f).

Historical resources are considered under the California Environmental Quality Act (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 National Register of Historic Places listing criteria. It further specifically requires the Department to inventory State-owned structures in its rights-of-way.

AFFECTED ENVIRONMENT

In order to evaluate historic architectural and archaeological resources, an Area of Potential Effects (APE) map was prepared to identify all areas that have the potential to be either directly or indirectly affected by the project's activities. The APE map also includes all permanent and temporary easements, areas that are perceived to have the potential to be used for construction staging/storage, as well as all evaluated archaeological and architectural properties.

The following cultural resources studies were completed for this project:

- Historic Resources Evaluation Report: Eureka to Arcata Route 101 Corridor Improvement Project, Humboldt County, CA; Author: JRP Historical Consulting Services.

- Supplemental Historic Resources Evaluation Report: Eureka to Arcata Route 101 Corridor Improvement Project, Humboldt County, California; Author: Judy Tordoff, Principal Investigator-Historic Archaeology, Kimberly Wooten, Co-Principal Investigator-Historical Archaeology, and Janice Calpo, Principal Architectural Historian.

- Archaeological Survey Report: Eureka to Arcata Route 101 Corridor Project, Humboldt County, California; Author: Sally Salzman Morgan, Brian Hatoff, and Sean David Dexter, URS Corporation.

- Supplemental Archaeological Survey Report for the Eureka-Arcata Corridor Projects, State Route 101, Humboldt County, California. Author: Timothy Keefe, Co-Principal Investigator - Prehistoric Archaeology.

Pre-Historic and Historic Archaeology

Archaeological surveys were conducted between December 2 through December 6, 2002 and on August 2, 2005. The Archaeological Area of Potential Effects (APE) linearly extends along Route 101 from just north of the town of Eureka at the Eureka Slough to the intersection of Route 101 and 11th Street in Arcata. The width of the Archaeological APE generally encompasses the existing State right-of-way, with widened areas that include all potential construction locations, including those needing construction easements, the potential new intersection area at Indianola Cutoff, and the potential new intersection area at Airport Road. The area that was surveyed and the resources addressed were primarily located within the existing State right-of-way. The area that was surveyed extends from just north of the town of Eureka at the Eureka Slough, north for approximately six miles to West End Road in the City of Arcata. Complete intensive archaeological surveys extended from the paved highway margin to the outer edge of the highway rights-of-way on both sides of Route 101.

A 1930s era dumpsite that is located within the project's Archaeological APE has been determined eligible for the purposes of this project. A portion of this dumpsite is located within the area of direct impact for the project, however this portion was evaluated as not eligible for the National Register of Historic Places. The location of an archaeological site is exempt from disclosure to the public by law in order to protect sites from looters. In accordance with 16 USC 470w-3(a), 36 CFR 800.11(c), site locations can be disclosed to cultural resource professionals who sign confidentiality agreements with the repositories that house the records (California Historical Resources Information Centers).

Historic Architecture

Consistent with Caltrans policies and general cultural resource practices, the architectural APE includes the area directly impacted by construction as well as taking into consideration the potential for indirect effects. Where the existing highway right-of -way is extensive and proposed work is minimal, the architectural APE conforms to the existing right of way. Only those resources located within the architectural APE were included in the survey.

Once the APE was defined, a reconnaissance survey was conducted of the area to account in the field for all the buildings, structures, and objects found within the APE. This field reconnaissance helped to determine which buildings appeared to be more than 45 years of age and would therefore be studied for this project. Additional background research was done through First American Real Estate Solutions commercial database, review of historic and current USGS topographic maps, and other documents to confirm dates of construction. While the Secretary of Interior sets the standard guideline for review of potential National Register eligible buildings, properties that are 50 years of age or older, this age limit has been extended to include resources constructed in 1960 or before to account for lead-time between preparation of environmental documentation and actual project construction.

The investigation of historic-era properties included research regarding their historical context, as well as resource-specific research conducted in both archival and published records. Research for this project was conducted at the California State Library, the Humboldt County Historical Society, the Humboldt Room of Humboldt State University, the California Department of Transportation Library (Headquarters in Sacramento), Caltrans District 1 Maps and Plans Office, the Earth Sciences and Map Library at University of California, Berkeley, and the Shields Library at University of California Davis. The project team also undertook personal interviews.

A portion of Murray Field Airport has been determined to meet National Register criterion C, at the local level of significance, for the architecture of the original 1930s hangar that is central to the airport and its history. This structure also retains a high degree of integrity. The boundaries of this historic property extend to the immediate tarmac surrounding the hangar, but not to the extent of the entire property as runway configurations have changed dramatically over time and newer structures have been added to other areas of the airport.

ENVIRONMENTAL CONSEQUENCES

Under the authority of FHWA, Caltrans has determined a Finding of No Adverse Effect with Standard Conditions, is appropriate for this project undertaking according to Section 106 PA Stipulation X.B(2) and 36 CFR 800.5(b).

The State Office of Historic Preservation sent a letter dated 11-29-06 of concurrence regarding all evaluated properties, except one, in terms of eligibility for the National Register of Historic Places (NRHP). The letter included a concurrence with the Caltrans determination that 17 properties evaluated are not NRHP eligible. The letter did not concur with Caltrans' NRHP eligibility determination that a portion of the Murray Field Airport is eligible, but recommended it be treated as NRHP eligible. In addition, the letter concurred with the Finding of No Adverse Effect in terms of the project's effect on the Murray Field Airport. A copy of the State Office of Historic Preservation letter is included in Chapter 5.

Section 4(f) *De Minimis* Use

Under 49 USC 303(d)[%], FHWA may determine, if certain conditions are met, that a project will have only a *de minimis* impact on a property protected by Section 4(f) of the U.S. Department of Transportation Act of 1966. With respect to historic sites, FHWA may make such a finding only if it is determined that the project will have no adverse effect on the site (or that there will be no historic properties affected by the project) and the SHPO concurs in the no adverse effect finding. If this is the case, the requirements of Section 4(f) are considered satisfied (49 USC 303(d)(1)(A)).

Construction within Murray Field Airport west of Route 101 near Airport Road, which does not include the NRHP eligible portion of the airport, would likely require an encroachment permit from the County of Humboldt. Although unlikely, Alternative 3 may require right-of-way acquisition from the Murray Field Airport: right-of-way acquisition would not change the SHPO finding. As mentioned above, on November 29, 2006, the SHPO concurred in FHWA's finding of no adverse effect to the airport property. Accordingly, FHWA has preliminarily determined that if Alternative 3 were selected it would result in a *de minimis* impact to the Murray Field Airport property for purposes of Section 4(f).

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

All project alternatives, except Alternative 3, will avoid cultural resources. As stated previously, right-of-way acquisition from the Murray Field Airport does not include the National Register of Historic Places eligible portion of the airport.

The portion of the archaeological site located near, but outside of the Caltrans right-of-way, will be identified as an Environmentally Sensitive Area on project plans. High visibility mesh fencing will be placed along the border of the site at the Caltrans right-of-way prior to construction activities, and construction personnel will be directed to keep all equipment and activities outside of the fenced area.

Although no intact archaeological sites are known to occur entirely within the project Archaeological APE, the Table Bluff Wiyot Tribe deems portions of the project sensitive for potential cultural resources. See Chapter 5 for more information on Tribal Coordination. Through consultation between Caltrans and the Table Bluff Wiyot Tribe, it has been agreed to monitor these locations in the event that items of significance to the Tribe are unearthed during earthmoving activities. If cultural materials are discovered during construction, all earth-moving activity within and

[**] Traffic volume counts were taken by Whitlock & Weinberger Transportation, Inc. in June, 2005. Percent change of mainline volumes from the micro simulation model and a growth rate of 10% in 20 years were applied to these counts for evaluation of the different alternatives.

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 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 Timothy Keefe, Caltrans Archaeologist, at 707-441-2022 so that he may work with the MLD on the respectful treatment and disposition of the remains.

No other measures to minimize harm or mitigation are necessary, since there are no anticipated temporary or permanent potential impacts to cultural resources.

3.2 Physical Environment

3.2.1 Hydrology and Floodplain

This section is summarized from a floodplain report finalized in November 2003. This report is available for public review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

AFFECTED ENVIRONMENT

Route 101 between Eureka and Arcata has a fairly straight and flat alignment and is adjacent to the Northwestern Pacific Railroad (NWPRR). The railroad track embankment is adjacent to the Arcata Bay and is generally the same elevation as Route 101, thereby acting as a levee between Humboldt Bay (includes Arcata Bay) and the surrounding land. The adjacent land area is largely pasture with some publicly owned wildlife refuges and pockets of commercial, industrial, and housing uses. North of the highway 101/255 interchange in Arcata is dominated by urban development.

South of the highway 101/255 interchange in Arcata, the area historically was a diverse system of tidal and freshwater sloughs with a variety of meandering streams and estuaries that drained to Humboldt Bay at various locations. Because of the high groundwater and saturated soil conditions, the land is mainly used for pastureland. Development and land uses within this area includes an airport, a campground, automobile dealerships, building supply stores, sporadic agricultural support structures, a mobile home park, and a variety of other businesses. There are also wildlife refuges on both sides of Route 101.

The natural and beneficial floodplain values within the project area include wetlands, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, pastureland, natural moderation of floods, and water quality maintenance. These values, with the exception of the flood moderation, are discussed in detail in the Water Quality, Wetlands, Vegetation, Wildlife, Visual, and Community Impact sections of this chapter.

In total, approximately 207 square kilometers (80 square miles) of watershed drain into the bay through this segment of highway. Freshwater Creek, Jacoby Creek, and Gannon Slough tributaries are the larger contributors. Eureka Slough and Brainard's Slough, which Rocky Gulch and Washington Gulch flow into, also contribute runoff and tidal inflow through this segment of highway.

For purposes of simplifying the necessary analysis, the floodplain areas and their contributing watersheds were grouped based upon natural drainage boundaries. A natural boundary exists near the Bracut intersection. The area around Bracut was originally called Brainard's Ridge before it was excavated in 1918 and again in 1955, deeming the term Brainard's Cut (Bracut). The elevation of Bracut and the remaining ridgeline are higher than the adjacent land to the north and south, thereby creating a distinct drainage separation. For this reason, floodplain areas and contributing watersheds were divided into the northern watershed and the southern watershed.

The southern watershed major tributaries include Freshwater Creek, Ryan Creek, and several smaller unnamed tributaries. All waters that enter this watershed drain to Humboldt Bay through the Eureka Slough. A large portion of the water within this

section drains to the Eureka Slough via an approximately eleven-meter wide, two-meter deep, 4,785-meter long (35-feet wide, six-feet deep, 15,700-feet long) channel. The channel originates immediately south of Bracut and flows adjacent to the highway beneath Indianola Cutoff, via a culvert, approximately 45-meters (150-feet) east of the highway. It then flows south, adjacent to the highway, then east along Airport Boulevard for approximately 150-meters (500-feet) before the channel discharges directly into Eureka Slough through two culverts. The two culverts are equipped with tide gates. These two tide gates keep tidal waters from inundating the southern watershed floodplain. In this section of highway, there are continuous culverts that flow underneath the highway and drain directly into the bay. The Route 101 roadway median runoff in this section drains east through several pipes that outlet into the channel. Simpson's Brainard Sawmill, which lies west of Route 101, drains under the highway into the 4,785-meter (15,700-feet) long channel.

The northern watershed major tributaries include Rocky Gulch, Washington Gulch, Jacoby Creek, Old Jacoby Creek, and drainage that originates from the City of Arcata and neighboring pasturelands. Washington and Rocky Gulch flow into Brainard's Slough, which controls all inflow/outflow using three tide gates at various locations. Old Jacoby Creek flows under the highway and is controlled by a tide gate. Jacoby Creek and Gannon Slough waters flow under highway bridges to the bay. Gannon Slough has tide gates controlling waters that enter the slough from the city of Arcata and surrounding pasturelands. Jacoby Creek and Washington Gulch are the only tributaries in the northern watershed that drain to the bay with no tide gates to control tidal influences.

The highway median throughout the Route 101 corridor between Eureka and Arcata is generally depressed (below the level of the road). The median is typically 24-meters (80-feet) wide and has a variable depth. Some sections of the median are below high tide elevations of the adjacent Arcata Bay, and tidal water can accumulate above the surface of the median.

The Route 101 corridor between Eureka and Arcata initially consisted of a two-lane highway built in 1918 (presently the southbound lanes). This section was partially reconstructed and expanded into four lanes between 1954 and 1956. During this construction, the drainage systems were upgraded to facilitate outflow from the watersheds and to reduce tidal influences.

In reviewing historic files in the Caltrans District 01 Hydraulics Office, it was determined that there has been only one occurrence when the highway was overtopped by floodwaters. Furthermore, it appears that flooding of adjacent lands has become less frequent since the 1954-1956 construction—presumably because of the installation/upgrade of tide gates and an increased highway grade elevation.

Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) indicate portions of Route 101, adjacent lands lie within both Zone A, and Zone C designated Floodplains Zone A is defined as "*Areas of 100-year flood; Base Flood Elevations and flood hazard factors not determined."* Zone C is defined as "*Areas of Minimal Flooding-Outside of the 100-year Base Floodplain Area*." The FEMA Flood Insurance Rate Maps showing the project limits are included in the 2003 floodplain report, which is available for review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to review the report. FEMA maps showing floodplains in relation to Route 101 can also be viewed at http://msc.fema.gov/webapp/

On Route 101, from the Eureka Slough Bridge to approximately 305-meters (1,000 feet) south of Indianola Cutoff, and for approximately 91-meters (300-feet) south to 335-meters (1,100 feet) north of the Bracut intersection, Route 101 is outside the 100-year Floodplain. With the exception of Simpson Mill, and the area adjacent to Jacobs Avenue, which is protected from the Eureka Slough via a levee, all remaining highway and adjacent low-lying areas are designated as Zone A.

The California State Reclamation Board defines a designated floodway to mean either: (1) the channel of the stream and that portion of the adjoining floodplain reasonably required to provide passage of a base flood or (2) the floodway between existing levees as adopted by the California State Board or the Legislature. FEMA Floodway Maps for the project study area do not include any designated floodways within the project limits. Jacoby Creek, upstream from Old Arcata Road, is designated as a Floodway. However, downstream of the Old Arcata Road Bridge is listed as a Zone A Floodplain. No other floodways near the project have been established.

The floodplain areas for the southern watershed (Freshwater Creek/Eureka Slough) were calculated to be approximately 1,279 hectares (3,161 acres). The floodplain areas for the northern watershed (Jacoby Creek/Gannon Slough) were calculated to be approximately 371 hectares (916 acres).

Hydrology

Hydrology is the scientific study of the properties, distribution, and circulation of the water of the earth and the atmosphere in all of its forms. Hydrology also includes the study of the amount and flow of groundwater. Understanding the hydrologic setting of the project area is critical to predicting the flooding potential.

The project area is characterized by a cool maritime climate with a seasonal distribution of precipitation. The average annual rainfall for this area is approximately 100-cm (forty-inches). The upper watershed consists of mountainous terrain, with slope grades steeper than 1:1 (ratio of horizontal to vertical). There is a high amount of vegetative cover, with minimal development, and the soils generally

possess good water permeability properties. A substantial amount of the watershed has been logged in past years.

The lower watershed is less steep with substantial vegetative cover, and less water permeable soils than the upper watershed. There is also more development on the lower watershed, but it is much less dense than urban development. Because of high groundwater elevations, and the often-saturated soils, infiltration of runoff is considered low during the winter months.

The drainage systems within the Route 101 corridor are an intricate arrangement of levees, channels, and sloughs, all under tidal influence. During high tide events, except for on Jacoby Creek and Washington Gulch, all tide gates close and runoff entering the Route 101 corridor begins to be stored within the floodplain. Once the tidal elevations recede and the tide gates open, the stored water drains to the bay. This is the daily routine for all drainage that enters the Route 101 corridor. High water elevations are a direct function of precipitation duration and quantities, tidal elevations, and outflow capacity of the existing drainage systems.

During Humboldt Bay high tide events, water elevations on Jacoby Creek and Washington Gulch rise at and near the outlet to the bay. Depending upon the tide elevation and the flow rate of the creeks, the banks can be breached. Once the banks are breached, the surrounding pasturelands are flooded. These floodwaters are contained within the floodplain until they either infiltrate or exit through Old Jacoby Creek or Gannon Slough.

ENVIRONMENTAL CONSEQUENCES

For Alternatives 1 and 2, the proposed interchange at Indianola Cutoff would include new drainage facilities to direct on-site runoff. All new roadway facilities would operate under gravity flow and would connect to existing drainage systems. All existing drainage patterns would be perpetuated.

None of the proposed drainage work results in a measurable decrease of floodwater storage capacity of the floodplain or the outflow (drainage) efficiency of the floodplain. The minimal loss of permeable surfaces due to the acceleration and deceleration lane improvements is considered negligible.

To calculate the encroachment and possible impacts that this project may have on the Floodplain, the proposed areas of proposed fill or roadway were compared to the Federal Emergency Management Agency (FEMA) designated 100-year Floodplain areas.

Extending the existing southbound acceleration and deceleration lanes would require enlarging the roadway fill embankments at both Simpson Sawmill and Bracut Industrial Park. At these locations, the embankments would be outside the Zone A

Floodplain and consequently are considered to have no impact on drainage patterns or floodplain water surface elevations. The proposed extension of the existing northbound acceleration and deceleration lanes for Cole Avenue, Mid-City Motor World, and Bracut are also outside the Zone A Floodplain. Indianola Cutoff and Bayside Road are the only two locations where the acceleration and deceleration lanes improvements lie within FEMA designated floodplains. Therefore, these are the only two locations where analysis was conducted.

The area of the proposed improvements for the Bayside Road acceleration and deceleration lanes was compared to the area of the northern watershed 100-year floodplain. These improvements result in a permanent surface area encroachment of 0.45 hectares (1.1 acres), affecting approximately 0.04 percent of the 100-year floodplain area.

The area of the proposed improvements for Indianola Cutoff acceleration and deceleration lanes was compared to the area of the southern watershed 100-year floodplain. These improvements result in an encroachment of 0.8-acres, affecting approximately 0.03 % of the 100-year floodplain area.

The proposed Route 101/Indianola Cutoff interchange (Alternatives 2 and 3 only) would encroach upon the southern watershed, which is a FEMA floodplain. Permanent floodplain encroachment of 3.0 (7.5) hectares (acres) and encroach 0.24% of the 100-year floodplain area within the southern watersheds.

When compared to the total area available for inundation of floodwaters, all proposed construction scenarios result in placement of negligible amounts of fill.

The proposed interchange would not result in an encroachment into the 10.7-meter (35-foot) wide drainage channel adjacent to Indianola Cutoff. All proposed roadway structure work will be required to have no adverse impacts upon the base flood elevation.

For Alternatives 2 and 3, construction of an interchange structure would require substantial amounts of earth fill material. The proposed interchange at Indianola Cutoff would requires placing approximately 300,000 cubic meters (390,000 cubic yards) of fill. Since Alternative 3 requires additional earthwork at the Route 101/Airport Road intersection, 2,000 cubic meters (2,615 cubic yards) more than Alternative 2 would be required. For Alternative 1, construction of only the acceleration and deceleration improvements, with no interchange, would require placing up to 50,000 cubic meters (65,000 cubic yards) of fill.

See section 3.3.2 Wetlands and Other Waters of the United States in this chapter regarding measures taken to reduce impacts to wetlands. Generally, the wetlands coincide with the floodplain.

All work proposed for any of the three Build Alternatives would result in negligible amounts of encroachment into available floodplain areas and all proposed drainage improvements were found to have no decrease in capacity. Therefore, all currently proposed work would not have a substantial effect on the base flood elevations and there would be no increase in flooding risks because of the project.

The No-Build Alternative, Alternative 7, would not involve any new construction and would not encroach on the 100-year floodplain.

Impacts to Floodplain Values

Pursuant to Executive Order 11988, a Federal project in floodplains shall be avoided unless it is the only practicable alternative based on the following:

1. **The practicability of alternatives to any longitudinal encroachments**. Most of the existing Route 101 roadway and bridges within the project limits are either adjacent to, or within the100-year floodplain. Any improvements to this facility to avoid floodplain encroachment would not be feasible.

2. **Risks of the action.** A number of structures are located in the existing 100-year floodplain of Eureka Slough, Freshwater Slough, Fay Slough, Jacoby Creek and Gannon Slough within 1.6 kilometers (one mile) of Route 101. Structures within the floodplain include agricultural buildings, homes and some commercial buildings. All three Build Alternatives would have a less than substantial effect on the base flood elevations and consequently would not increase the potential for flooding risk for any of the structures. Minor widening of the highway fill slopes would comprise a very small portion of the existing floodplain.

3. **Impacts on, and Measures to minimize and to preserve/restore natural and beneficial floodplain values.** The natural and beneficial floodplain values within the project area include wetlands, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, pastureland, natural moderation of floods, and water quality maintenance. Impacts and impact mitigation for these values are discussed in detail in the Human Environment, Visual, Water Quality, and Biological Environment sections in this chapter.

4. **Support of incompatible floodplain development.** None of the three Build Alternatives would directly support, allow, serve or otherwise facilitate incompatible base floodplain development. See Community Impacts section in this chapter for more information.

Temporary Effects

Potential flooding or adverse impacts to the floodplain could result from project construction activities such as clearing vegetation, grading, stockpiling, and excavation activities. A discussion of potential impacts and mitigation measures are discussed in detail in the water quality section in this chapter.

Cumulative Impacts

Current uses of the floodplain are mainly pasturelands for cattle farming. There are some wildlife refuges, agricultural support structures, businesses, and residences within the floodplain. The City of Arcata and the Jacoby Land Trust have purchased substantial parcels of property within the Jacoby Creek Watershed, 61 hectares (150 acres) of which is in the lowermost watershed. This land will not be developed. It is assumed that future uses and levels of development within the floodplain will remain similar to what currently exists. Other known projects in the area that have recently been completed within the last two years or are in the planning phase include:

- Route 101 Median Closure at Cole Avenue - Completed
- Old Arcata Road/ Myrtle Avenue Widening and Rehabilitation Project
- Mad River Water Pipeline Rehabilitation Project - Completed
- City of Eureka - 4th and 5th Streets at V Street Project - Completed
- City of Eureka - Waterfront Drive Extension Project
- Jacoby Creek/Gannon Slough Enhancement Project
- Target Store Project - Completed

None of these projects are identified as having an impact to the floodplain habitat. Therefore, the proposed Eureka to Arcata Route 101 Corridor Improvement Project would not contribute to a substantial adverse cumulative impact to the floodplain habitat.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Since there are no anticipated temporary or permanent floodplain impacts, mitigation is not necessary. However, measures to restore and preserve the natural and beneficial floodplain values in terms of water quality and wetlands are discussed in sections 3.2.2 and 3.3.2.

3.2.2 Water Quality and Storm Water Run-Off

This section is summarized from a Water Quality Study finalized September 2006 and Water Quality Study Supplemental Report finalized in June 2006. This report and supplemental report are available for public review at the Caltrans District 1

office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

Section 401 of the Clean Water Act, the primary federal law regulating water quality, requires water quality certification from the state board or regional board when a project requires a Section 404 permit and would cause discharge into Waters of the United States. Section 402 of the Clean Water Act establishes the National Pollutant Discharge Elimination System permit system for the discharge of any pollutant (except dredge or fill material) into Waters of the United States. To ensure compliance with Section 402, the State Water Resources Control Board has developed and issued a National Pollutant Discharge Elimination System, Statewide Storm Water Permit, to regulate storm water discharges from Caltrans highways and ancillary facilities. The permit regulates both storm and non-storm water discharges during and after construction.

In addition, the State Water Resources Control Board issues the statewide permit for Caltrans construction activities of 0.4 hectare (one acre) or greater. Caltrans projects subject to the Statewide Storm Water Permit require a Storm Water Pollution Prevention Plan, while other projects, smaller than 0.4 hectare or one acre, require a Water Pollution Control Program.

The California Environmental Protection Agency has delegated administration of the federal National Pollutant Discharge Elimination System program to the State Water Resources Control Board and nine regional boards. This project is located within the jurisdiction of the State Water Resources Control Board and the Northcoast Regional Water Quality Control Board.

Subject to Caltrans review and approval, the construction contractor would prepare both the Storm Water Pollution Prevention Plan and the Water Pollution Control Program for the proposed project. The Water Pollution Control Program and Storm Water Pollution Prevention Plan identify construction activities that may cause pollutants in storm water and measures to control these pollutants. Because neither the Water Pollution Control Program nor the Storm Water Pollution Prevention Plan is prepared at this time, the following discussion focuses on anticipated pollution sources or activities that may cause pollutants in the storm water discharges.

The Humboldt County General Plan addresses water quality in Section 3330 and Section 3360 includes the following goal statement:

> "To maintain or enhance the quality of the County's water resources and the fish and wildlife habitat utilizing those resources."

Section 3361 includes the following policies:

> "1. Ensure that land use decisions are consistent with the long term value of water resources in Humboldt County."
>
> "2. Regulate development that would pollute watershed areas."

Section 3362 includes the following standard:

> "1. Development which could potentially 'pollute a watershed area' includes, but is not limited to the placement of septic systems, junkyards, waste disposal facilities, industries using toxic chemicals, and other potentially polluting substances proximate to streams, creeks, reservoirs, or groundwater basins. It can also occur from additions of natural material into a stream because of land use practices but does not include normal agricultural practices which do not require permits from the County."

Additional laws regulating water quality include the Porter-Cologne Water Quality Act, Safe Drinking Water Act, and Pollution Prevention Act. State water quality laws are codified in the California Water Code, Health and Safety Code, and Fish and Game Code Section 5650-5656.

AFFECTED ENVIRONMENT

The Eureka - Arcata Route 101 Corridor Improvement Project extends along the coast of Arcata Bay, which is a part of Humboldt Bay. The entire project length is located in the Humboldt/Arcata Bay watershed and all of the contributing watercourses are east of the project site, except for the ditch between the railroad and Route 101 roadway.

The Pacific Coastal Region experiences a cool maritime climate with a seasonal distribution of precipitation. The average annual rainfall for this area is approximately 1,000-mm (forty-inches) per year. The upper watershed consists of mountainous terrain. There is a high amount of vegetative cover, with minimal development and good soil infiltration. The lower watershed is flat, with a slightly higher concentration of development, good vegetative cover, and less permeable soils. The current land uses in the majority of the project vicinity are: pasturelands for grazing cattle; wildlife refuges; sporadic agriculture structures and homes; and, businesses. A separate project Floodplain Report (Caltrans November 2003) has been prepared for the project and provides additional information on the regional hydrology.

Project receiving water bodies include: Gannon Slough; Jacoby Creek; Old Jacoby Creek; Brainard's Slough (which Rocky Gulch and Washington Gulch flow into); Fay Slough; Eureka Slough/Freshwater Creek; an unnamed drainage channel parallel and to the east of Route 101 (herein referred to as the Route 101 slough); an unnamed

drainage channel parallel and between the railroad and Route 101; and, Arcata Bay. However, due to existing earth dikes, only the highway bridge deck surface area drains to Jacoby Creek and no highway runoff drains into Fay Slough.

Beneficial uses are critical to water quality management in California. State law defines beneficial uses of California's waters that may be protected against quality degradation to include (and not be limited to): "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(0)). Protection and enhancement of existing and potential beneficial uses are the primary goals of water quality planning.

The most sensitive beneficial uses from the standpoint of water quality management are municipal, domestic, and industrial supply, recreation, and uses associated with maintenance of resident and anadromous fisheries. Some of the North Coast Region's rivers are renowned for salmon and steelhead fishing.

ENVIRONMENTAL CONSEQUENCES

The discussion in the first part of this section includes the estimated area of disturbed ground during construction and the net increase in area of paved surface after construction for each alternative. The area of disturbed ground, or exposed earth, provides a broad indication of the potential for storm water runoff and erosion potential. The increase in paved area reflects the potential permanent decrease in percolation of storm water, which results in additional run-off. Both disturbed area and increased run-off are potential concerns if not avoided or minimized. See Tables 3-16 and 3-17 for totals of disturbed soil area and paved areas.

Table 3-16
Anticipated Disturbed Soil Area Within the Project Limits in hectares (acres)

Sub Area	Alternative		
	1	2	3
Jacobs Avenue Ditch	0.4 (1)	0.4 (1)	0.4 (1)
Route 101 Slough	6.1 (15)	12 (30)	14.6 (36)
Brainard Slough	1.2 (3)	1.2 (3)	1.2 (3)
Old Jacoby Creek	1.2 (3)	1.2 (3)	1.2 (3)
Gannon Slough	3.6 (9)	3.6 (9)	3.6 (9)
Totals	13 (31)	19 (47)	21 (52)

Table 3-17 Paved Surface Areas Within the Project Limits in hectares (acres)				
		Alternative		
Sub Area	Existing	1	2	3
Jacobs Avenue Ditch	1.3 (3.2)	1.4 (3.6)	1.4 (3.6)	1.4 (3.6)
Route 101 Slough	12.9 (31.8)	14.0 (34.6)	15.0 (37.0)	15.8 (39.0)
Brainard Slough	2.6 (6.4)	2.8 (7.0)	2.8 (7.0)	2.8 (7.0)
Old Jacoby Creek	2.0 (4.9)	2.3 (5.6)	2.3 (5.6)	2.2 (5.5)
Gannon Slough	10.0 (24.6)	11.0 (27.3)	11.0 (27.3)	11.0 (27.3)
Totals	29 (70.9)	31.6 (78.1)	32.6 (80.5)	33.4 (82.5)
Total Percent Increase		10%	13%	16%

Potential Adverse Water Quality Effects

Alternatives 1, 2, and 3 would have the potential to adversely affect water quality if construction activities are not properly managed. Potential impact for Build Alternatives would be similar. Based on the amount of disturbed soil area and the increase of impervious surface, the Build Alternatives increase in potential adverse impacts to water quality from Alternatives 1, 2, and 3; however, the difference in potential impacts between the Build Alternatives is so slight that water quality impacts should not be weighed heavily as an alternative selection criteria. The predominant sheet flow drainage patterns and abundance of vegetative slopes and swales combined with a climate to sustain vegetation will provide a natural biofiltration treatment for almost all of the storm water runoff.

The primary constituent of concern for the Build Alternatives is sediment both during and after construction. During construction, there could be temporary adverse effects from increased erosion that may eventually be transported into storm drains and receiving waters. After construction, newly vegetated cut and fill slopes have the potential for sediment transport from slope rills and slumps if not inspected and maintained against developing erosion potential.

There is also a slight potential for spills and leaks of lubricant, oil and grease, and other fluids associated with vehicles and equipment during construction. Fueling or maintenance of construction vehicles would occur in the project area during construction and there would be a slight risk of accidental spills or releases of fuels, oils, or other potentially hazardous materials.

Short Term Effects

Short term impacts are those that occur during the construction period and until the project is considered stabilized and complete according to the General Construction Permit. Construction projects are considered stabilized when the disturbed soil is returned to 70% of background coverage. The Build Alternatives have the potential to cause water quality impairments through soil disturbance and the highway construction process. Construction operations will abide by the rainy season requirements set by the North Coast RWQCB and will require a SWPPP with associated Best Management Practices (BMPs) to control potential releases of visible and non-visible pollutants to surface water. In areas of ground disturbance, erosion and sediment control Best Management Practices (BMPs) are implemented to prevent material from entering waterways. These BMPs include the use of silt fences, straw bales, and fiber rolls to prevent sediment from entering adjacent waters.

The following construction activities have the potential to contribute to increases in sediment, turbidity, floating materials, oil, grease and chemicals to receiving waters:

- **Daily contractor activity.** Routine construction activities such as material delivery, storage, and usage, waste management, vehicle/equipment operation, cleaning, maintenance and fueling, and use of a construction staging area may result in generation of dust, sediments, debris, chemicals and garbage. Vehicle/Equipment fueling and maintenance during construction has the slight potential for accidental spills of gasoline, diesel, oil, grease, hydraulic fluids, and other fluids into the environment.

- **Vegetation clearing and grubbing.** Removal or trimming of vegetation would be required for both construction and access. This activity would temporarily eliminate the groundcover that protects the topsoil. Exposed topsoil is more susceptible to erosion.

- **Earthwork.** Earthwork includes removal of the natural and/or stabilizing cover (topsoil) and the creation of engineered cuts and fill slopes and material stockpiles. Prior to establishment of temporary or permanent erosion control measures, cut and fill slopes and earth stockpiles are may be susceptible to erosion.

- **Bridge Demolition and Construction activities.** These activities may involve construction of temporary access roads to bridge abutment and pier locations, construction of falsework, temporary cofferdams, bridge pier construction, pile driving, use of temporary stream crossings and dewatering, and removal of a bridge structure over water. In-water activities in general have the potential for suspending sediments and increasing turbidity levels. Operation of equipment and placement of concrete over the water has the potential for spillage of fluids and construction materials.

- **Dewatering.** Dewatering for bridge pier construction may be necessary and will be required to meet effluent limits of a general Waste Discharge Requirements permit that may be issued by the NC-RWQCB. Any dewatering operations will be required to meet effluent limits established by the NC- RWQCB to sustain the beneficial uses identified in the North Coast Basin Plan.

- **Culvert extensions and floodgate replacement.** Work on culverts and floodgates will require in-water activities that have the potential for suspending sediments and increasing turbidity levels. Operation of equipment adjacent to the water has the potential for spillage of fluids and construction materials.

- **Paving activities.** Paving operations involve the handling of asphalt products that, if not properly managed, could enter storm water runoff.

- **Use and storage of fluids and chemicals.** Accidental spills, improper storage, and improper application of chemicals during construction such as fertilizers and concrete can potentially impact water quality. Improper storage of oils and fuels could result in accidental spills and/or leaks within the construction area.

Because of the proximity of Humboldt Bay to the project site, potential project effects to the freshwater uses of the groundwater due to the proposed project is assumed to be negligible because the groundwater in the area of the project is brackish. None of the project alternatives would increase traffic carrying capacity: consequently, no increase to traffic related pollutant runoff is anticipated from this project.

Long Term Effects

The potential for long term impacts on water quality from the Build Alternatives include:

- **Hydrologic impacts.** The increase in impervious areas typically causes an increase in the peak flow and higher runoff volumes which could lead to channel scouring and bank erosion. This result could increase sediment and turbidity in receiving waters. Because of the site's flat terrain and predominant sheet flow drainage patterns, the 10% to 16% increase in impervious surface created by the Build Alternatives will not likely create channel scouring or bank failures. The existing drainage surfaces and channels show no signs of erosion or scour problems.

- **Concentration of runoff.** Typical highway drainage design involves collecting runoff in pipes or ditches, and discharging, either directly or

indirectly, into receiving waters; however, drainage patterns of this project site are predominantly sheet flow with storm water runoff discharging to the same drainages as pre-project conditions.

- **Highway runoff.** Contaminants generated by traffic, pavement materials, and airborne particles that settle may be carried by runoff into receiving waters; however, an increase in the pollutant levels over the existing conditions as a result of this project is not expected since this project will not increase traffic carrying capacity. The existing vegetated slopes that provide bio-filtration treatment of storm water runoff will be perpetuated.

- **Accidental spills.** Spills caused by highway-related traffic collisions have the potential to cause significant impacts to water quality, depending on the type and quantity of the material spilled. The Build Alternatives would improve traffic safety thereby reducing the potential for vehicle collisions and spills.

Alternative 7 - No Build

Water quality impacts from the No Build Alternatives are as follows:

As warranted, the project area would likely require other smaller projects to maintain or rehabilitate the road surfaces, drainage systems, bridge structures or safety projects. Smaller projects programmed over a longer time frame combined with more required maintenance activities have the potential for water quality impacts.

The potential for spills from traffic collisions within the Eureka to Arcata corridor would remain unchanged, as long as traffic conditions remain stable.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Short Term Minimization and Avoidance Measures

Short-term adverse effects will be avoided or minimized through implementation measures contained in the Standard Specifications, Specials Provisions, permit requirements, and Storm Water Pollution Prevention Plan (SWPPP). Construction related impacts are addressed in the SWPPP prepared by the project construction contractor as required by contract specifications and the Caltrans Statewide National Pollutant Discharge Elimination System Permit Order No. 99-06-DWQ.

A project specific SWPPP with Water Pollution Control Drawings showing locations and scheduling of Best Management Practice (BMP) installations is prepared by the construction contractor and approved by the Caltrans construction Resident Engineer prior to substantial ground disturbance activities.

Construction contract specifications require BMPs be inspected throughout the construction phase prior to a forecasted storm, after a precipitation event which causes site runoff, at 24 hour intervals during extended precipitation events, routinely a minimum of once every two weeks outside of the defined rainy season, and routinely a minimum of once every week during the defined rainy season.

Temporary Construction BMPs include Soil Stabilization, Sediment Control, Wind Erosion Control, Tracking Control, Non-storm water Management, and Waste Management. Detailed BMP installation requirements and specifications are described in the Construction Site Best Management Practices Storm Water Guide and can be viewed at www.dot.ca.gov/hq/construc/Construction_Site_BMPs.pdf.

Temporary Construction BMPs applicable to each construction activity are:

- Daily contractor activity, use and storage of fluids and chemicals requires following proper equipment fueling, spill prevention and control measures, water conservation practices as well as other BMPs.

- Vegetation clearing, grubbing, and earthwork will require a combination of BMPs including straw mulch, fiber rolls, or check dams.

- Bridge construction and demolition activities, culvert extensions, and floodgate replacement will involve the implementation of measures such as installing silt fence and stream bank stabilization.

- Paving and grinding activities will require street sweeping and vacuuming.

Long Term Minimization and Avoidance Measures

To minimize the potential adverse effects from sediment (primary pollutant of concern), permanent BMPs will be installed as appropriate according to the design criteria established in the Caltrans Statewide Storm Water Management Plan (SWMP, May 2003). In addition, selected temporary construction BMPs will remain in place for additional soil stabilization and sediment control measures.

The permanent BMPs applicable to this project include:

- Cut and fill slopes which will receive a hydro-seed application of mulch, straw, stabilizing emulsion, fertilizer, and seed and tree planting formulated by a licensed Landscape Architect to provide a vegetated surface to a minimum of 70% of background native vegetation or equivalent.

- Use of asphalt dikes and over-side drains will be kept to a minimum to maintain storm water sheet flow drainage patterns.

- Drainage conveyance systems will be designed with consideration of downstream effects.

- Use of a retaining wall structure to minimize impacts to adjacent wetlands and existing drainage patterns.

- Sheet flow storm water runoff drainage patterns over vegetated fill slopes and swales will be maximized for bio-filtration treatment. Build Alternatives will perpetuate the existing vegetated slopes and storm water runoff drainage patterns.

The project will be designed and constructed in conformance with the following regulations:

- The Clean Water Act (CWA) of 1972, the major federal legislation governing water quality.

- The Porter-Cologne Water Quality Act, the basis for water quality regulation in California.

- The Caltrans Statewide NPDES Permit, Order No. 99-06-DWQ, covering all Caltrans facilities in the State. In compliance with this permit, Caltrans developed the SWMP to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout the State.

- Construction General Permit, Order No. 99-08-DWQ

With these regulatory control measures currently in place and implementation of BMPs, this project is not likely to adversely impact water quality. Sediment will be the primary constituent of concern during and following construction. During construction, the potential for sediment transport from the project work area and potential for non-storm water releases will be avoided or minimized through the implementation of a project specific SWPPP. After construction, storm water conveyance systems and permanent erosion control measures will be maintained in compliance with the Caltrans SWMP.

3.2.3 Geology, Soils, Seismic, Paleontology, Topography

This section describes the relationships between project features and expected soil conditions in the project area and describes issues related to possible seismic events. This section is summarized from two preliminary geotechnical reports prepared in August 1999 and January 2000. These reports are available for public review at the

Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department's Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period.

AFFECTED ENVIRONMENT

The majority of the project is located along the east side of the North Coast Rail Authority track embankment which, in turn, extends along the easterly shoreline of Arcata Bay. The lowlands are protected from inundation by dikes, floodgates, and the embankments of the railroad and present highway. A drainage channel extends parallel and east of the highway. The northbound (NB) and southbound (SB) lanes were built on separate embankments constructed approximately 30 years apart. The existing SB embankment was constructed in 1918 and surfaced in the 1920's to provide one travel lane for each direction. At that time, a drainage channel was located adjacent to and east of the existing SB embankment. A second roadway embankment was constructed in the 1950's to provide two additional lanes. The drainage channel was moved eastward to its present location, adjacent to and east of the NB embankment. The location of the original drainage channel now serves as the median area between the NB and SB roadway embankments.

In the vicinity of the Route 101 median at Bracut there was a knoll, now known as Brainard Cut. The knoll was completely flattened during the 1950's for the construction of the NB lanes. Its material, thought to consist of non-marine sand and sandstone, was used to construct the NB embankments. Construction records indicate that native earth material unsuitable to support a roadway was excavated to a depth of approximately 1.2-meter (four-feet) from beneath the NB embankment footprint prior to its construction to minimize settlement and increase the embankment stability. The unsuitable material was used as fill material for the channel and median, and to flatten the outside embankment slopes.

The length of the project between the Eureka Slough Bridge and the Route 101/255 interchange to the north, except that in the vicinity of Bracut, consists mostly of unconsolidated, course-to-fine-grained sand and silt (alluvium) typically found on coastal plains, valley bottoms and along river flood plains. This material exhibits potential for liquefaction during earthquakes of sufficient magnitude and duration. Liquefaction is the loss of strength that can occur in loose, saturated soil during or following seismic shaking. The loss of strength is due to the tendency of loose soils to contract and compress when shaken. In a seismic event, liquefaction can produce a number of ground effects, including lateral spreading, boils, ground lurching, and settlement of the fill material. In the vicinity of Bracut, the soil primarily consists of orange-brown non-marine sandstone with clay and gravel (Hookton Formation). The sandstone is usually medium-grained, well sorted, and poorly cemented. Minor beds of well-rounded pebbles and cobbles of chert, quartz, and green stone are also present. There are no highway structural improvements north of the Route 101/255 interchange; consequently geology setting is not discussed north of this interchange.

ENVIRONMENTAL CONSEQUENCES

Temporary effects to soils and geology would occur during construction activities such as grading, leveling, and construction of the proposed interchange at Indianola Cutoff. Effects would be similar for Alternatives 1, 2, and 3; however since Alternative 1 does not include an interchange, it would require much less ground disturbance and would result in fewer impacts to soils and geology.

Construction of an interchange structure at Route 101 and Indianola Cutoff as well other roadway work would require placing approximately 300,000 cubic meters (390,000 cubic yards) of imported earth fill material. Since Alternative 3 requires additional earthwork at the Route 101/Airport Road intersection, 2,000 cubic meters (2,615 cubic yards) more than Alternative 2 would be required. For Alternative 1, construction of only the acceleration and deceleration improvements, with no interchange, would require placing up to 50,000 cubic meters (65,000 cubic yards) of fill. The existing soft silty clay is compressible and placing fill material on native soil would result in consolidation of subsurface soils: consequently, the potential exists for subsurface settlement affecting the structural integrity of the proposed roadway and interchange.

The project area will likely be subjected to substantial seismically induced ground shaking within the design life of the three Build Alternatives. The Caltrans California Seismic Hazard Map dated 1996 indicates that the Mad River fault, located approximately ten-km (6.2-miles) northeast of the project site, could produce a maximum credible earthquake (MCE) of magnitude 6.75. There are several other faults in the vicinity of the site with MCE estimates between 6.0 and 7.0. In general, strong ground shaking can cause one or more of the following:

- Densification of loose granular soils;

- Cracking, spreading, and settlement of embankment material;
- Failure of embankments and natural slopes;
- Liquefaction; and
- Structural distress to bridges, retaining walls, and culverts.

Surface fault rupture and resulting displacement is not expected since there are no known active faults crossing Route 101 between Eureka and Arcata.

Cumulative Impacts

Currently there are no planned or recently constructed structures within two kilometers (1.2 miles) of the proposed interchange: consequently, cumulative geology related impacts are not anticipated.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Other than the slopes for the proposed interchange, Alternatives 1, 2, and 3 would not alter the local topography and, as such, would not affect slope stability within the project area. Embankment settlement and stability analysis will be incorporated in the final project design to reduce the risk of settlement.

Following construction, the proposed Route 101/Indianola Cutoff interchange and bridge structures should be able to withstand a Maximum Credible Earthquake (MCE). Seismic design criteria for the proposed interchange structure are intended to ensure both non-collapse and serviceability when subjected to ground motions during a seismic event.

Best Management Practices (BMPs), minimization measures for soil erosion and water quality, and post-construction revegetation that are proposed as part of the Corridor Improvement Project, would minimize impacts to soils and geology during and after construction. No other measures to minimize harm are required.

3.2.4 Hazardous Waste / Materials

This section is summarized from a report entitled, *Final Report; Phase 1 Environmental Site Assessment; Eureka to Arcata Route 101 Corridor Improvement Project (STIP) and Route 101 Pavement Rehabilitation (RRR); Humboldt County, CA* (Phase 1 Report) finalized September 2003. An addendum was prepared in February 2006. Also, an aerially deposited lead and lead/chromium based paint site investigation report was prepared in December 2005. These reports, as well as numerous memorandums are available for public review at the Caltrans District 1

office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review the hazardous waste studies.

REGULATORY SETTING

Many state and federal laws regulate hazardous materials and hazardous wastes. These include not only specific statutes governing hazardous waste disposal, but also a variety of laws regulating air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous wastes. Other federal laws include:

Community Environmental Response Facilitation Act (CERFA) of 1992
Clean Water Act
Clean Air Act
Safe Drinking Water Act
Occupational Safety & Health Act (OSHA)
Atomic Energy Act
Toxic Substances Control Act (TSCA)
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health, safety, and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

In the project area, the Regional Water Quality Control Board administers federal, state, and local regulations for cleanup of affected surface water, groundwater, and soils that present a threat to water quality. The California Occupational Safety and Health Agency (CalOSHA) has supervisory authority over hazardous substance and waste handling by workers during construction.

AFFECTED ENVIRONMENT

The affected environment was evaluated by researching historical land use, reviewing available databases regarding chemical storage or use, and by a physical inspection.

The historical land use was evaluated primarily by a review of aerial photos of the site and vicinity. The purpose of the historical review was to evaluate whether past uses within and adjacent to the project area may have created adverse environmental conditions that would not appear in the regulatory records review nor be visible during the on-site field reconnaissance.

Three sets of aerial photographs of the project area and vicinity were reviewed. The photographs were taken in 1941, 1950, and 1958. The three sets of photographs reveal that earlier land uses around the project area and surrounding properties included farmlands, wetlands, private residences, industrial and commercial businesses, railroad tracks, and an airport.

Review of aerial photographs revealed land uses around a portion of the project area include an airport and industrial businesses such as a lumber mill. The aircraft fuel and chemicals for industrial use were most likely stored in drums, above ground storage tanks, and underground storage tanks. Soil and/or groundwater may have been affected from historical leaks and/or spills and misuse of these chemicals on the properties. The use of these chemicals and fuels were found to be not sufficiently close to the project corridor to likely have an impact on proposed improvements.

A regulatory database search report was conducted for a study area that included a 0.8-km (0.5-mile) wide corridor between the project construction limits. A database search can identify areas that have known or documented environmental conditions that may affect soil or ground water within the project area. The regulatory database search retrieved properties within the study area that are listed on 23 federal environmental databases, 19 state or local environmental databases, and two Environmental Data Resources, Inc. proprietary historical databases. The results of the database search include the following:

- Addresses of known underground storage tank sites
- Addresses of landfills
- Hazardous waste generation, treatment, storage and/or disposal facilities
- Subsurface contamination known to be present in the study area

Although no sites within the proposed project area were identified in the regulatory databases search; however, 513 sites were identified in the study area (within 0.8 km [0.5 mile] of the project area/existing highway right-of-way). Note that each site may be occupied with multiple facilities. In addition, some sites are listed in multiple databases. A facility or land use is considered to be of potential concern when it is listed on one of the following databases of reported hazardous materials releases:

- National Priority List (NPL)
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
- State Deed Restrictions, California State Spills, Leaks, Investigation, and Cleanup (CA SLIC)
- State Leaking Underground Storage Tank (LUST)
- 1998 California Hazardous Waste and Substances Site List (formerly the Cortese List)
- State Toxic Pits

Based on the database searches, no facilities in the project area were listed.

File and record reviews were also conducted at the Humboldt County Department of Environmental Health (HCDEH), Regional Water Quality Control Board and Department of Toxic Substances Control in November 2002 to identify any facilities considered to be of potential concern from contamination potentially migrating into the project area (but is not listed in the database as being closed or requiring further action).

The following facilities were reviewed in detail and it was found that the eastward flowing groundwater gradient would likely cause containment plumes present to travel away from the project corridor, or the site has been remediated and the case file closed, or the site is sufficiently distant to the project corridor that impacts are unlikely.

- Eureka Oxygen Company, located at 2810 Jacobs Avenue and less than 30.5 meters (100 feet) from the existing Route 101 right-of-way, is a fire extinguisher and compressed gas sales company. An environmental investigation for contaminated groundwater from USTs is currently being conducted. Underground storage tanks were removed in August 2002, but groundwater is still being monitored.
- Humboldt County Department of Public Works, located at 3130 Jacobs Avenue and less than 30.5 meters (100 feet) from the existing Route 101 right-of-way, is a vehicle maintenance facility and garage. An environmental investigation for contaminated groundwater and soil from underground storage tanks is currently being conducted.
- Trinity Diesel Inc., located at 3408 Jacobs Avenue and less than 30.5 meters (100 feet) from the existing Route 101 right-of-way, is an automobile/truck

repair facility. In 1998, the business cleaned and backfilled a waste oil separator. During construction, metals and hydrocarbons as diesel were found in the drainage ditch soil. County files contain a letter from the Regional Water Quality Control Board requesting additional information about analytical reports, but no further correspondence was included.

- Humboldt County Aviation/Northern Air/Chevron 8-4101, located at 4100-4102 Jacobs Avenue at the Murray Field Airport, is an airport fueling station. The Chevron aircraft refueling station is closed and an environmental investigation for contaminated groundwater and soil from underground storage tanks containing aircraft fuel was conducted. The RWQCB issued no further action letter on December 9, 1997. The Environmental Protection Agency (EPA) reopened the site on December 29, 1999, in response to an unidentified leaking pipeline uncovered during construction in September 1999.

A general reconnaissance of the study area was conducted on November 5 and 6, 2002. The site reconnaissance was conducted to evaluate the presence of potential hazardous waste sites identified during the database search, aerial photograph review, and other potential hazardous waste issues within and adjacent to the project area/highway right-of-way. This visual site reconnaissance was conducted from points of public access (closest possible vantage points) and focused on the identification of land uses and potential hazardous conditions within the project area/highway right-of-way. No interviews were conducted, and no unauthorized site walks were undertaken at surrounding businesses. Detailed observations of building interiors and other structures were not made. There was no visible evidence of contamination migrating from any hazardous waste sites within the project area.

All Build Alternatives include replacing the Route 101 southbound Jacoby Creek Bridge and widening both the Route 101 northbound Jacoby Creek Bridge and the northbound Gannon Slough Bridge. A records review of these three separate bridges revealed the southbound Jacoby Creek Bridge was constructed with some asbestos sheet packing material, which would need to be abated during demolition. These three structures are composed primarily of Portland Concrete Cement and were not painted, thus lead base paint residues are not expected to be present.

Aerially Deposited Lead

Several decades of continual vehicle traffic on Route 101 have impacted the project area with aerially deposited lead (ADL). The ADL source is the historic use of automotive gasoline with lead additive. ADL contaminated soils along the project area is an issue for the reuse or off-site disposal of soil during roadway construction and for construction worker safety.

District 1 does not currently have a Department of Toxic Substance Control (DTSC) issued ADL variance that allows for reuse of soil with hazardous waste levels of lead. If a DTSC variance is not in place by the time that the project is ready to proceed into construction, then excavated soil determined to be a hazardous waste will be disposed at a DTSC permitted Class I facility. Care will be taken to minimize the volume of hazardous waste, through careful evaluation of the excavated material, segregation of hazardous soil from non-hazardous soil, and by "grading in place" impacted soil to avoid excavation and the creation of a waste. If a DTSC variance is issued to District 1 prior to the start of construction, the variance will be invoked to re-use excavated soil containing hazardous waste levels of lead wherever possible. Variance requirements regarding management and placement of the soil will be carefully followed.

Naturally occurring asbestos (NOA) is present within some parts of Humboldt County. The closest of these NOA areas are approximately twenty miles easterly of the project site and are thus not of concern.

ENVIRONMENTAL CONSEQUENCES

For all three of the proposed Build Alternatives, there is a high potential for encountering lead contaminated soil during ground disturbing construction activities. In addition, aerially deposited lead (ADL) has been found in soil adjacent to Route 101 and would be partially excavated during construction. Soil testing within the area of proposed earthwork confirmed the lead concentration is sufficiently high to be considered Hazardous Waste.

A preliminary site investigation entitled, "Aerially Deposited Lead and Lead/Chromium Based Paint Site Investigation" was completed in December 2005. Numerous samples were taken throughout the project limits. The test results indicate that within most of the project limits, shallow soil (top 15-cm or 6-inches) material removed will need to be hauled to a permitted hazardous waste facility or may be reused on the project if a variance is secured from the California Department of Toxic Substances Control (DTSC).

The replacement of the southbound Jacoby Creek Bridge is included in all three Build Alternatives. Asbestos would be encountered during bridge demolition. This bridge was never painted with any lead-based paint.

The waste generated from pavement grinding is not expected to have lead and chromium (present within the existing yellow roadway striping) above the California hazardous waste level criteria. The resulting striping and grinding can then be used for shoulder backing fill material within the project limits.

Cumulative Impacts

The construction of any of the project alternatives would have a net positive cumulative environmental effect relating to hazardous substances that presently exist in the project corridor: this is because any one of the project Build Alternatives would remove hazardous substances from the shallow soils within the road shoulders and median areas and, then either encapsulate the material via a California Department of Toxic Substances Control variance or dispose the material at an approved disposal facility.

Construction of any of the proposed Build Alternatives also would not result in creation of hazardous substances and would therefore not contribute to cumulative impacts.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The development of the final project plans, specifications, and estimates will direct the construction contractor's attention to the presence of asbestos in the southbound Jacoby Creek Bridge, and to have a plan for its abatement. A National Emission Standards for Hazardous Air Pollutants permit will be required from the North Coast Unified Air Quality Management District for the demolition of this bridge.

If a DTSC variance is not in place by the time that the project is ready to proceed into construction, then material excavated for removal and that is determined to be a hazardous waste will be disposed at a DTSC permitted Class I facility. Care will be taken to minimize the volume of hazardous waste, through careful evaluation of the excavated material, segregation of hazardous soil from non-hazardous soil, and by "grading in place" impacted soil to avoid excavation and the creation of a waste. If a DTSC variance is issued to District 1 prior to the start of construction, the variance will be invoked to re-use excavated soil containing hazardous waste levels of lead wherever possible. Variance requirements regarding management and placement of the soil will be carefully followed.

Construction workers will be trained to take appropriate precautions to avoid unhealthy conditions when handling and transporting lead contaminated soil during construction.

See the previous section (Water Quality) regarding discussion of on-site hazardous waste/toxic materials spill prevention and accidental spill response plan.

After engineering controls to minimize exposure are implemented, there would be no substantial heath risks from the handling of hazardous substances or waste to the surrounding environment, construction workers, or the public during and after project construction.

3.2.5 Air Quality

This section is summarized from an Air Quality Study finalized August 2006 and an addendum was prepared in July 2006. This study and the addendum are available for public review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

The project area is subject to air quality planning programs established by the federal Clean Air Act (CAA) of 1970 and the California Clean Air Act (CCAA) of 1988. Both the federal and state statutes provide for ambient air quality standards to protect public health, timetables for progressing toward achieving and maintaining ambient standards, and the development of plans to guide the air quality improvement efforts of state and local agencies. National and state ambient air quality standards have been established for several ambient air pollutants (criteria pollutants) which include ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter less than 10 micrometers in diameter (PM_{10}), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and lead (Pb). State and national ambient air quality standards for criteria pollutants are listed in Table 3-18. The U.S. Environmental Protection Agency (EPA) typically imposes emission limitations upon individual sources of air pollutants by local agencies or upon certain large or unique facilities. Mobile sources of air pollutants such as automobiles, aircraft, and trains are controlled primarily through state and federal agencies. Within the project vicinity, air quality is monitored, evaluated, and controlled by the EPA, California Air Resources Board (CARB), and the North Coast Unified Air Quality Management District (NCUAQMD). The EPA, CARB, and NCUAQMD develop rules and regulations to attain the goals or directives imposed by legislation. The major elements of this air quality regulatory framework, as they might pertain to the review of the proposed project, are summarized after Table 3-18.

Table 3-18
State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	Federal Standard	Health and Atmospheric Effects	Typical Sources
Ozone (O_3)[2]	1 hour 8 hours	0.09 ppm 0.070 ppm	--- 0.08 ppm	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.	Low-altitude ozone is almost entirely formed from reactive organic gases (ROG) and nitrogen oxides (NOx) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes. Biologically-produced ROG may also contribute.
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	9.0 ppm[1] 20 ppm 6 ppm	9 ppm 35 ppm ---	Asphyxiant. CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
Respirable Particulate Matter (PM_{10})[2]	24 hours Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 ---	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).
Fine Particulate Matter ($PM_{2.5}$)[2]	24 hours Annual	--- 12 µg/m^3	35 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – considered a toxic air contaminant – is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.
Nitrogen Dioxide (NO_2)	1 hour Annual	0.25 ppm ---	--- 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain.	Motor vehicles and other mobile sources; refineries; industrial operations.
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours Annual	0.25 ppm --- 0.04 ppm ---	--- 0.5 ppm 0.14 ppm 0.030 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing.
Lead (Pb)[3]	Monthly Quarterly	1.5 µg/m^3 ---	--- 1.5 µg/m^3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Primary: lead-based industrial process like batter production and smelters. Past: lead paint, leaded gasoline. Moderate to high levels of aerially deposited

Pollutant	Averaging Time	State Standard	Federal Standard	Health and Atmospheric Effects	Typical Sources
				Also considered a toxic air contaminant.	lead from gasoline may still be present in soils along major roads, and can be a problem if large amounts of soil are disturbed.
Sulfate	24 hours	25 μg/m^3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	Reduces visibility. Produces haze. NOTE: not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See particulate matter above.
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes

Notes: ppm = parts per million; μg/m^3 = micrograms per cubic meter

1 Rounding to an integer value is not allowed for the State 1-hour CO standard. A violation occurs at or above 9.05 ppm.

2 Annual PM_{10} NAAQS revoked October 2006; was 50 μg/m^3. 24-hr. $PM_{2.5}$ NAAQS tightened October 2006; was 65 μg/m^3.

3 The ARB has identified lead, vinyl chloride, and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the ARB and U.S. EPA have identified various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There is no threshold level of exposure for adverse health effect determined for these toxic air contaminants, and control measures may apply at ambient concentrations below any criteria levels specified for these pollutants.

Greenhouse Gases and Climate Change:

Carbon dioxide and similar "greenhouse gases" are not considered "pollutants" under the Federal Clean Air Act by U.S. EPA, and are not subject to ambient air quality standards unless they fall into one of the categories above. That position by EPA is currently being litigated. EPA is, however, active in the global warming mitigation arena, and in most cases greenhouse gas emission reduction is approached through energy efficiency improvement. For more information, see: http://yosemite.epa.gov/oar/globalwarming.nsf/content/index.html.

Carbon dioxide and similar "greenhouse gases" are not considered criteria pollutants under the California Clean Air Act, and ambient air quality standards have not been set. They are, however, regulated by the California Air Resources Board (ARB) based on legislative direction and Governor's executive orders. Carbon dioxide emission reduction measures are required for on-road motor vehicles; ARB's 2005 motor vehicle greenhouse gas regulations are in litigation. For more information on ARB's climate change program see: http://www.arb.ca.gov/cc/cc.htm.

There are a number of greenhouse gases, of varying potency. Since carbon dioxide (CO_2) is the most prevalent greenhouse gas, most "GHG" analyses express greenhouse gas emissions in terms of "CO_2 equivalent." Although CO_2 emissions themselves are closely related to fuel consumption, some of the other gases are less so.

Sources:

California Air Resources Board Ambient Air Quality Standards chart (http://www.arb.ca.gov/aqs/aaqs2.pdf)
Sonoma-Marin Area Rail Transit Draft EIR Air Pollutant Standards and Effects table, November 2005, page 3-52.
U.S. EPA and California Air Resources Board air toxics websites, 05/17/2006
U.S. EPA Final Rulemaking (Federal Register, 17 October 2006, 71 FR 61144)

Updated: 2/5/2007

Federal

The 1990 CAA Amendments require that each state have an air pollution control plan called the State Implementation Plan (SIP). The SIP, which is reviewed by the Environmental Protection Agency (EPA), includes strategies and control measures to attain the national ambient air quality standards by deadlines established in the CAA. The Environmental Protection Agency reviews the SIP to determine if the plan would conform to the 1990 CAA Amendments and achieve the CAA air quality goals. As described later in this chapter, federally funded transportation projects such as the proposed project must be included in regional transportation plans that achieve the air quality goals of the SIP. Plans may also include interim milestones for progress toward attainment.

The U.S. EPA has classified air basins (or portions thereof) as being in "attainment," "nonattainment," or "unclassified" for each criteria air pollutant, based on whether or not the national ambient air quality standards have been achieved. The U.S. EPA classifies the North Coast Air Basin as being in attainment or unclassified for all criteria pollutants. When an air basin is defined as "unclassified," typically, these areas are not considered to have air quality problems (e.g. sparsely populated areas). The project, however, is located in an air basin that is not in attainment for particulate matter pursuant to State air quality standards.

The U.S. EPA signed the final rule on February 23, 2006 which established requirements for project-level conformity determinations for particulate matter 2.5 microns diameter or less ($PM_{2.5}$) nonattainment and maintenance areas. This final rule is part of EPA's implementation of the current $PM_{2.5}$ standards. This rule requires that $PM_{2.5}$ "hot spot" analyses are included in project-level conformity determinations only for new transportation projects with significant diesel traffic, such as major highway projects and projects at congested intersections that handle significant diesel traffic. In general, hot spots are localized areas at which pollutants exceed the National Ambient Air Quality Standards (NAAQS). PM_{10} is required to be considered and evaluated on a local impact basis for projects of air quality concern.

Under National Ambient Air Quality Standards, Humboldt County is designated as unclassified/attainment for all transportation related criteria pollutants (CO, Ozone, PM_{10}, $PM_{2.5}$). Under California Ambient Air Quality Standards, it is designated as attainment for CO $PM_{2.5}$, and Ozone, non-attainment for PM_{10}. This project does not comply with the definition of a "project of air quality concern". A project of air quality concern is defined by the final rule of 40CFR 93.123(b)(1) as:

"…(i) New or expanded highway projects that have a significant number of, or significant increase in diesel vehicles;

(ii) Projects affecting intersections that are at Level-of Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;…"

The project Build Alternatives would generally improve Route 101 and commercial truck traffic on Route 101 comprises about 5% of the total traffic volume. Since this project is a highway improvement project, it is not expected to substantially increase the volume of diesel vehicles. Therefore this project does not require a PM hot-spot analysis.

Mobile source air toxics (MSATs) are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxins also result from engine wear or from impurities in oil or gasoline. The six air toxics labeled by EPA as priority transportation MSATs are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. The purpose of the proposed project is to improve safety and implementation of the project would result in increased travel speeds and improved Level-of-Service which will reduce emission of volatile organic compound (VOC)-based MSATs (benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene); the effect of speed changes on diesel particulate matter is unknown. This speed benefit may be offset somewhat by increased vehicle miles traveled since out-of-direction travel would result from Route 101 median access closures. However, EPA regulations for vehicle engines and fuels will result in overall MSATs to decline substantially over the next twenty years. According to an FHWA analysis, even if the vehicle miles traveled (VMT) increase by 64 percent, reductions from 57 to 87 percent in MSATs are projected from 2000 to 2020. (Source: FHWA 2006 Interim Guidance on Air Toxic Analysis for NEPA Documents.)

State and Local

The CARB regulates mobile emissions sources and oversees the activities of county and regional air quality management districts. The CARB regulates local air quality indirectly by establishing vehicle emission standards through its planning, coordinating, and research activities.

California has adopted ambient standards that are generally more stringent than the national standards for the criteria air pollutants (see Table 3-18). Under the CCAA, which was patterned after the federal CAA, areas are designated as being in "attainment," in "nonattainment," or "unclassified," with respect to the state ambient air quality standards. The CCAA requires that districts design a plan to achieve an annual reduction of five percent or more in district-wide emissions for each nonattainment criteria pollutant or its precursor(s). The CARB has designated the North Coast Air Basin as nonattainment for the State PM_{10} standards and attainment or unclassified (see earlier discussion) for all other criteria pollutants (see Table 3-18).

PM_{10} consists of particles in the atmosphere resulting from many sources, including fume producing industrial and agricultural operations, motor vehicle tire wear, fossil fuel combustion, atmospheric photochemical reactions, burned agriculture waste, construction activities, and wind-raised dust. Current standards apply to concentrations of particles that are smaller than ten micrometers in diameter, which are referred to as PM_{10}. In May 1995, NCUAQMD adopted its Particulate Matter (PM_{10}) Attainment Plan, which includes measures to reduce PM_{10} emissions from mobile sources, wood stoves, and other combustion sources. This area is not in attainment of the State PM_{10} standards.

The NCUAQMD has jurisdiction over air quality in the North Coast Air Basin and regulates most air pollutant sources, except for motor vehicles, locomotives, aircraft, agriculture equipment, and marine vessels. The NCUAQMD, along with the CARB, maintains ambient air quality monitoring stations at numerous locations throughout the air basin to measure criteria pollutant levels.

Transportation Conformity

Transportation projects receiving federal funding or approval must be found to conform to the current SIP. Each region in the State submits to the CARB its emissions budgets and strategies for reducing air emissions of air pollutants that are above national ambient air quality standards. The CARB prepares the SIP.

Transportation planning is coordinated with this "conformity" process. The Regional Transportation Plan (RTP) contains a long-range plan for transportation projects and emissions budgets for those projects within the jurisdiction of a local regional

transportation agency, which in this case is the Humboldt County Association of Governments. The RTP must conform to the SIP by having an emissions budget from its planned projects that does not exceed the emissions budget in the SIP. However, this project is located within an area that is in attainment for all Federal criteria pollutants, thus conformity does not apply.

Coordination with North Coast Unified Air Quality Management District

Humboldt County is included in the North Coast Air Basin along with Del Norte, Trinity and Mendocino Counties. These counties operate as a unified special district, also called the North Coast Unified Air Quality Management District (NCUAQMD), which manages air resources in this mountainous, predominantly rural region.

Most major air pollutants in Humboldt County-especially for mobile sources-are well below levels that the state considers harmful. Sources of ozone precursor emissions are low enough that ozone smog does not rise to significant levels, even during periods of minimal air movement. The entirety of the North Coast Air Basin has been designated as "attainment" or "unclassified" for all criteria pollutants (carbon monoxide, ozone, sulfur oxides, and nitrogen dioxide) and is subject to "Prevention of Significant Deterioration" (PSD) permit procedures. Except for Redwood National Park, which is designated Class I, all of Humboldt County is designated as a Class II area.

Long term impacts on regional air quality are projected to increase at a slower rate than in the past, due to conversion to more efficient and lower emission vehicles, RTP plan policies and actions encouraging public transit use and conversion of transit vehicles to alternative fuels, and programs and improvements designed to increase bicycle and pedestrian system use. (Source: Humboldt County 2006 Regional Transportation Plan Update http://www.hcaog.net/docs/RTP.2006/)

AFFECTED ENVIRONMENT

Climate, Meteorology, Asbestos, and Topography

The topography of the project area is generally flat and close to sea level in elevation. The project area is located adjacent to Arcata Bay, which is a portion of Humboldt Bay. There is no significant topographical barrier separating the project area from the Pacific Ocean, approximately five-kilometers (3.1-miles). The land slopes gently upward from Humboldt Bay toward the Coast Range approximately 0.8 kilometers (0.5-miles) east of the project area, reaching the top of its first ridge approximately 9.7-kilometers (six-miles) to the east. This ridge extends in an approximate semicircle from a point 32-kilometers (twenty-miles) north of Eureka to a point forty kilometers (25-miles) south.

The climate of the project area is completely maritime. Though there are definite rainy and dry seasons; high humidity exists throughout the year. The rainy season lasts from October through April accounting for about 90 percent of the annual precipitation. The dry season, lasting from May through September, is typically marked by intrusions of low clouds and fog during nights, mornings, and evenings, and sunny afternoons. Because of the proposed project's proximity to Arcata Bay, the project area may remain foggy or overcast throughout the day. The proximity of the project area to the Pacific Ocean and the prevailing northwest winds, which blow across the cold upwelling water that is generally present off the coast of Humboldt County, keeps temperatures moderate. Colder lows are in the mid 30s (Fahrenheit) and the warmer highs in the mid 70s.

Naturally occurring asbestos is known to occur in some serpentine rock and ultramafic rock in California. Exposing or disturbing these rocks can release this toxic material and potentially expose the public. There is no ultramafic rock or serpentine rock located in the vicinity of the proposed project.

Existing Air Quality

Air quality in the North Coast Air Basin is a function of the criteria pollutants that are emitted locally, the existing regional ambient air quality, and meteorological and topographic factors. In general, the frequently strong northwest winds are very effective in dispersing pollutants. However, during summer months, atmospheric temperature inversions are common, and this limits vertical air pollutant dispersion. Overall, the land use (not heavily urbanized) and the persistent coastal winds keep air pollutant levels low. A five-year summary of the measured concentrations of criteria air pollutants in the project area is provided in Table 3-19.

Table 3-19
Pollutant Data Summary Table

Pollutant[1]					
	2001	2002	2003	2004	2005
Particulate Matter <10 um (PM_{10}) (µg/m^3)					
Highest 24-hour Concentration	67.1	38.0	71.1	63.9	71.0[2]
Measured Days>State Standard	2		3	2	1
Measured Days>National Standard	0		0	0	0
State Annual Geometric Mean	21.3	--[3]	--[3]	--[3]	--[3]
National Annual Arithmetic Mean	20.8	18.5	17.8	20.7	13.6
Particulate Matter <2.5 um (PM2.5) (µg/m^3)					
Highest 24-hour Concentration	32.6	23.7	36.1	25.6	31.8
Days>National Standard	0	0	0	0	0
National Annual Average	9.4	7.9	--[3]	8.2	--[3]

Source: California Air Resources Board website
Notes:
[1]Data from a monitoring station located at the Eureka Health Department Building at the intersection of 6th and I Street.
[2]Annual data capture for PM_{10} in 2005 was 28%.
[3]No listing of the percentage annual data captured.

ENVIRONMENTAL CONSEQUENCES

Potential air quality impacts from the proposed project would result from two activities associated with the project: construction of the proposed project and vehicular use (operation) of the proposed project once construction is complete. The impacts associated with construction would be short-term, temporary adverse effects, while the impacts associated with traffic would be long-term, permanent adverse effects.

Mobile Source Air Toxics Effects

The purpose of this project includes improving safety, intersection Level-of-Service, and extending the serviceable life of the Route 101 roadway and intersections

between Eureka and Arcata by constructing various improvements (refer to Chapter 2 for more information). This project would not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such, FHWA has determined that this project would generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. Consequently, this effort is exempt from analysis for MSATs.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next twenty years. Even after accounting for a 64 percent increase in VMT, FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs as well as the possibility of even minor MSAT emissions from this project. (Source: http://www.fhwa.dot.gov/environment/airtoxic/020306guidapa.htm)

Traffic-Related Carbon Monoxide Effects

California's carbon monoxide air quality standards would be violated if a change in traffic patterns related to the proposed project causes a localized increase in carbon monoxide concentrations that exceeds California's ambient air quality standards. Localized CO air quality impacts were analyzed for the proposed project. The procedures in *Transportation Project-Level Carbon Monoxide Protocol*, prepared by the University of California, Davis, Institute of Transportation Studies (CO Protocol), were used to analyze CO impacts. This protocol describes different screening procedures, based on the attainment status of the area in which the project is planned, that can be used to evaluate potential CO impacts of the project and assess the need to perform localized CO air quality impact modeling.

For projects such as the proposed project in CO attainment areas, the first level of analysis outlined by the CO Protocol is to determine if the project would lead to an increase in CO emissions. Comparing the following traffic variables between the Build Alternatives and No-Build Alternative allows this for determination:

- The Build Alternatives do not increase the percentage of vehicles operating in cold-start mode (a phase of engine operation that produces a higher proportion of air pollutants) by more than two percent over the No-Build Alternative.
- The Build Alternatives do not increase traffic volumes in excess of five percent over the No-Build Alternative.
- The Build Alternatives do not cause a decrease in traffic speeds.
- The Build Alternatives improve traffic flow over the No-Build Alternative.

- The Build Alternatives would not move traffic substantially closer to buildings or sidewalks.

If any of the Build Alternatives do not satisfy all of the above criteria, then that particular alternative could potentially cause an increase in CO emissions over the No- Build Alternative. For project alternatives that potentially cause an increase in CO emissions above the No-Build Alternative, the CO Protocol describes a comparative analysis between a current roadway ("worst case roadway") in an area demonstrating CO attainment and the proposed project. This comparative analysis is intended to assess the potential of higher CO concentrations at the worst-case roadway with the proposed project. If the worst-case roadway is demonstrated to have higher CO concentrations than the proposed project, the conclusion can be made that the proposed project would not lead to a violation of CO standards since the worst-case roadway does not cause a violation in CO standards. The CO emissions from the proposed project would not cause a violation of the CO standards if the following criteria were satisfied:

- Representative residence locations are the same distance or farther from the proposed project than the residence locations at the worst-case roadway in the attainment area.

- The proposed project traffic volumes are the same or lower than those of the worst-case roadway.

- Assumed meteorology for the proposed project is the same or better than that for the worst-case roadway.

- Percentage of vehicles operating in cold-start mode is the same or lower for the proposed project when compared to the worst-case roadway in the attainment area.

- Percentage of heavy-duty gas trucks for the proposed project would not be greater than that for the worst-case roadway.

- Background CO concentrations in the proposed project area are the same or lower than that in the area of the worst-case roadway.

If the proposed project satisfies the above conditions, it would not lead to a violation of the CO standards. This conclusion can be made, because the worst-case roadway currently existing in an attainment area does not cause CO concentrations to exceed ambient air quality standards, and the proposed project's CO concentrations would be lower than the worst case roadway's CO concentrations. The impact would not be considered substantial and no further analysis, such as a micro scale CO model, is required.

Carbon Monoxide Emission Assessment Methodology

Comparison of the Build Alternatives and the No-Build Alternative showed that Alternatives 1, 2, and 3 would result in an increase in carbon monoxide (CO) emissions over the No-Build Alternative. Several affected roadway segments of Old Arcata Road, Myrtle Avenue, State Route 255, and highway segments of Route 101 for these Build Alternatives would experience traffic volume increases greater than five percent over the No-Build Alternative, projected for the year 2031. Additionally, Indianola Cutoff would experience over a forty percent increase in traffic volumes for the Build Alternatives 2 and 3 over the No-Build Alternative. By not satisfying these criteria of the CO Protocol, which is outlined above, these Build Alternatives have demonstrated that they would result in an increase in CO emissions over the No-Build Alternative. Therefore, the comparative analysis with worst-case roadways, described above, was necessary to assess CO impacts for all Build Alternatives.

To conduct the comparative analysis with a worst-case roadway, the intersection and Route 101 mainline (excluding ramps, frontage roads, etc.) sections of the proposed project with the potential to produce the highest CO concentrations for any build alternative were selected. For this analysis, if the intersection and mainline sections are shown to not produce a violation in the CO standards, then all intersections and mainline segments for all of the Build Alternatives would not violate the CO standards.

Based on traffic model projections, the intersection of Myrtle Avenue and Freshwater-Kneeland Road, under Alternative 1, would be the intersection to have the highest potential CO levels resulting from the proposed project for the Build Alternatives. High CO levels would be expected based on the projected poor Level-of-Service (LOS F) and high traffic volumes. This intersection of the proposed project will be compared to a worst-case intersection. The intersection of Route 101 and Henderson Street in Eureka would qualify as a worst case intersection because it meets the criteria outlined in the CO Protocol and reiterated in the preceding methodology section in this subchapter.

The mainline (through traffic lanes) section of Route 101 between Indianola and Cole Avenue, under Alternative 2, would have the highest mainline traffic volumes and would therefore have the highest potential CO concentrations of any mainline roadway segment for either Build Alternatives affected by the proposed project. Therefore, Route 101 between Indianola and Cole Avenue will be the mainline section of the proposed project compared to a worst case mainline. The mainline roadway segment of Route 101 at Fourth Street in Santa Rosa (worst case mainline) would qualify as worst-case roadway, because it meets the criteria outlined in the CO Protocol and reiterated in the above Methodology section.

Although there are closer locations to the proposed project area than Santa Rosa that would qualify as a worst-case roadway for most of the comparison criteria listed above, Route 101 in Santa Rosa at Fourth Street is the closest highway segment that

meets all the comparison criteria (described in more detail below). It is the closest mainline roadway segment that has current traffic volumes equal to or greater than the forecasted volumes for the proposed project mainline roadway segment in the year 2031. The land use projections used to calculate the 2031 traffic volumes for the proposed project show a large increase in traffic volumes compared to current traffic volumes in the project area. These projected traffic volumes would be higher than any currently existing traffic volumes along Route 101 north of Santa Rosa. Therefore, Route 101 at Fourth Street in Santa Rosa is the most appropriate worst-case roadway segment.

Mainline Analysis

The worst case mainline is located in downtown Santa Rosa, where the highway is adjacent to potential receptors (buildings, sidewalks). The closest receptors to Route 101 between Indianola Cutoff and Cole Avenue are approximately forty-meters (130-feet) from the roadway. The design of Route 101 between Indianola Cutoff and Cole Avenue will not allow for receptors to be as close to it as Route 101 in Santa Rosa, because Route 101 between Indianola and Cole Avenue is not an elevated structure that can be directly adjacent to receptors. Therefore, the receptor locations are closer to Route 101 in Santa Rosa than those projected to be adjacent to Route 101 between Indianola Cutoff and Cole Avenue based on planned land uses. The existing traffic volumes at Route 101 in Santa Rosa are approximately double the 2031 projected traffic volumes for Route 101 between Indianola Cutoff and Cole Avenue.

The meteorological conditions of Route 101 in Santa Rosa are somewhat similar to those for Route 101 between Indianola Cutoff and Cole Avenue. Wind patterns are relatively similar between Route 101 between Indianola Cutoff and Cole Avenue and Route 101 in Santa Rosa. The minimum temperatures are lower at Route 101 in Santa Rosa, which would lead to higher CO emissions and concentrations. Therefore, meteorologically, there is a greater probability for CO concentrations to be higher at Route 101 in Santa Rosa than at Route 101 between Indianola Cutoff and Cole Avenue.

The percentage of vehicles operating in cold-start mode is not expected to be substantially different for Route 101 between Indianola Cutoff and Cole Avenue than that for Route 101 in Santa Rosa. At maximum, each can expect 10-15% of vehicles operating in a cold-start mode according to the *Transportation Project-Level Carbon Monoxide Protocol*, prepared by the University of California, Davis, Institute of Transportation Studies.

The percentage of heavy-duty gas trucks would be similar at Route 101 between Indianola Cutoff and Cole Avenue and Route 101 in Santa Rosa.

Background CO concentrations would be higher at Route 101 in Santa Rosa than at Route 101 between Indianola Cutoff and Cole Avenue, because the land uses

surrounding Route 101 in Santa Rosa are denser than the predicted land uses surrounding Route 101 between Indianola Cutoff and Cole Avenue.

Route 101 between Indianola Cutoff and Cole Avenue, under Alternatives 2 and 3, which are predicted to have higher mainline daily traffic volumes than Alternative 1, satisfies the comparison analysis conditions listed above and would not contribute to an exceedance of CO emission standards. Therefore, no mainline roadway section affected by the proposed project for the three Build Alternatives would lead to a violation of the CO standards.

Intersection Analysis

Receptor locations are as close or closer to the intersection of Route 101 and Henderson Street than those projected to be adjacent to the intersection of Myrtle Avenue and Freshwater-Kneeland Road. Peak hour traffic volumes at the intersection of Route 101 and Henderson Street are approximately three times greater than those projected at the intersection of Myrtle Avenue and Freshwater-Kneeland Road.

The meteorological conditions of the intersection of Route 101 and Henderson Street are the same as those for the intersection of Myrtle Avenue and Freshwater-Kneeland Road. The two intersections are located near Humboldt Bay, approximately 8.2-kilometers (5.1-miles) apart.

The percentage of vehicles operating in cold-start mode is not expected to be substantially different for the proposed project than that for the intersection of Route 101 and Henderson Street. At maximum, each can expect 10-15% of vehicles operating in a cold-start mode according to the *Transportation Project-Level Carbon Monoxide Protocol*, prepared by the University of California, Davis, Institute of Transportation Studies.

It is assumed that there would be more heavy-duty gas trucks present at the intersection of Route 101 and Henderson Street than at the intersection of Myrtle Avenue and Freshwater-Kneeland Road. This is due to denser urban land uses surrounding the intersection of Route 101 and Henderson Street compared to the worst-case intersection on Route 101.

Background CO concentrations would be higher at the intersection of Route 101 and Henderson Street than at the intersection of Myrtle Avenue and Freshwater-Kneeland Road because the land uses surrounding the intersection of Route 101 and Henderson Street are denser than the predicted land uses surrounding the intersection of Myrtle Avenue and Freshwater-Kneeland Road.

The intersection of Freshwater-Kneeland Road and Myrtle Avenue, under Alternative 1, satisfies the conditions listed above and would not contribute to a localized exceedance of CO emission standards. Therefore, none of the intersections of the

proposed project for any of the three Build Alternatives would lead to a violation of CO standards.

Conclusion

As shown in the above analyses of CO impacts, the mainline segments and intersections affected by the proposed project, at year 2031, would have lower potential CO concentrations than the worst case mainline segment and worst case intersection. These worst-case roadways currently exist in regions that demonstrate attainment of ambient CO levels. As such, none of the three Build Alternatives would result in a violation of the CO standard.

Regional Cumulative Impacts

Operation of the proposed project would result in regional emissions of ozone precursors (nitrogen oxides and reactive organic gases), carbon monoxide, and inhalable particulate matter (PM_{10} and $PM_{2.5}$) that could have a cumulative effect with other pollutant sources in the area. These emissions are addressed and accounted for in the regional analysis that was performed for the proposed project's inclusion in the RTP for Humboldt County. This RTP was found to conform to the SIP.

Construction Effects

Construction is a source of dust emissions that can have temporary impacts on local air quality (i.e., exceed state or national air quality standards for PM_{10}). Construction emissions would result from earthmoving (fugitive dust) and heavy equipment use (vehicle exhaust). These emissions would be generated from land clearing, ground excavation, cut and fill operations, delivery of excavated material, and the construction of the project facilities. Dust emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather.

In addition to particulate emissions from earth moving, combustion emissions from fuel-powered construction equipment may create a temporary impact on local air quality. NCUAQMD CEQA Guidelines do not provide a numerical threshold of significance for these emissions. Instead, the emphasis is on minimization of this type of temporary effect. NCUAQMD Regulation 1 Rule 430 specifies measures to minimize harm for controlling fugitive dust emissions. If the project follows the practices described in Regulation 1 Rule 430, the impact is considered not significant. Measures to minimize fugitive dust are described later in this subchapter.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction

As discussed previously, impacts from dust generation by excavation and construction activities would be localized and of a temporary nature. Dust control practices, as described in NCUAQMD Regulation 1 Rule 430 and below would be employed to minimize or avoid potential exceedances (violations) of the PM_{10} air quality standard during construction. Diesel trucks importing construction material would emit exhaust pollutants during a two-year period. Exhaust emissions from these trucks were estimated using EMFAC2002 and are summarized below:

- CO 1.4-kilograms (3.0 pounds) per day
- ROG 0.54-kg (1.2 pounds) per day
- NO_x 8.6-kg (19 pounds) per day
- PM_{10} 0.14-kg (0.3 pounds) per day

These emissions are minimal and would not cause a significant impact to air quality. Reasonable precautions will be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions:

- Covering open-bodied trucks when used for transporting materials likely to give rise to airborne dust.

- Use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials at aggregate plants may be considered. Containment methods may be employed during sandblasting and other similar operations.

- The use of water or suitable chemicals for control of dust in construction operations, the grading of roads, or the clearing of land.

- The paving of roadways and their maintenance in a clean condition.

- The prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

In addition, employing the following measures to minimize pollutant emissions from construction equipment exhaust will be employed as appropriate and reasonable:

- Keeping engines properly tuned;

- Limiting idling;

- Avoiding unnecessary concurrent use of equipment.

After construction, none of the Build Alternatives would have a significant impact on air quality: consequently, no project-specific air quality-related mitigation measures are required.

3.2.6 Noise

This section is summarized from a noise impact study finalized in August 2006. In addition, a noise evaluation was completed in 2006 to address the rehabilitation and bridge construction work portion of the project. These reports are available for public review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

This section includes several technical terms and concepts to describe traffic noise. For an explanation to gain a better understanding of this section, please refer to Appendix F - Traffic Noise Fundamentals.

REGULATORY SETTING

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment.

Under 23 Code of Federal Regulations 772.7, projects are categorized as Type I or Type II projects. FHWA defines a Type I project as a proposed Federal or Federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway, which significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment.

Under 23 CFR 772.11, noise abatement must be considered for Type I projects if the project is predicted to result in a traffic noise impact. In such cases, 23 CFR 772 requires that the project sponsor “consider” noise abatement before adoption of the final NEPA environmental documentation. This process involves identification of noise abatement measures that are reasonable, feasible, and likely to be incorporated into the project, and noise impacts for which no apparent solution is available.

Type I projects include projects that create a completely new noise source and projects that increase the volume or speed of traffic or move the traffic closer to a receiver (e.g. residence, public park). Type I projects could include the addition of an interchange, ramp, auxiliary lane, or truck-climbing lane to an existing highway, or the widening an existing ramp by a full lane width for its entire length (Federal

Highway Administration 1995). The addition of an auxiliary lane should also be classified as a Type I project if the lane is long enough to function as a through-traffic lane or increases capacity.

The Eureka-Arcata corridor improvement project meets the Type I category because of Alternatives 2 and 3 include an interchange. In addition, all three Build Alternatives would include increasing the posted speed limit or moving traffic closer to the residents on Jacobs Avenue.

For highway transportation projects with FHWA involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. These regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). Table 3-20 lists the noise abatement criteria. (See Appendix F for an explanation of dBA.)

Table 3-20
FHWA Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, dBA L_{eq}(h)	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D		Undeveloped lands.
E	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

In accordance with the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006*, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a twelve dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within one dBA of the NAC.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

AFFECTED ENVIRONMENT

Study Methods and Procedures

Identification of Receiver Locations. Noise receiver (existing residences) locations exposed to potential traffic noise impacts were identified along the project route (see Figure 3-23). Category B land uses in the vicinity of the project area, including a mobile home park and a campground, were identified through a review of aerial photos of the project area and a subsequent visit to the study area. There are two other Category B land uses consisting of public ball fields. These ball fields are located near the Route 101/255 interchange, which there would be no or negligible change in traffic speed or volumes from the project. Activity Category A, C, and D areas, were not included in the study since within the project area, they experience infrequent human use and would not benefit from a lower noise level.

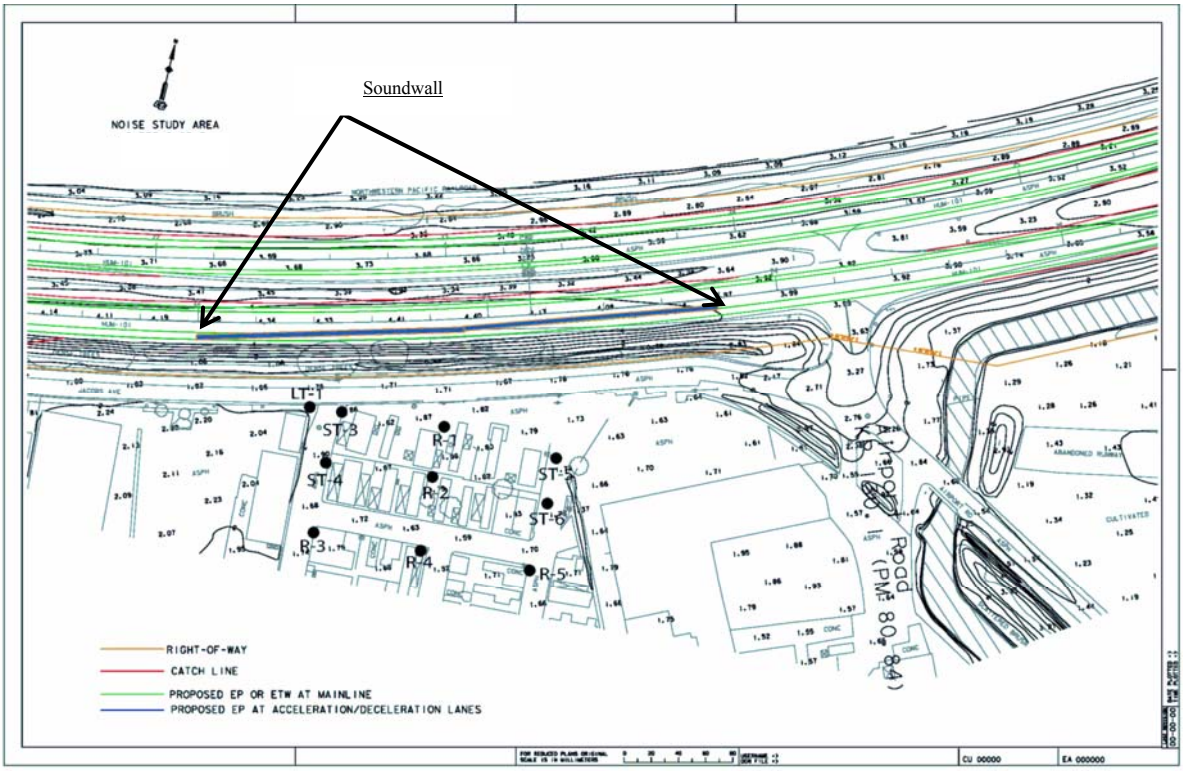


Figure 3-23
Map indicating noise receiver locations at Lazy J Trailer Ranch and soundwall location

Measurement of Existing Sound Levels. A summary of measured traffic noise levels and corresponding noisiest hour noise levels are shown in Table 3-21. Because traffic noise can vary substantially over time, noise measurements are conducted over varying time periods. Noise measurements were conducted at two Category B receiver locations: a mobile home park (Lazy J Trailer Ranch) and a campground (KOA) from June 10 - 11, 2003. The noise measurement program consisted of a combination of long-term measurements (24-hours in duration) and short-term measurements (ten-minutes in duration). Two long-term noise measurement locations and five short-term noise measurement locations were selected to represent the varying noise exposures of the identified Category B receivers.

Table 3-21
Existing Noise Levels*

Site	Location	Type of Development	Noise Abatement Category and Criterion (dBA)	Date	Time	Leq (dBA)	L(1) (dBA)	L(10) (dBA)	L(50) (dBA)	L(90) (dBA)	Existing Worst Hour Noise Level, Leq(hr) (dBA)
ST-1	South End of the Lazy J Trailer Ranch ~ 34 meters from the Center of the Near Northbound Travel Lane of Highway 101. (1st Row Receiver)	Residential	B(67)	6/10/2003	16:40	66.3	78.4	66.9	62.8	57.9	**65**
					16:50	64.7	75.4	67.2	62.2	56.1	
					17:00	66.7	75.7	69.7	64.3	60.3	
ST-2	South End of the Lazy J Trailer Ranch ~ 48 meters from the Center of the Near Northbound Travel Lane of Highway 101. (2nd Row Receiver)	Residential	B(67)	6/10/2003	17:16	60.5	67.6	62.8	59.8	56.7	**62**
					17:20	58.3	64.8	61	57.5	51.1	
					17:30	58.8	66.7	61.6	57.6	52.2	
ST-3	North End of the Lazy J Trailer Ranch ~ 46 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Residential	B(67)	6/10/2003	17:45	61.6	67.2	64.4	61.1	53.8	**65**
					17:50	61.5	67.2	64.4	61	54.3	
					18:00	60.7	68	63.7	59.3	54.1	
ST-4	North End of the Lazy J Trailer Ranch ~ 67 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Residential	B(67)	6/10/2003	18:10	56.8	62.9	59.6	55.9	50.9	**62**
ST-5	Eureka KOA Hike/Bike Camps ~ 162 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Residential	B(67)	6/11/2003	11:50	53	58	55.2	52.7	49	**53**
					12:00	52.4	57	54.6	51.9	49.2	
					12:10	53.4	59.5	55.7	52.5	49.8	

***** Traffic noise levels are listed in six table headings as follows:

L(eq) = Average noise level during the time measurement period

L(1) = Highest noise levels exceeding the level shown 1% of the time. For example, at Site ST-1 at 16:40, the L(1) = 78.4 dBA, which indicates noise levels exceeded 78.4 dBA 1% of the time

L(10) = Highest noise level exceeding the level shown 10% of the time

L(50) = Highest noise level exceeding the level shown 50% of the time

L(90) = Highest noise level exceeding the level shown 90% of time

Leq(hr) = Average noise level during the worst hour (i.e. the highest average noise level occurs during the period of highest traffic volumes)

Long-term noise measurements were conducted to show the trend in both 10-minute and hourly traffic noise levels throughout a 24–hour period. Care was taken to select sites that were primarily affected by noise from Route 101 and to avoid sites in which noise contamination from sources other than the roadway may occur. During the noise monitoring survey, construction was occurring in close proximity to the long-term noise measurement chosen to represent the noise environment of the Lazy J Trailer Ranch. Additionally, the KOA campground is located adjacent to a small lumber mill, and noise generated by these sources contributed substantially at times to the measured noise levels. The noise data collected at both long-term noise measurement sites was reviewed carefully to exclude these noise sources.

Short-term noise measurements were conducted simultaneous with traffic counts at five locations throughout the study area in ten-minute intervals. Measurements were repeated several times at some locations to confirm traffic noise levels or assess variability due to noise sources other than adjacent highways. Short-term noise measurements were conducted outdoors at areas of frequent human activity or at acoustically equivalent locations. The microphones were located approximately 1.5-meter (five-feet) above the surrounding ground and at least 3.0-m (9.8-feet) from structures. Peak hour noise levels at each receiver were calculated by adjusting for differences in traffic conditions during measurements and the loudest existing hourly traffic conditions. The adjusted peak-hour noise levels were compared to trends measured at nearby long-term noise measurement locations.

Noise measurement locations are used as noise modeling receivers for prediction of future noise levels.

ENVIRONMENTAL CONSEQUENCES

Traffic Noise Level Prediction

The traffic model predicted the existing, future no-project, and future with project alternatives highest traffic noise levels. Traffic volume inputs into the traffic noise model were taken from the project traffic projections. Traffic noise levels were calculated for existing peak traffic hour conditions and future build conditions for year 2031 (Alternatives 1, 2, and 3).

The noisiest hour is not necessarily the hour with peak traffic volumes. Congestion results in slower speeds, which substantially reduces noise levels. The loudest hour is typically an hour where traffic flows freely at or near capacity conditions.

Traffic mix was based on the average of traffic counts reported in the *2001 Annual Average Daily Truck Traffic on the California State Highway System* report (Caltrans, December 2002). The existing and future traffic mix was applied to the counted and projected volumes and was modeled as follows:

96% Light-Duty Autos
2% Medium-Duty Trucks
3% Heavy-Duty Trucks

Free-flow traffic speeds observed in the field during the noise monitoring survey were approximately 50-mph for light-duty vehicles and medium-duty and heavy-duty trucks. In the project vicinity, a safety corridor has been established, the posted 50-mph speed limit is clearly posted, and radar is used to display vehicle speeds to drivers. Based on observations and pacing of vehicles in the project vicinity, the posted speed limit is generally adhered to. Under Alternative 1, the posted speed limit would be raised to 60-mph because motorist safety would be improved. The posted speed limit would be 65-mph under Alternative 2. For the purposes of traffic noise modeling for future year conditions under Alternative 3, light-duty vehicles and trucks were modeled at a speed of 50-mph. Peak-hour traffic directionality data was not available, so an equal northbound and southbound split was assumed.

This section discusses the results of noise modeling for future build conditions (Alternatives 1, 2, and 3). As previously mentioned, Alternative 7, the No-Build Alternative would not result in noise impacts and is not a Type I project.

Future Noise Environment, Impacts

Noise prediction modeling of future year (2031) traffic conditions predicts noise levels would increase with the project by up to five dBA at Category B receivers in the study area with the project. (See Table 3-22) Residence locations at the first- and second-row (in relation to Route 101) of the Lazy J Trailer Ranch would approach or exceed the FHWA Noise Abatement Criteria (66 dBA for residential or Category B areas). Receivers at the Eureka KOA campground would not approach or exceed the NAC. The project would not result in a substantial noise increase (12 dBA or more) at identified Category B uses in the study area.

The residents at the Lazy J Trailer Ranch on Jacobs Avenue are located on the northbound side of Route 101 west of Airport Road. First row residences are primarily affected by noise generated by Route 101, but traffic noise generated by Jacobs Avenue and aircraft associated with Murray Field also contribute to the noise environment at these receivers. Receivers are located at elevations approximately 2.4 m below Route 101.

Alternative 1. Alternative 1 would close all median crossings and increase travel speeds to 60 mph in the vicinity of Airport Road. Future noise level increases under Alternative 1 are predicted to be up to 4 dBA above existing levels as a result of the anticipated increase in traffic and increased travel speeds. First row receivers would have future noise levels from Route 101 traffic ranging from 68 to 69 dBA $L_{eq[h]}$. Future project noise levels are predicted to be about 66 to 68 dBA $L_{eq[h]}$ at second-tier

receivers at the mobile home park, and approximately 61 to 62 dBA $L_{eq[h]}$ at third-tier receivers. Only first- and second-tier receivers would be considered noise impacted as future noise levels would approach or exceed the NAC.

Alternative 2. Alternative 2 would close all median crossings and increase travel speeds to 105 kph (65 mph) in the vicinity of Airport Road. Future noise level increases under Alternative 2 are predicted to be up to five dBA above existing levels because of the anticipated increase in traffic and increased travel speeds. First row receivers would have future noise levels from of Route 101 traffic ranging from 69 to 71 dBA $L_{eq[h]}$. Future project noise levels are predicted to be about 67 to 69 dBA $L_{eq[h]}$ at second-tier receivers at the mobile home park, and approximately 62 to 63 dBA $L_{eq[h]}$ at third-tier receivers. Only first- and second-tier receivers would be considered noise impacted as future noise levels would approach or exceed the NAC.

Alternative 3. Alternative 3 would close all median crossings and construct a third northbound lane between Cole Avenue and Mid-City Motors. A signalized intersection would also be constructed at Airport Road. Travel speeds in the vicinity of Airport Road would be 80 kph (50 mph). Future noise levels would increase by up to 2 dBA above existing levels under Alternative 3 because of the anticipated increase in traffic, changes in roadway geometry, and the signalized intersection. First-tier receivers would have future noise levels because of U.S. 101 traffic ranging from 66 to 68 dBA $L_{eq[h]}$. Future project noise levels are predicted to be 64 dBA $L_{eq[h]}$ at second-tier receivers at the mobile home park, and approximately 59 to 60 dBA $L_{eq[h]}$ at third-tier receivers. Only first tier receivers would be considered noise impacted as future noise levels would approach or exceed the NAC.

Alternative 7. Alternative 7 would not change the alignment of the Highway or increase travel speeds in the vicinity of Airport Road. Traffic noise modeling was not performed and noise abatement was not considered.

Eureka KOA Campground

Receivers at the Eureka KOA campground are located approximately 155 meters from the center of the near northbound Route 101 travel lane. Receivers within the campground are located at elevations up to 5 meters above the roadway. Future noise level increases with the project (Alternatives 1, 2, and 3) are predicted to be up to 4 dBA above existing levels. Receivers at the KOA would have future noise levels ranging from 57 to 64 dBA $L_{eq[h]}$. Receivers would not be considered noise impacted as future noise levels would not approach or exceed the NAC under any of the project alternatives and future noise levels increases would not be substantial.

Table 3-22
Noise Modeling Results

Location	Description	Development Predates 1978? (Yes or No)	Existing PM Peak Leq(hr)	Alternative 1 2031 PM Peak Leq(hr)	Alternative 2 2031 PM Peak Leq(hr)	Alternative 3/6 2031 PM Peak Leq(hr)	2031 Project Noise Increase (+) or Decrease (-)	Impact Type (S, A/E, or NONE)
ST-3	South End of the Lazy J Trailer Ranch ~ 34 meters from the Center of the Near Northbound Travel Lane of Highway 101. (1st Row Receiver)	Yes	**67**	**68**	**69**	**66**	(-1) to 2	**A/E**
ST-4	South End of the Lazy J Trailer Ranch ~ 48 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Yes	63	**68**	**69**	**64**	1 to 4	**A/E**
ST-5	North End of the Lazy J Trailer Ranch ~ 46 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Yes	66	**69**	**70**	**67**	1 to 4	**A/E**
ST-6	North End of the Lazy J Trailer Ranch ~ 67 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Yes	62	**66**	**67**	64	2 to 5	**A/E**
R-1	Lazy J Trailer Ranch - 1st Row Center	Yes	**67**	**69**	**71**	**68**	1 to 4	**A/E**
R-2	Lazy J Trailer Ranch - 2nd Row Center	Yes	64	**66**	**68**	64	0 to 4	**A/E**
R-3	Lazy J Trailer Ranch - 3rd Row South	Yes	61	62	63	60	(-1) to 2	NONE
R-4	Lazy J Trailer Ranch - 3rd Row Center	Yes	62	62	63	60	(-2) to 1	NONE
R-5	Lazy J Trailer Ranch - 3rd Row North	Yes	61	61	62	59	(-2) to 1	NONE
ST-8	Eureka KOA Hike/Bike Camps ~ 162 meters from the Center of the Near Northbound Travel Lane of Highway 101.	Yes	53	57	57	55	4	NONE
Impact Type	S = Substantial Increase (12 dBA or more)							
	A/E = Approach or Exceed NAC							
BOLD font indicates noise impact per FHWA/Caltrans Noise Policy under identified scenario.								

Construction Noise

Construction activities associated with the Eureka-Arcata Corridor Improvement Project would occur under the Build Alternatives. Alternative 7 is the No Build alternative. Under the No Build alternative, none of the project features would be constructed.

Activity from construction would increase noise levels at locations immediately adjacent to the project where major construction occurs. The majority of construction would occur near the Indianola Cutoff under Alternative 2. There were no sensitive receivers identified in the vicinity of the Indianola Cutoff during the noise monitoring survey. Table 3-23 summarizes typical noise levels generated by construction equipment at a distance of 15 meters or 50 feet. Detailed construction techniques are not yet available. Some construction activities, such as pile driving, have the potential to generate very high noise levels. Noise generated by construction equipment drops off at a rate of 6 dB per doubling of distance. With the implementation of Caltrans' standard construction practices, no adverse impacts from construction noise are anticipated.

TABLE 3-23
Construction Equipment Noise

Type of Construction Equipment	Maximum Level, dBA at 15 meters
Scrapers	89
Bulldozers	85
Heavy trucks	88
Backhoe	80
Pneumatic tools	85
Concrete Pump	82
Impact Pile Driver	95 to 105
Source: NCHRP, 1999	

Construction Noise Impacts to Wildlife

Noise levels generated by construction are discussed in Section 8.1. Construction noise levels that may affect wildlife are described based on average or Leq and maximum noise levels. Construction areas would be adjacent to Route 101, which would be operational through the construction period. Near roadways, Leq noise levels drop off at a rate of about three to five dBA per doubling of distance. Maximum noise levels, such as those from trucks or motorcycles, drop off at a rate of about six dBA per doubling of distance. Noise levels from construction activities would drop off at a rate of about six dBA per doubling of distance. Ground absorption, noise shielding features and atmospheric conditions could result in higher drop off rates. With the implementation of Caltrans standard construction practices, no adverse impacts to wildlife are anticipated.

Off-Site Noise Effects

According to the traffic report for this project, the three Build Alternatives would increase future traffic volumes along Old Arcata Road, Myrtle Avenue, and the Indianola Cut-off over the predicted future no-build scenario (Alternative 7). Existing traffic conditions along these roadways were not available. To evaluate the noise impacts resulting from the Build Alternatives, a comparison of future No-Build Alternative conditions and future project conditions was made. The traffic modeling

forecasts indicate Alternative 1 would increase traffic volumes along Old Arcata Road approximately 49% over the traffic volumes estimated under Alternative 3. Alternative 2 would increase traffic volumes approximately 6% over Alternative 3.

Residences are located along Old Arcata Road, Myrtle Avenue, and the Indianola Cut-off. A noise measurement survey was conducted to document existing noise conditions at representative noise receivers along these roadways and serve as a baseline to predict future noise level increases associated with the project. Noise measurements were conducted at five locations along these roadways to quantify existing noise levels generated by vehicular traffic. Table 3-24 summarizes the results of these noise measurements.

The estimated noise level increases resulting from Alternatives 1, 2, and 3 of the proposed project on Old Arcata Road, Myrtle Avenue, Indianola Cut-off, and Indianola Road were calculated relative to Alternative 7 (year 2031 No-Build). Where noise levels would increase substantially, a significant noise impact would be identified. Currently, Caltrans defines a substantial increase as 12 dBA Leq[hr] or greater. Future traffic noise levels would increase by 0 to 4 dBA under Alternative 1 when compared to the levels predicted for the future no-build scenario. Alternatives 2 and 3 would generate noise levels 0 to 2 dBA higher than future No-Build Alternative conditions. The changes to noise levels associated with the project (Alternatives 1, 2, or 3) would not be considered substantial when compared with future no build conditions.

Table 3-24
Off-Site Existing Noise Levels

Site	Location	Type of Development	Noise Abatement Category & Criterion (dBA)	Date	Time	Leq	L(1)	L(10)	L(50)	L(90)	Existing Worst Hour Noise Level, Leq(hr) (dBA)
LT-3	Old Arcata Road North of the Bayside Cut-off ~ 20 meters from the Center of the Near Lane.	Residential	B(67)	6/10/03 to 6/11/03	14:00 to 14:00	--	--	--	--	--	**66**
LT-4	Myrtle Avenue at Rocky Creek Road ~ 30 meters from the Center of the Near Lane.	Residential	B(67)	6/10/03 to 6/11/03	14:00 to 14:00	--	--	--	--	--	**62**
ST-1	Indianola Cut-off west of Indianola Road ~ 25 meters from the Center of the Roadway.	Residential	B(67)	6/10/2003	15:30	62.6	72.1	67.2	53.8	43.6	**65**
ST-2	Indianola Road north of Indianola Cut-off ~ 20 meters from the Center of the Roadway.	Residential	B(67)	6/10/2003	15:50	47.2	59.1	47.8	43.2	37.7	**50**
ST-7	Old Arcata Road at Golf Course Road ~ 30 meters from the Center of the Old Arcata Road.	Residential	B(67)	6/11/2003	10:00	61.1	70.6	66	52.2	39.8	**64**
					10:10	62.1	71	66.8	55.6	43.8	**65**

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Preliminary Noise Abatement Analysis

The primary noise impacts associated with the project would result from the increase in travel speed along the corridor and additional traffic (not as a result of the project). Substantial noise impacts would not occur at Category B uses along the corridor, but receivers within the Lazy J Trailer Ranch would experience future noise levels that would approach or exceed the NAC. As a result, noise abatement must be evaluated for these receivers.

Under Caltrans and FHWA policies, feasible noise barriers must provide a minimum five-dBA reduction in traffic noise. Furthermore, under Caltrans policies, noise barriers should interrupt the line of sight between a truck stack (of average height) and a receiver. Chapter 1100 of the Caltrans Highway Design Manual identifies particular design guidelines that must be met for noise barriers, depending on roadway conditions. Under these guidelines, the height of noise barriers is limited to 4.9 m (16 feet), unless constructed within 4.5 m (15 feet) of the traveled way where the limit is 4.2 m (14 feet). The most acoustically effective location for a barrier where roadways are elevated above receivers is near the edge of shoulder or top of slope. In this case, the barrier would be located within 4.5 m (15 feet) of the traveled way, and therefore, would be limited to a maximum height of 4.2 m (14 feet).

A sound wall located along the northbound side of the Route 101 could be feasible (i.e., reduce noise levels by five dBA and block line of sight to heavy-duty truck stacks in the near travel lane). This sound wall would benefit approximately twelve to eighteen residences in the adjacent mobile home park depending upon the selected barrier height. Since the elevation of Route 101 is above these residences, the sound wall would need to be located at the edge of the highway shoulder. The approximate length of this noise barrier would be about 180-m (590-feet). See Figure 3-23, which includes a possible sound wall location.

A 3.0-m (ten-feet) barrier would reduce noise levels by five to eight dBA at about twelve receivers and block line-of-sight to truck exhaust stacks. This would be the minimum height of a feasible sound wall to benefit all impacted receivers. A 3.6-m (twelve feet) noise barrier would benefit approximately eighteen receivers, providing approximately five to nine dBA of noise reduction. A 4.2-m (fourteen feet) noise barrier would benefit approximately 18 receivers, reducing noise levels by six to ten dBA. See Table 3-25.

Table 3-25
Noise Level Reduction with Soundwall

	Alt. 1													
Location	2031 Project PM Peak Leq(hr)	Noise Barrier ID or Location	1.8 m Barrier	2.4 m Barrier	3.0 m Barrier	3.6 m Barrier	4.2 m Barrier	4.8 m Barrier	1.8 m Barrier I.L.	2.4 m Barrier I.L.	3.0 m Barrier I.L.	3.6 m Barrier I.L.	4.2 m Barrier I.L.	4.8 m Barrier I.L.
ST-3	68	SW1	64	63	61	60	60	--	4	5	7	8	8	--
ST-4	66	SW1	60	60	59	57	56	--	6	6	7	9	10	--
ST-5	69	SW1	64	64	63	61	61	--	5	5	6	8	8	--
ST-6	66	SW1	62	62	61	60	59	--	4	4	5	6	7	--
R-1	69	SW1	64	63	61	61	60	--	5	6	8	8	9	--
R-2	66	SW1	61	60	60	58	57	--	5	6	6	8	9	--
R-3	62	SW1	59	58	58	56	55	--	3	4	4	6	7	--
R-4	62	SW1	59	58	58	57	56	--	3	4	4	5	6	--
R-5	61	SW1	59	57	57	55	54	--	2	4	4	6	7	--
	Alt. 2													
Location	2031 Project PM Peak Leq(hr)	Noise Barrier ID or Location	1.8 m Barrier	2.4 m Barrier	3.0 m Barrier	3.6 m Barrier	4.2 m Barrier	4.8 m Barrier	1.8 m Barrier I.L.	2.4 m Barrier I.L.	3.0 m Barrier I.L.	3.6 m Barrier I.L.	4.2 m Barrier I.L.	4.8 m Barrier I.L.
ST-3	69	SW1	65	64	62	61	61	--	4	5	7	8	8	--
ST-4	67	SW1	61	61	60	58	57	--	6	6	7	9	10	--
ST-5	70	SW1	65	65	64	62	62	--	5	5	6	8	8	--
ST-6	67	SW1	63	63	62	61	60	--	4	4	5	6	7	--
R-1	71	SW1	66	65	63	63	62	--	5	6	8	8	9	--
R-2	68	SW1	63	62	62	60	59	--	5	6	6	8	9	--
R-3	63	SW1	60	59	59	57	56	--	3	4	4	6	7	--
R-4	63	SW1	60	59	59	58	57	--	3	4	4	5	6	--
R-5	62	SW1	60	58	58	56	55	--	2	4	4	6	7	--
	Alt. 3 and 6													
Location	2031 Project PM Peak Leq(hr)	Noise Barrier ID or Location	1.8 m Barrier	2.4 m Barrier	3.0 m Barrier	3.6 m Barrier	4.2 m Barrier	4.8 m Barrier	1.8 m Barrier I.L.	2.4 m Barrier I.L.	3.0 m Barrier I.L.	3.6 m Barrier I.L.	4.2 m Barrier I.L.	4.8 m Barrier I.L.
ST-3	66	SW1	62	61	59	58	58	--	4	5	7	8	8	--
ST-4	64	SW1	58	58	57	55	54	--	6	6	7	9	10	--
ST-5	67	SW1	62	62	61	59	59	--	5	5	6	8	8	--
ST-6	64	SW1	60	60	59	58	57	--	4	4	5	6	7	--
R-1	68	SW1	63	62	60	60	59	--	5	6	8	8	9	--
R-2	64	SW1	59	58	58	56	55	--	5	6	6	8	9	--
R-3	60	SW1	57	56	56	54	53	--	3	4	4	6	7	--
R-4	60	SW1	57	56	56	55	54	--	3	4	4	5	6	--
R-5	59	SW1	57	55	55	53	52	--	2	4	4	6	7	--
Notes:	Noise barriers should not exceed 4.3 m in height when located 4.5 m or less from the edge of the traveled way,													
	and should not exceed 5.0 m in height above the ground line when located more than 4.5 from the traveled way.													
	I.L = Barrier insertion loss or noise level reduction due to a barrier.													

Pursuant to Caltrans and FHWA sound wall policies, a sound wall was determined to be feasible at this location. However, local landowners need to be in agreement with constructing a sound wall. In this case, the property owner of the Lazy J Trailer Ranch, in a personal communication on October 4, 2006 was not in favor of the sound wall (shown in Figure 3-23). Consequently, the sound wall has been dropped from further consideration.

Since construction noise is not expected to be adverse, mitigation for construction noise is not required.

3.2.7 Energy

This section is summarized from an energy report finalized in August 2006. This report is available for public review at the Caltrans District 1 office in Eureka. Please call Mitchell Higa at 707-441-5855 in advance to set an appointment to review this study.

REGULATORY SETTING

The CEQA Guidelines, Appendix F, Energy Conservation, state that Environmental Impact Reports are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

National Environmental Policy Act (42 USC Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

AFFECTED ENVIRONMENT

In California, the vast majority of energy consumed originates from nonrenewable sources. Approximately sixty percent of the State's energy is derived from petroleum; while 27 percent is from natural gas; ten percent from hydroelectric, geothermal, nuclear, and other sources; and three percent from coal. Of all the energy consumed, 48 percent is used for transportation, 31 percent for industrial use, twelve percent for residential use, and nine percent for commercial use (CEC 1993). These statistics show that the consumption of petroleum for transportation is the primary use of nonrenewable energy in the state.

One of the focuses on conservation of energy has, therefore, been on reducing the energy consumed by transportation, primarily automobile traffic. Conservation objectives have included improving the efficiency of the transportation mode, such as the United States Environmental Protection Agency (EPA) fleet requirements for improving fuel efficiency of personal automobiles. Other conservation strategies

include encouragement of high-occupancy vehicle use, improved road construction and maintenance, and traffic flow improvements.

An energy analysis was prepared pursuant to 40 CFR 1502.16(e) of the National Environmental Policy Act (NEPA) Guidelines and California Environmental Quality Act (CEQA) Guidelines. NEPA Guidelines state that the Environmental Impact Statement shall include a discussion of "energy requirements and conservation potential of various alternatives." Appendix F of the CEQA Guidelines states that in Environmental Impact Reports, "alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient, and unnecessary consumption of energy."

ENVIRONMENTAL CONSEQUENCES

An assessment of energy use in the project area was performed to compare the influence that the proposed project would have on the transportation energy requirements and construction energy requirements for the Eureka to Arcata Route 101 Corridor Improvement Project. The corridor analyzed for this study incorporates Route 101 between Eureka and Arcata; Old Arcata Road/Samoa Boulevard/Myrtle Avenue, from its intersection with Route 101 in Arcata, south to West Avenue in Eureka; Indianola Cutoff between Route 101 and Old Arcata Road; and State Route 255 between its intersection with Route 101 in Arcata and its intersection with Route 101 in Eureka. In the year 2031, the vehicular use of the proposed project would result in an increase in localized energy consumption in the proposed project corridor under Alternatives 1, 2, and 3. Construction of all of the Build Alternatives would contribute to a temporary, one time use of energy.

Table 3-26 presents the estimated energy usages in the proposed project corridor based on approximated vehicle miles traveled (VMT) values for the year 2031 for project Alternatives 1, 2, and 3. The approximated VMT values were based on year 2031 projected average daily traffic volumes of several roadway segments in the project corridor and estimated distances of roadway segments. A conversion factor was used to convert the VMT value to a British Thermal Unit (BTU) energy value. As shown in Table 3-26, the percentage difference between the Build Alternatives and the No Build Alternative vary as follows:

- Alternative 1 would result in a thirteen percent increase in daily energy usage because of out-of-direction travel resulting from median access closures.

- Alternative 2 would result in a six percent increase in daily energy usage; this alternative is similar to Alternative 1, except the inclusion of a new interchange would reduce out-of-direction travel.

- Energy usage modeling results indicate that Alternative 3 could result in a two percent decrease in daily energy usage compared to the No Build Alternative

in year 2031. In the year 2031, traffic delay resulting from left-turn movements at Route 101 intersections are expected to increase and cause a percentage of traffic to divert to alternate routes thereby increasing travel and energy consumption. Because Alternative 3 includes an interchange and maintains access at one of the busiest intersections (Airport Road), this alternative could actually lessen out-of-direction travel, thereby slightly decreasing the energy usage compared to the existing Route 101 highway.

Table 3-26
Project Energy Use

		2031 Build Alternative 1				2031 Build Alternative 2			
Roadway Segment	**Distance (miles)**	**Average Daily Traffic Volumes (ADT)/day**	**Vehicle Miles Traveled (VMT)/day**	**Energy (Btu)/day**	**Gas Us-age/day**	**ADT/day**	**VMT/day**	**Energy (Btu)/day**	**Gas Us-age/day**
Route 101 North of Bayside Rd. to India-nola Cutoff	1.9	55,865	106,144	660,849,431	5,727	54,238	103,052	641,602,997	5,560
Route 101 Between Indianola Cutoff and Cole Ave	2.4	57,550	138,120	859,935,120	7,452	58,323	139,975	871,485,595	7,552
Route 255 Between 5th and Lupin Dr.	3.9	9,877	38,520	239,827,388	2,078	10,005	39,020	242,935,407	2,105
Route 255 between Lupin Dr. and 101 in Arcata	4.9	23,975	117,478	731,414,915	6,338	23,838	116,806	727,235,401	6,302
Old Arcata Rd. Between Route 101 and India-nola Cutoff	4.9	10,372	50,823	316,422,753	2,742	7,738	37,916	236,066,261	2,046
Old Arcata Rd. between Indianola Cutoff and Myrtletown	5.8	7,951	46,116	287,116,971	2,488	5,098	29,568	184,092,858	1,595
Myrtle Ave between Myrtletown and West Ave.	1.2	20,466	24,559	152,905,579	1,325	18,196	21,835	135,945,955	1,178
Indianola Cutoff	0.8	4,783	3,826	23,823,166	206	4,548	3,638	22,652,678	196
Totals	**25.8**		**525,586**	**3,272,295,323**	**28,356**		**491,811**	**3,062,017,154**	**26,534**

Table 3-26
Project Energy Use (Continued)

		2031 Build Alternative 3			
Roadway Segment	**Distance (miles)**	**ADT/day**	**VMT/day**	**Energy (Btu)/day**	**Gas Usage/day**
Route 101 North of Bayside Rd. to Indianola Cutoff	1.9	51,628	98,093	610,728,263	5,292
Route 101 Between Indianola Cutoff and Cole Ave	2.4	53,951	129,482	806,157,422	6,986
Route 255 Between 5th and Lupin Dr.	3.9	8,831	34,441	214,429,043	1,858
Route 255 between Lupin Dr. and 101 in Arcata	4.9	22,756	111,504	694,226,394	6,016
Old Arcata Rd. Between Route 101 and Indianola Cutoff	4.9	7,003	34,315	213,643,322	1,851
Old Arcata Rd. between Indianola Cutoff and Myrtletown	5.8	3,815	22,127	137,762,702	1,194
Myrtle Ave between Myrtletown and West Ave.	1.2	17,177	20,612	128,332,802	1,112
Indianola Cutoff	0.8	3,171	2,537	15,794,117	137
Totals	**25.8**		**453,112**	**2,821,074,067**	**24,446**

A rough conversion of BTU values to gallons of fuel can be performed by using the factor of 115,400 BTU/gallon. The difference in fuel consumption per day between the Build Alternatives and the No-Build Alternative are as follows:

- Alternative 1 would result in an increase of approximately 12,511 liters or 3,305 gallons per day
- Alternative 2 would result in an increase of approximately 5,613 liters or 1,483 gallons per day
- Alternative 3 would result in a decrease of approximately 2,290 liters or 605 gallons per day

For the proposed project, an adverse impact for energy consumption would occur if a project alternative would result in an increase in energy consumption over the No-Build Alternative or if a project alternative would result in a wasteful, inefficient, and

unnecessary consumption of energy. The increase in energy consumption under Alternatives 1 and 2 over the No-Build Alternative would be considered an adverse impact. Alternative 1 would result in a greater impact than Alternative 2. However, none of the proposed project Build Alternatives would result in wasteful, inefficient, or unnecessary uses of energy. The proposed project alternatives are primarily needed for traffic safety improvement; traffic operation; and long-term roadway maintenance along Route 101. Therefore, this would not be a substantial impact.

Construction Energy

Construction of the proposed project would require the expenditure of energy for building the proposed project, manufacturing the materials used in construction, and transporting these materials to the construction area. The energy requirements for construction of Alternative 1, Alternative 2, and Alternative 3 were calculated based on the guidelines provided in the *Energy and Transportation Systems* Caltrans report. The "input-output" method, described in the *Energy and Transportation Systems* report, would be the most appropriate method to conduct these analyzes. The estimated monetary cost of construction for Alternatives 1, 2, and 3 serve as the necessary input for estimating construction energy usage. Based on construction cost estimates, Build Alternative 3 would result in the most energy used of the proposed project alternatives. Alternative 2 would be 1.2 times less than Alternative 3. The construction of Alternative 1 would require 166 times less energy than Alternative 3. The construction of the proposed project would be a necessary component of the project and a one-time expenditure of energy. In addition, the operation of the proposed project would not result in a wasteful, inefficient, and unnecessary use of energy. Therefore, construction energy impacts would not be adverse.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

A measure to reduce energy consumption for the proposed Build Alternatives would be to expand mass transit options along Route 101 between Eureka and Arcata. The concept was discussed for this project corridor in the Caltrans Value Analysis Report (VAR) as Alternative 3.0. According to the VAR, expanding mass transit would result in a reduction in energy use in this corridor. The VAR discusses several difficulties that would exist and must be overcome for this mitigation to be realized. These difficulties include establishing political support, agency support, public support, and business support to introduce disincentives for use of single occupancy vehicles in this corridor and incentives for users of public transit. State funding would be required to acquire buses, expand facilities, and meet the increased mass transit operation costs. There would be environmental impacts for constructing parking lots, for constructing parking structures, and from the expansion of mass transit facilities. General Plans for Humboldt County and the local municipalities would need to include Land Use Elements that promote land-use patterns that encourage mass transit use. Caltrans cannot guarantee the feasibility and/or

implementation of this measure, because this measure requires effort by other jurisdictions that may decide against implementing the necessary steps required to realize this measure. Additionally, it is not known if this measure would fully offset energy effects under either of the Build Alternatives because the level of success of this measure would be unknown until implementation. Therefore, this measure would not be feasible.

3.3 Biological Environment

The Biological Environment section of the EIR/S is broken into the following subsections and discussed individually:

Natural Communities
Wetlands and Other Waters
Plant Species
Animal Species
Threatened & Endangered Species
Invasive Species

This section consists of summaries from the January 2007 Natural Environment Study and the October 2006 draft Conceptual Wetland Mitigation Plan.

3.3.1 Natural Communities

REGULATORY SETTING

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, fish passage, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in the Threatened and Endangered Species Section 3.3.5. Wetlands and other waters are discussed in Section 3.3.2.

AFFECTED ENVIRONMENT

The Biological Study Area (BSA) consists of the existing railroad west of Route 101 and the watercourses east of Route 101. The southern study limit is the Eureka Slough and northern study limit is the 11th Street overcrossing structure in Arcata.

(See Plan Sheets in Appendix A.) The study area is expected to encompass all potential temporary and permanent project effects.

In addition to the habitats within the study area, there are regional habitats of concern in the vicinity of the study area. Eelgrass beds, one of the three largest stands on the West Coast, occur in the intertidal mud flats of Arcata and Humboldt Bay. These eelgrass beds are important habitat for fish and invertebrates and influence the sedimentary regime in the bay. Northern coastal dune communities occur on the western side of Arcata and Humboldt Bay, willow swamps occur on both sides of the bay, and forest communities (riparian, mixed, and coniferous) occur on the eastern side of Arcata and Humboldt Bay.

Four designated wildlife areas and refuges located adjacent to, or within the BSA (see Plan Sheets in Appendix A):

- Humboldt Bay National Wildlife Refuge is managed by U.S. Fish and Wildlife Service and is located along the Humboldt Bay shoreline west of Route 101 between Eureka and Arcata;

- Fay Slough Wildlife Area is managed by the California Department of Fish and Game (CDFG) and is located between Indianola Cutoff and Airport Road east of Route 101;

- Eureka Slough Wildlife Area is also managed by CDFG and is located at the western end of Jacobs Drive on the eastern side of Route 101.

- Bracut Marsh was established by the Redwood Community Action Agency. This marsh is located west of Route 101 and north of the Bracut businesses.

These wildlife areas provide wetland habitat, including marshes, seasonal wetlands, salt marshes, tidal bay mudflats and open water for thousands of migratory birds along the Pacific flyway (a north-south migratory corridor).

Surveys and Studies Conducted

A site survey of the BSA from Eureka Slough to Bayside Cutoff was completed by a Caltrans consultant from May 21 to 23, 2003 and July 2 to 4, 2003. The survey covered the entire BSA by walking slowly and recording habitat types, plant and animal species present, and environmental conditions. The area included the shoulder of the southbound and northbound lanes of the Route 101 right-of-way and the highway medians. The BSA was revised in 2004 and an additional survey by the consultant was conducted in August 4, 2005. The BSA was revised a second time in 2005. Caltrans Biologist Gail Popham surveyed the section from the Bayside Cutoff north to the 11th Street overcrossing in the winter of 2005-2006 and again in the spring and summer of 2006.

The dominant habitat in the BSA consists of mostly non-native grasses located along the Route 101 shoulders and in portions of the median that are not Estuarine Intertidal Wetland. An approximately three-meter or ten-foot wide area is mowed every spring and fall along the Route 101 shoulders and on both sides of the median. Dominant species in the ruderal grassland habitat include non-native species such as scarlet pimpernel (*Anagallis arvensis*), black mustard (*Brassica nigra*), fennel (*Foeniculum* vulgare), wild radish *(Raphanus sativus*), perennial trefoil (*Lotus corniculatus*), dandelion (*Taraxacum officinale*), and narrowleaf plantain (*Plantago lanceolata*). Other non-native plant species that occur in the BSA include Himalayan blackberry (*Rubus discolor*), pampas grass (*Cortaderia jubata*) and curly dock (*Rumex crispus*).

The Humboldt Bay area provides habitat for a large diversity of native aquatic and terrestrial animal species. The BSA is dominated by Route 101 and thus does not provide diverse and abundant habitat for wildlife species. The median and edges of the highway are vegetated and considered to be marginal for most species due to its proximity to the highway. While the potential for most of these species to occur in the BSA is low, mammal species present in the vicinity include Roosevelt elk (*Cervus canadensis roosevelti*), black-tailed deer (*Odocoileus hemionus*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), river otter (*Lutra canadensis*), rodents, weasels, skunks, and bats. Bird species include waterfowl (e.g. ruddy duck), wading birds (e.g. great blue heron, egrets, sora rail, black crowned night heron), raptors (e.g. northern harrier), and songbirds (red-winged blackbird, marsh wren, savannah sparrow, barn swallow, cliff swallow).

Between Eureka and Arcata, Route 101 discourages most wildlife, other than fish and birds, from crossing between Humboldt Bay and the area east of Route 101. There are no highway segments within the project construction limits that have a high wildlife collision rate or encompass an established wildlife corridor.

Within the BSA, Jacoby Creek and Gannon Slough serve as migration corridors for fish, such as salmon, that move between salt and freshwater to complete their life history. The slough also potentially provides resting and feeding habitat for migratory waterfowl and shorebirds. The Route 101 slough on the east side of Route 101 immediately adjacent to the BSA is known to contain tidewater goby, may serve as a rearing area for salmonids, and provides feeding habitat for migratory waterfowl and shorebirds. The brackish waters of the sloughs and drainage ditches provide potential habitat for special status species such as coastal cutthroat trout, southern Oregon/Northern California Coho salmon, Northern California steelhead, California coastal Chinook salmon, and tidewater goby. Other fish species that were found from surveys conducted on August 31, 2006 in the watercourse east and parallel to Route and Gannon Slough include three-spine stickleback (*Gasterosteus acculeatus*), bay pipefish (*Sygnathus leptorhynchus*), mosquito fish (*Gambusia affinnis*), stag horn sculpin (*Leptocottus armatus*), and prickly sculpin (*Cottus asper*).

These regional communities of special concern provide potential habitat for a number of plant and animal species, which are discussed in sections 3.3.3, 3.3.4, and 3.3.5 in this chapter.

ENVIRONMENTAL CONSEQUENCES

Temporary and permanent impacts for the proposed project are expected to take place within the existing Route 101 highway right-of-way or within easements described in Chapter 2. Indirect effects such as noise may extend beyond the Route 101 Right-of-Way; those effects are addressed in Section 3.2.6 – Noise and in Section 3.3.5 – Threatened and Endangered Species of this chapter.

The effects of Alternatives 1, 2, and 3 to biological resources in the BSA would primarily be due to the loss of wetland habitat within the project footprint and impacts to special status fish species due to bridge construction work. Alternatives 2 and 3 would occupy a larger footprint than Alternative 1 and would therefore result in more habitat loss than Alternative 1. Alternative 3 would have a slightly larger footprint than Alternative 2. Alternative 7 would not result in any direct impacts to biological resources.

Bridge Construction Work at Jacoby Creek and Gannon Slough

At both Jacoby Creek and Gannon Slough, there is a pair of Route 101 bridges to accommodate traffic in both directions. Alternatives 1, 2, and 3 include widening the northbound Jacoby Creek and Gannon Slough Bridges and replacing the southbound Jacoby Creek Bridge. Pile driving required for the bridge construction work is discussed in Section 3.3.5 in this chapter. See Typical Section X-3 and Plan Sheets in Appendix A.

Widening of Northbound Bridges

The existing ten-meter (34-feet) wide northbound Jacoby Creek Bridge would be widened by about three-meters or ten-feet. The widening of this bridge would involve the placement of one or two additional 450-mm (1.5-feet) diameter cast in steel shell (CISS) piles in each pile line. There are four lines of piles supporting this bridge. Two lines are in the flowing channel and one line at each abutment. Two to four additional piles would be driven in the channel and two to four piles would also be driven on the banks for the abutments.

The existing 11-meter (36-feet) wide northbound Gannon Slough Bridge would be widened by about 1.8-meters (six-feet). The current bridge has five rows of piles. One pile line is centered in the middle of the channel, with a pile line on each bank, and one line for each abutment. There would be one 450-mm (1.5-feet) diameter

CISS pile added at each of the five pile lines (one in the middle of the channel, one on each side in the exposed channel, and one at each abutment).

After the piles are installed, falsework, forms, and reinforcing bar would be placed prior to pouring the concrete for the widened bridge deck. The placement of these superstructure elements may not involve the active channel.

Replacing the Southbound Jacoby Creek Bridge

The new southbound Jacoby Creek Bridge would be about 1.2-meters (four-feet) wider for a total width of about 13-meters (43-feet). The new bridge would also be a three span structure, with four pile lines of six piles each. Two pile lines would be in the active channel of Jacoby Creek (twelve piles total). Six piles would also be driven on each bank for the abutments. Piles would be one 450-mm (1.5-feet) diameter CISS, and driven up to thirty-meters (100-feet) below grade. The width of fill for the temporary median crossover lane would be up to eleven-meters (36-feet). The bridge replacement would involve the following:

- The existing bridge would be cut along its length and half of the existing bridge deck would be removed from above. Falsework or other measures would be employed to minimize the possibility of concrete debris falling in Jacoby Creek.

- Six of the existing piles (half of each pile line) would be removed to a depth of 300 to 600-mm (one to two feet) below grade and the voids backfilled with native material. Removal of old piles may require temporary stream diversion.

- Underwater construction noise attenuating methods may need to be implemented prior to the driving of the new piles in the Jacoby Creek channel. See Section 3.3.5 for more information.

- Augers would be used to remove soil from steel shells and then reinforcement bar and concrete would be added. The falsework, forms, and reinforcing bar would be placed prior to pouring the concrete for the new ½ -width bridge slab. The other half of the old bridge deck would be removed: falsework or other measures would be employed to minimize the possibility of concrete debris falling in Jacoby Creek. The six remaining old bridge piers would be removed.

- The temporary bridge falsework, concrete forms, and steel reinforcing would be placed prior to pouring the concrete for the rest of new bridge deck.

Bridge Construction Work Sequence and Traffic Detouring

First, the existing northbound Jacoby Creek and Gannon Slough Bridges would be widened prior to replacing the southbound Jacoby Creek Bridge. This work would be done by equipment staged on the shoulders so both lanes of Route 101 traffic could remain open. The northbound Jacoby Creek Bridge would be widened to temporarily accommodate a total of three lanes of traffic: two lanes of northbound and one temporary lane for southbound traffic. Once the northbound Jacoby Creek Bridge is widened and ready for a lane of southbound detour traffic from the southbound bridge, the demolition can begin on the southbound Jacoby Creek Bridge. The other lane of southbound traffic would stay on one side of the existing southbound Jacoby Creek Bridge, while the other half of the southbound bridge is removed and replaced. Then that lane of southbound traffic would be diverted to the new half-width southbound bridge while the second half of the bridge is replaced. After returning traffic to the replaced bridge, the temporary detour paving would be removed, and the fill material placed within the median would be removed and/or re-graded to conform to the existing bridge fill slopes. The northbound bridges would likely be widened the first year and the southbound Jacoby Creek Bridge replaced the following year.

Tide Gates

Existing tide gates on culverts that extend under the Route 101 roadway minimize tidal waters from inundating the surrounding pasturelands. (See Section 3.2.1 in this chapter for more information.) All of the existing tide gates within the project limits would be replaced. There are six locations with a total of nine tide gates. All of the present tide gates are the standard top hinged flap gate design, either round or rectangular. At the locations where fishes may be present, a “fish-friendly” tide gate with an auxiliary door would be installed. If there are fishes and more than one tide gate, only gates with an auxiliary door would be installed. The ditch parallel and on the east side of Route 101, Brainard Slough, Old Jacoby Creek, and Gannon Slough are locations where both special status tidewater gobies and salmonids may be present. (See Section 3.3.4 in this chapter for more information regarding special status fishes.) The gates with auxiliary doors are similar to the existing gates, with the added feature of a small manually adjustable auxiliary door that can remain open at all times. The small auxiliary door allows partial tidal flow in both directions. The fish-friendly tide gates were proposed by the U.S. Fish and Wildlife Service as mitigation for the proposed bridge construction work within the habitat of special status gobies and salmonids. See Figure 3-24.

The ditch that enters Eureka Slough south of Jacobs Avenue and the Simpson Sawmill ditch have no special status fishes present, so these replacement gates would not be the auxiliary door design. See Section 3.3.4 in this chapter for more information regarding special status fishes.

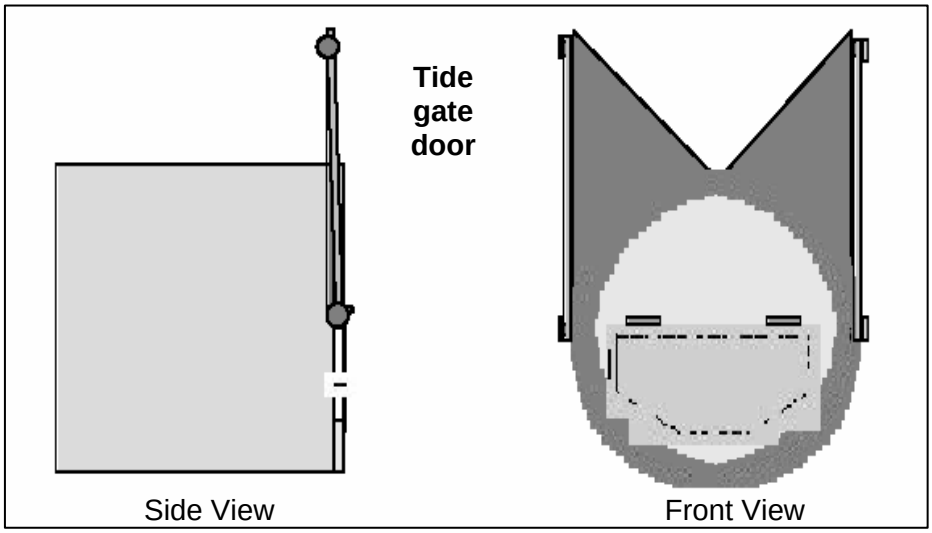


Figure 3-24
Proposed top-hinged tide gate with auxiliary door for fish passage

All replacement gates would make use of existing headwall structures. They would be installed at the same level as the existing gates. The tide gate work would generally consist of removing the existing tide gates and likely re-drilling and installing new stainless steel anchors epoxied into existing concrete. The new tide gates would generally be placed by cranes then bolted into place. There are existing access roads to each of the tide gate locations, with the exception of the 450-mm (1.5-feet) tide gate south of Jacobs Avenue, which controls drainage to the Eureka Slough. At this location the replacement work would likely be accessed by foot. Tide gate installation would not require ground disturbing activities or de-watering. Tide gate locations and replacements are summarized in Table 3-27.

Table 3-27: Tide Gate Replacement Summary
See Appendix A Plan Sheets for tide gate replacement locations

Location	Fish Species	Existing Gate(s)	Replacement Gate(s)
South of Jacobs Ave.	No fish present	1 – 450-mm (18”) round	1 – no auxiliary door
Route 101 slough	Tidewater Goby, Salmonids	2 – 1.5-meter (60”) square	1 – no auxiliary door 1 – w/ auxiliary door
Simpson mill ditch	No fish present	1 – 0.9-m x 1.21-m (36” x 48”) rectan-gular	1 – no auxiliary door
Brainard Slough	Tidewater Goby, Salmonids	1 – 600-mm (24”) round	1 - w/ auxiliary door
Old Jacoby Creek	Maybe tidewater goby	1 – 1.5-m (60”) square	1 – w/ auxiliary door
Gannon Slough*	Tidewater goby, Salmonids	3 – 1.5-m x 1.8-m (60” x 72”) rectan-gular	1 – w/auxiliary door 2 – no auxiliary door

*In August 2006 the City of Arcata installed a new gate with an auxiliary door at Gannon Slough adjacent to the existing Caltrans tide gates.

Extending Existing Acceleration and Deceleration Lanes

Acceleration lanes and deceleration lanes would be extended at Cole Avenue, Mid-City Motor World, Indianola Cutoff (except Alternatives 2 and 3), Bracut (east side of highway). At Bayside Cutoff the existing configuration would be replaced by on- and off ramps. Acceleration and deceleration lanes would be established at Simpson Sawmill and the on the west side of Bracut. To accommodate the northbound (right side) acceleration/deceleration lane at Cole Avenue (median crossing closed in 2004), the northbound lanes would be realigned toward the median. This is the only lane work location in which the widening would involve realigning the lanes toward the median. The acceleration /deceleration lanes would include 2.4-meters (eight-feet) wide right-side shoulders.

To extend the existing acceleration/deceleration lanes on southbound 101 at the Simpson Sawmill, roadway widening would require the removal of approximately 300 large blue gum eucalyptus (*Eucalyptus globulus*) trees on the right shoulder. An existing roadside ditch drains the runoff from the southbound highway lanes and railroad. This ditch is located between the row of trees and the railroad. The widening and the tree removal would impact this ditch. The flow from this ditch continues through a 58-meter (190 feet) long by 1.2-meter (four feet) wide by 0.9-meter (three-feet) high concrete box culvert under Route 101 and terminates at the Route 101 slough via a 0.9-meter by 1.21-meter (three feet by four feet) tide gate. The ditch is about 3.2 km (two miles) long; it starts just south of Bracut. The width and depth of the ditch increases gradually from north to south. The tide gate allows the possibility of fish access to this drainage. However, the 58-meter (190 feet) long culvert in combination with the tide gate makes it very unlikely that fish are present in the ditch. Only the northernmost 2.4-kilometers (1½ miles) of this ditch would be impacted by the project. The 0.8-kilometer (½ mile) of the ditch closest to the box culvert (where tidewater goby could be potentially present) would not be impacted by the roadwork. The work in this ditch is unlikely to impact the tidewater goby fish. See Section 3.3.2 for more discussion about the ditch and wetlands. See Section 3.3.5 for more discussion regarding the tidewater goby.

Close Median Crossings

All remaining Route 101 median crossings would be closed at the following intersecting roads/driveways: Airport Road, Mid-City Motor World, Simpson Sawmill, Indianola Cutoff, Bracut, and Bayside Cutoff. Median closures would consist of the removal of asphalt-concrete paving and possibly some excavation and seeding bare slopes with native or cultivated grasses.

Interchange at Indianola Cutoff -- Alternatives 2 and 3

The compact diamond undercrossing consists of elevating Route 101 by up to 7.6-meters (25-feet) above the existing highway. There would be separate northbound and southbound bridges crossing Indianola Cutoff. Indianola Cutoff would continue at its present alignment and grade. See Section 3.3.2 for more discussion about the wetland impacts associated with the proposed interchange.

Signal at Airport Road and Bridge Across the Route 101 Slough -- Alternative 3

To allow traffic to queue at the intersection of Route 101 and Airport Road, Airport Road would be relocated across the end of an abandoned runway of the airport, and across the existing ditch east of northbound 101 to a new intersection location on Route 101. This would allow a minimum of two lanes 100-meters (330-feet) in length for queuing of turning vehicles from Airport Road or Jacobs Avenue. The new intersection would be located approximately 90-meters or 300-feet north of the present intersection with Airport Road. The vegetated median at the new Airport Road crossing would be filled and paved for the new median crossing. The paving would be removed from the existing median crossing and from Airport Road at its intersection with Route 101. The areas of removed paving would be re-vegetated to complete the removal/relocation of the intersection.

The Airport Road realignment would also require a new crossing of the Route 101 Slough. The bridge structure would be single-span. (A single span structure does not require placing support piles in the slough.) It would not require rock slope protection on the slough banks. This bridge construction work would not incur any impacts to the slough. Although tidewater goby and other fish are known to be present in this slough, the installation of the bridge would not likely have any effect on them since the proposed single span bridge would not require placing any piers in the slough.

An additional lane would be constructed from the Cole Avenue acceleration lane to Mid-City Motor World to minimize operational impacts to Route 101 because of the placement of a signal at Airport Road. A retaining wall would be required for a portion of the distance between Cole Avenue and Airport Road, to avoid placing fill on the existing slope so as to minimize impacts to wetlands and existing drainage patterns. The exposed height of the retaining wall would be approximately 1.2-meters or four-feet. The additional width required from Cole Avenue to Mid-City Motor World would vary up to 4.3-meters or fourteen-feet. The widening for the additional lane north of the intersection with Airport Road would occur within the median to avoid any further encroachment into the airport's flight approach/departure surface. The fill for the lane would extend up to 7.6-meters (25-feet) into the median with fill up to 1.5-meters (five-feet) in depth and extending up to 3.7-meters or

twelve-feet from the existing edge of paving. The additional lane would continue to Mid-City Motor World, where the lane would be dropped to two northbound lanes.

Clear Recovery Zone

For all Build Alternatives, twenty to forty mature Monterey cypress (*Cupressus macrocarpa*) and Monterey pine (*Pinus radiata*) trees would be removed that are currently too close to the edge of the Route 101 traveled way. Large trees can pose potential hazards for errant vehicles or vehicles making emergency maneuvers. Removing or shielding fixed objects that are within nine-meters or thirty feet from the edge of the traveled way, known as the clear recovery zone, would enhance safety.

Summary

The effects of Alternatives 1-3 on biological resources in the study area would primarily be from habitat loss within the expanded area of the constructed project. The proposed Route 101/Indianola Cutoff interchange included in Alternatives 2 and 3 would result in greater permanent habitat loss than Alternative 1. Alternative 3 would have a slightly larger area of permanent wetland impact than Alternative 2 because of the construction of a realigned, signalized intersection at Airport Road (see Tables 3-29 and 3-30 for temporary and permanent wetland impact areas by wetland type). In addition, the new bridge would shade approximately 1,500 square feet of substrate (the watercourse bed, bank, or channel bottom), and submergent vegetation. Approximately 93 square meters or 1,000 square feet of herbaceous riparian vegetation and riparian shrubs (*Baccharis pilularis*) would be removed. This would have a minor impact on system productivity of the 101 Slough. Alternative 7, the No-Build, would not result in any additional adverse effects to biological resources, however, the No-Build does not include the “fish-friendly” tide gates that would enhance tidewater goby and salmonid habitat. To minimize potential effects upon biological resources, general avoidance and minimization measures would be implemented as a part of Alternatives 1-3.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

To minimize potential adverse effects upon biological resources, general avoidance and minimization measures would be implemented as a part of Alternatives 1, 2, and 3. General avoidance and minimization measures would be implemented as part of construction activities in order to minimize and avoid impacts to sensitive as well as common biological resources. General avoidance and minimization measures are described below:

- **Construction Worker education.** The pre-job meeting with construction will consist of a briefing on environmental issues relative to the proposed project. Information will be provided by a qualified biologist.

- **Erosion control.** Temporary erosion control measures will be implemented on all disturbed areas. Permanent erosion control measures will be implemented upon completion of construction. All disturbed areas will be re-vegetated with native, non-invasive species or non-persistent hybrids that will serve to stabilize site conditions and prevent invasive species from colonizing.

- **Environmentally Sensitive Areas.** Caltrans will establish and indicate Environmentally Sensitive Areas (ESAs) on project plans and specifications to avoid potential construction impacts to sensitive biological resources (rare plant populations) adjacent to the construction corridor. Temporary exclusionary fencing will be placed around populations of special status plant species prohibiting construction activities in those areas.

- **Construction Monitoring.** Caltrans will have a qualified biologist as needed to monitor construction activities in sensitive biological resource areas (see Section 3.3 for a description of these areas) to monitor for permit compliance and avoidance and minimization requirements compliance.

- **Compliance with Migratory Bird Treaty Act.** Grass, tree and shrub removal will take place between September 1st and March 1st to avoid impacts to nesting birds in compliance with the Migratory Bird Treaty Act. If appropriate, measures will be taken to avoid impacts to swallows nesting on the Jacoby Creek Bridges and northbound Gannon Slough Bridge by exclusionary netting or regular nest removal.

3.3.2 Wetlands and Other Waters of the United States

REGULATORY SETTING

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into Waters of the United States, including wetlands. "Waters of the United States" as defined by the Clean Water Act include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce.

All three of the following factors must be present, under normal circumstances, for an area to be designated jurisdictional wetland subject to the Clean Water Act.

1. Include the presence of hydrophytic vegetation (growing wholly or partially in water);

2. Hydrology (wetland hydrology occurs in areas where the soil is saturated or inundated by flooding or groundwater);

3. Hydric soils (soils subject to water saturation/inundation).

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the Nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (EPA).

The NEPA/404 integration process is implemented when a project has the potential to exceed two-hectares (five-acres) of direct impact to USACE jurisdictional wetlands and requires the preparation of Environmental Impact Statement. Currently FHWA and Caltrans have received written concurrence from the USEPA, U.S. Fish and Wildlife Service (USFWS), USACE, and NOAA Fisheries (NOAAF) on the project's Need and Purpose, Criteria for selecting and evaluating Alternatives, and Range of Alternatives. See Appendix E for more information regarding the NEPA/404 process.

Caltrans received final USACE wetland jurisdictional determination, including wetland delineation verification, on May 24, 2006.

At the state level, the Department of Fish and Game (CDFG) wetlands and state waters. Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. The upper limits of the stream or lake banks, or the outer edge of riparian vegetation, usually define CDFG jurisdictional limits, whichever is wider. Wetlands, under jurisdiction of the USACE, may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG. Since this project is within the Coastal Zone, the California Coastal Commission as well as the County of Humboldt and City of Arcata would also regulate coastal wetlands.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. (See Section 3.2.2 - Water Quality in this chapter for additional details.)

AFFECTED ENVIRONMENT

Physical Conditions

The Biological Study Area (BSA) for wetlands and other Waters of the U.S. includes the eastern margin of Humboldt Bay (includes Arcata Bay) between Eureka and Arcata. The Bay is 22.5-kilometers (14-miles) long and 7.2-km (4.5-miles) wide at the widest point, with an area of 62.4-square kilometers (km^2) (24.1-square miles [$miles^2$]) at mean high tide. The Bay is shallow and has extensive mudflats interlaced with drainage channels and a few major shipping channels. Humboldt Bay's watershed is 578-km^2 (223-$miles^2$) along the foothills of the Coast Range. Fresh water enters the Bay from Jacoby Creek, Elk River, Freshwater Creek/Eureka Slough, McDaniel Slough, Mad River Slough, and other small sloughs and creeks. The BSA crosses Eureka Slough, although no construction would occur along the Eureka Slough Bridge. The northern terminus of the BSA extends to the Route 101 11th Street overcrossing structure in Arcata. The Bay side of Route 101 is located close to salt marshes and intertidal mud flats, while the eastern edge of Route 101 is adjacent to commercial development, rangeland and a wildlife refuge**.** (See Plan Sheets in Appendix A.)

The BSA was historically tidal wetlands. The process of diking tidal wetlands for conversion to agricultural uses began in the 1880s. The conversion of wetlands to pasture land was accelerated by construction of the Northwestern Pacific Railroad in 1901 and subsequent placement of tide gates, which further restricted tidal influence over adjacent lands. The low-lying areas became seasonally saturated freshwater marshes or agricultural wetlands dominated by exotic pasture grasses.

Jacoby Creek flows under Route 101 just north of the Bayside Cutoff. It originates in the Coast Range just southwest of Kneeland and flows northwest for about ten miles to its outlet at Humboldt Bay south of Arcata. The upper reaches of Jacoby Creek provide spawning habitat for salmonids. The estuary provides habitat for tidewater goby as well as Coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), Steelhead–Northern California ESU (*Oncorhynchus mykiss*), and Coastal cutthroat trout (*Oncorhynchus clarki clarki*), the first four of which are federally-listed species. The Coho salmon is also listed as Threatened under the California Endangered Species Act. The tidewater goby, steelhead, and coastal cutthroat trout are also State species of concern. See Section 3.3.5 - Threatened and Endangered Species later in this chapter.

Gannon Slough flows under Route 101 just north of Jacoby Creek. It originates about 3.2 kilometers or two miles north in Arcata and extends south along the right side of northbound 101 to its outlet into Humboldt Bay just north of Jacoby Creek. Gannon Slough and its tributaries (Beith, Campbell, and Grotzman Creeks) also provide habitat for tidewater goby, Coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout.

The Natural Resources Conservation Service (NRCS) is currently conducting a soil survey for Humboldt County. Soil mapping in the BSA is in preliminary draft form. The available soil information from the draft soil survey indicates that the soils in the BSA from Washington Gulch to Jacoby Creek are Swain's Slough silty clay loam (NRCS 2003). Soil series data for other locations within the BSA are not available at this time.

The dominant habitat in the BSA consists of ruderal grassland (grasses that grow in disturbed areas) located along the shoulders of Route 101 and in portions of the median that are not Estuarine Intertidal Wetland. An approximately three-meter (ten-foot) area is mowed every spring and fall along the Route 101 shoulders and in the median. Dominant species in the ruderal grassland habitat include non-native species such as scarlet pimpernel (*Anagallis arvensis*), black mustard (*Brassica nigra*), fennel (*Foeniculum* vulgare), wild radish *(Raphanus sativus*), perennial trefoil (*Lotus corniculatus*), dandelion (*Taraxacum officinale*), and narrowleaf plantain (*Plantago lanceolata*). Other non-native plant species that occur in the BSA include Himalayan blackberry (*Rubus discolor*), pampas grass (*Cortaderia jubata*) and curly dock (*Rumex crispus*).

Wetlands in the BSA were delineated (methodically identified according to established protocol) in Spring 2002. Since the BSA is adjacent to Humboldt Bay and lies in the California Coastal Zone, wetlands present in this area are also under the jurisdiction of the California Coastal Commission (CCC). The Coastal Zone encompasses the entire project area south of the Route 255/101 interchange in Arcata. The CCC and California Department of Fish and Game (CDFG) definition of a wetland requires only one of the three factors (sufficient hydrology, hydric soil, predominance of hydrophytic vegetation) described in the previous Regulatory section. Because of this, the limits of the CCC-determined wetlands may differ from the Corps-determined wetlands. Coastal wetlands are inclusive of U.S. Army Corps of Engineers wetlands. Less-than-three parameter wetlands are present in the project area at the upland edges of the Estuarine Intertidal Wetland (within the highway median and highway right-of-way). The locations of jurisdictional wetlands and other Waters of the U.S. within the Route 101 BSA are shown on the Wetland Plan Sheets in Appendix A.

Jurisdictional Wetlands

Potential jurisdictional wetlands and other waters of the U.S. were delineated (methodically identified) in the BSA. The locations of potential jurisdictional wetlands and other waters are shown on the Wetland Plan Sheets in Appendix A.

Wetlands are natural communities of special concern. Wetlands and other aquatic communities based on the Cowardin classification system (Cowardin 1979) are

present in, or immediately adjacent to, the BSA along the edges of the sloughs and within drainage ditches adjacent to Route 101:

Estuarine Subtidal Unconsolidated Bottom Aquatic Habitat (continually inundated part of the channel in the 101 Slough, Jacoby Creek, Gannon Slough, Old Jacoby Creek, and Brainard Slough).

Estuarine Intertidal Unconsolidated Shore Wetland (areas of the median between Gannon Slough and Jacoby Creek, the banks of Jacoby Creek, Gannon Slough, Brainard Slough, and the southern 101 Slough).

Palustrine Scrub/Shrub Wetland (all other intermittently flooded wetlands along the shoulders and in the median).

Palustrine Emergent Wetland (101 Slough north of Mid-City Motors, the Jacobs Avenue ditch, the Simpson Ditch, and the ditches in and around the Route 255 interchange).

Estuarine Subtidal Unconsolidated Bottom Aquatic Habitat

Estuarine Subtidal Unconsolidated Bottom Aquatic Habitat is present in the deepest parts of the sloughs in and adjacent to the BSA. These areas include parts of Gannon Slough, Brainard Slough, 101 Slough and Old Jacoby Creek. They are underwater even at lowest tides, and are subject to both tidal and fresh water influence. South of Airport Road in the 101 Slough eelgrass (*Zostera marina*) grows below the +1 ft elevation to approximately –1.5 ft, in varying density, depending on tidal velocity, turbidity, or other variables. Tidewater goby and salmonids can be found in these areas.

Estuarine Intertidal Unconsolidated Shore Wetland

Estuarine Intertidal Unconsolidated Shore Wetland is present in the sloughs in and adjacent to the BSA. These areas are present at the margins of Humboldt Bay, banks of Eureka Slough, Gannon Slough, Jacoby Creek, Brainard Slough, 101 Slough, and Old Jacoby Creek, and are subject to both tidal inundation with some fresh water influence. However, they are exposed at low tides. There is also an area of this wetland type in the median between Jacoby Creek and Gannon Slough. This wetland type contains herbaceous, salt-tolerant hydrophytes (plants that grow partly or wholly in water) forming moderate to dense cover. This habitat is usually found in sheltered inland margins of bays, lagoons, and estuaries. The hydric soils are subject to regular tidal inundation by salt water for at least part of each year. Water salinity is greater than or equal to 0.5 ‰. In the BSA, these wetlands have stands of pickleweed (*Salicornia virginica*) and saltgrass (*Distichlis spicata*). In addition to these species, jaumea (*Jaumea carnosa*) and arrow-grass (*Triglochin maritima*) are present. At a

slightly higher elevation, plant species diversity increases and in addition to the species listed above, this area may support salt marsh plantain (*Plantago maritima* var. *juncoides*), sea milkwort (*Glaux maritima*), salt rush (*Juncus lesuerii*), and sand spurrey (*Spergularia canadensis* and *S. macrotheca*). Three CNPS List 1B plants, Humboldt Bay owl's clover, Lyngbye's sedge, and Point Reyes bird's beak are also associated with the Estuarine Intertidal Unconsolidated Shore Wetland community. For more information regarding special status plants see Section 3.3.3.

Palustrine Emergent Wetland Habitat

Palustrine Emergent Wetlands are associated with rivers, creeks, drainage ditches, and ponds with freshwater input. These wetlands contain dense grasses, sedges, and herbs that thrive, at least seasonally, under moist or saturated conditions. The freshwater plant communities include water parsley (*Oenanthe sarmentosa*), canary grass (*Phalaris* sp.), marsh pennywort (*Hydrocotyl* sp.), rush (*Juncus* sp.), bulrush, sedge, and buttercups (*Ranunculus* sp.). Cattails may also occur in this habitat—especially in drainage ditches or shores of slow moving creeks.

Palustrine Emergent Wetlands are found in the 101 Slough north of Mid-City Motors, the ditch that runs between Route 101 and Jacobs Avenue, the Simpson Mill ditch, and the ditches around the Route 101/Route 255 Interchange. This freshwater wetland is dominated by *Typha latifolia* and is above the limits of tidal flushing. *T. latifolia* can be found in water with less than 0.5 ‰ salinity (Thunhorst 1993). Testing of the water in the 101 Slough just north of Mid-City Motors showed a salinity level of less than 0.1 ‰. Emergent vegetation cover (cattails and bulrushes) in these areas is between 5% and 90%. The water flow is stagnant or very slow in these areas; oxygen levels are low.

Wetlands within the highway median and along the shoulders on both sides of the highway were also classified as palustrine emergent type. These areas are mowed several times per year; only persistant herbaceous flora is present. However, in unmowed adjacent areas coyote brush, California and Himalyan blackberry, California wax myrtle and other shrubs are dominant. This habitat is saturated or intermittently inundated by rainwater run-off. There is no tidal influence.

Within the project BSA these wetlands are characterized by plant communities dominated by emergent herbs adapted to seasonally or permanently saturated soils, including sedge or mixed communities containing rush (*Juncus* sp.), silverweed (*Potentilla anserina* ssp. *pacifica*), and bentgrass (*Agrostis alba*). Other species found in this area include arrow-grass, bulrush (*Scirpus* sp.), and yarrow (*Achillea millefolium*)

Wetland Functions and Values

Wetland ecosystems possess unique functions and values that vary depending on the type of wetland, its size, surrounding land uses, and the degree to which it has been previously disturbed. Wetland functions are defined as the physical, chemical, and biological attributes of a wetland such as flood storage, species habitat, or groundwater discharge. Other functions of wetlands may have specific "values" that are considered beneficial to society such as groundwater recharge, recreation, or aesthetics.

Each wetland type was evaluated separately to determine general wetland functions and values. Categories of wetland functions and their evaluation criteria were based on the Wetland Evaluation Technique (WET) developed jointly by the USACE for the FHWA (Adamus et al. 1987). This document describes a qualitative approach that addresses each of the following standard functions for each wetland type:

Groundwater recharge
Groundwater discharge
Flood flow alteration
Sediment/toxicant retention
Nutrient removal/transformation
Production export
Wildlife diversity/abundance
Aquatic diversity/abundance
Uniqueness/heritage
Recreation

Functions and values of the wetlands in the BSA were evaluated based on field observations and other available data. Results of other project-related studies were used to assess some of the potential functions such as habitat and water quality. Specific criteria used to evaluate the functions and values of the wetlands included wetland condition, whether the wetland was natural or artificial, commonness or rarity and presence or absence of sensitive species, size, magnitude of potential impacts, and the regional status of the wetland type.

This analysis is based on the assumption that wetland functions are related to the wetland types. For instance, isolated freshwater seeps are likely to have functions and values that differ from the functions and values of a riparian wetland type where saturation or inundation occurs all year. Other factors that affect the functional assessment of wetland types are vegetative development of the wetland site, barriers between a wetland and adjoining uplands, and adjacent land uses. Factors that affect the social significance, or value, of a wetland include the presence of one or more of the following: a special status species, significant archeological resources, "unique" wetland types, a source of drinking water, or publicly owned lands designated for conservation, preservation, or research.

The probability that a particular wetland type performs a specific function was assessed using the Wetland Evaluation Technique (WET) as a guideline. This approach assigns a value of High, Moderate, or Low depending on the presence or absence of certain indicators of wetland function (e.g. a value of "high" means there is a high probability that the wetland performs a particular function). Table 3-28 presents the criteria defined for WET assessments. This wetland evaluation technique was supplemented with site-specific details for the BSA.

The Cowardin System Wetlands in the BSA include Estuarine Intertidal Unconsolidated Shore and Palustrine Emergent Wetland. Cowardin non-wetland Waters of the U.S. in the BSA includes the Estuarine Subtidal Unconsolidated Bottom in the 101 Slough, Jacoby Creek, and Gannon Slough. These areas are always underwater. One or two 450-mm or 18-inch diameter bridge piles would be driven in the Estuarine Subtidal Unconsolidated Bottom of Gannon Slough and twelve 450-mm or 18-inch bridge piles would be driven in the Estuarine Subtidal Unconsolidated Bottom of Jacoby Creek. Within the BSA this habitat has moderate overall function and value due to the presence of listed Threatened and Endangered fish species. Additional details of potential impacts to these waters and minimization measures are detailed in Section 3.3.5 – Threatened and Endangered Species.

Estuarine Intertidal Unconsolidated Shore within the BSA is found at the 101 Slough, Gannon Slough, Eureka Slough, Jacoby Creek, Brainard Slough, Old Jacoby Creek and in Humboldt Bay. These areas are on the banks within tidal influence and are exposed at low tide. A portion of the median between Jacoby Creek and Gannon slough is also this type of wetland. Within the BSA this type of wetland has moderate overall function and value (Table 3-28).

The disturbance to this wetland type would include bridge construction work and replacement of the tide gates. This work will be done at low tide, with additional measures taken to minimize impact.

The Simpson Mill Ditch, the Jacobs Avenue Ditch, the northern section (Mid–City Motors north to Bracut) of the 101 Slough and the watercourses at the Route 101/255 interchange are Palustrine Emergent Wetlands. These areas are fed by rainwater and are drained to the inland side of Route 101 by a number of culverts throughout the BSA. These areas are characterized by year-round standing water with minimal flushing flow and salinity less than 0.5‰. The habitat is anaerobic and vegetated primarily by cattails and bulrushes. The Palustrine Emergent Wetland present in the study area is considered to have moderate function and value (Table 3-28). The proposed project will impact this habitat in the northern section of the 101 Slough by connecting it to Humboldt Bay. This will establish tidal influence at the north end of the slough converting it to Estuarine Intertidal Unconsolidated Shore Wetland. This will increase wetland function and value by creating habitat suitable for the federally listed tidewater goby and other fishes.

Additional Palustrine Emergent Wetland occurs in areas along the existing transportation ROW and within the median that are routinely mowed. These wetlands areas have generally moderate functions and values due to their proximity to the road and their isolation from the bay. Flood flow alteration is low to moderate due to the capacity to delay runoff from the highway. All other functions listed in Table 3-28 are low-moderate due to the mowing and location adjacent to the highway. This area is vegetated primarily by herbaceous vegetation. These areas are saturated or intermittently inundated by rainwater. These wetlands drain to the inland side of Route 101 via a number of culverts throughout the BSA.

In California, lands within the Coastal Zone that exhibit even a single wetland parameter, or characteristic (sufficient hydrology, hydric soil, predominance of hydrophytic vegetation) are deemed wetland by the California Coastal Commission. Coastal wetlands are inclusive of USACE wetlands. Less-than-three parameter wetlands are present in the project area at the upland edges of the Estuarine Intertidal Scrub/Shrub Wetland (within the highway median and ROW).

Wetland values refer to the benefits that wetlands provide to the environment or people and include ecological, social, or economic values. Wetland ecosystems possess unique functions and values that vary depending on the wetland type, its size, surrounding land uses, and the degree to which it has been previously disturbed. Wetland functions are defined as the physical, chemical and biological attributes of a wetland which include groundwater recharge, floodwater storage, sediment/toxicant retention, nutrient removal/transformation, aesthetics, wildlife diversity and abundance and aquatic diversity and abundance. Other functions of wetlands may have specific “values” that are considered beneficial to society such as groundwater recharge, recreation, or aesthetics. The functions and values of these wetlands types are discussed in Table 3-28. All surface waters in the BSA flow into Humboldt Bay.

Table 3-28

Summary of Wetland Functions and Values within the Project Biological Study Area

Function / Value	Criteria	Estuarine Subtidal Waters	Estuarine Intertidal Wetland	Palustrine Emergent Wetland
Groundwater recharge	High: groundwater table slopes away from wetland, non-riparian, not permanently inundated. Low: wetlands with impervious underlying strata or marine/estuarine wetlands	Low (1) Rationale: marine/ estuarine wetlands.	Low (1) Rationale: marine/ estuarine wetlands.	Moderate (2) Rationale: not permanently inundated, groundwater table mostly influenced stormwater runoff.
Groundwater discharge	High: permanently inundated, below dam/impoundment, outlets but no defined inlet, presence of springs Low: rated "High" for groundwater recharge, non-permanently flooded wetlands lacking the "High" characteristics defined above	Moderate (2) Rationale: Permanently inundated. Inlet well defined. Sloughs and Jacoby Creek	Low (1) Rationale: Not permanently inundated. Defined inlet and outlet.	Moderate (2) Most areas not permanently inundated. Non-riparian No defined inlet, weakly define outlet
Floodflow alteration	High: regulated reservoir, outflow less than inflow, non-tidal, capacity to delay runoff (depression) Low: permanently inundated (i.e. less capacity), no potential for ponding, all tidal wetlands	Low (1) Rationale: Tidal wetlands, low capacity. Sloughs and Jacoby Creek	Low (1) Rationale: Tidal wetlands, low capacity	Low (1) - Moderate (2) Rationale: Most areas not permanently inundated. In 101 Slough outflow slow. In median, capacity to delay runoff.
Sediment Stabilization	High: potential erosive forces present, canals/levees present that confine water, high water velocity, evidence of long-term erosion, presence of water & vegetation interspersion. Low: no flowing water, no open water wider than 30 meters or 100 feet, no eroding areas abutting the wetland, no vegetation or rubble	Moderate (2) Rationale: flowing water fluctuating with tides, but no open water wider than 30-meters or 100-feet, no vegetation or rubble	Moderate (2) Jacoby & Gannon canals present that confine water, low water velocity, tidal fluctuation.	Moderate (2) Rationale: In median-- Well vegetated, no flowing water, no open water wider than 30-meters or 100-feet

Table 3-28

Summary of Wetland Functions and Values within the Project Biological Study Area

Function / Value	Criteria	Estuarine Subtidal Waters	Estuarine Intertidal Wetland	Palustrine Emergent Wetland
Sediment/ toxicant retention	High: potential for erosion or toxicants in the watershed combined with capacity to confine or impound water; no outlet (or constricted), riffle and pool complexes, erect vegetation Low: no flowing water, no open water, > 30 meters or 100 feet wide, or no vegetation; immediately downstream of impoundment, high-velocity flows, tidal flows	Moderate (2) Rationale: flows fluctuating with tides, > 30 meters or 100 feet wide, or no vegetation. Sloughs and Jacoby Creek.	Low (1); Rationale: Tidal flows. No open water > 30 meters or 100 feet wide, and little vegetation.	Low (1) to Moderate (2) Rationale: In median, low flowing water, no open water > 30 meters or 100 feet wide. Water confined, vegetation present.
Nutrient removal/ transformation	High: same as for sediment/toxicant retention (capacity to confine or impound water; no outlet, constricted, riffle & pool complexes, erect vegetation) Low: low sediment trapping, peat sediments, anoxic water column, marine wetlands	Low (1) Rationale: flows fluctuating with tides, little vegetation. Sloughs and Jacoby Creek	Low (1) Rationale: Outlet flows fluctuating with tides, marine wetlands	Low (1) to Moderate (2) Rationale: in median, low flowing water, no open water, > 30 meters or 100 feet wide.
Production export	High: high primary productivity & high water velocity; Riverine wetlands with eutrophic conditions. Marine or estuarine with high primary productivity or eutrophic conditions. Low: no permanent or intermittent outlets	High (3) Rationale: Estuarine with high primary productivity. Sloughs and Jacoby Creek	High (3) Rationale: High primary productivity of brackish marsh vegetation and outlet	Low (1) Rationale: No permanent or intermittent outlets
Wildlife diversity/ abundance	High: riparian wetlands, floodplain wetlands, high vegetation diversity, wetland-upland complexes, large & diverse wetlands. Low: isolated wetlands within urbanized areas, lack of connecting corridors, small wetlands with low vegetation diversity	Moderate (2) to High (3) Rationale: moderate wildlife and plant diversity, fairly high diversity of bird species, some special status species present.	High (3) Rationale: Fairly high diversity of bird species; Rare plants present at Jacoby Creek and Gannon Slough.	Low (1) Rationale: Isolated wetlands within urbanized areas, lack of connecting corridors, low vegetation diversity

Table 3-28

Summary of Wetland Functions and Values within the Project Biological Study Area

Function / Value	Criteria	Estuarine Subtidal Waters	Estuarine Intertidal Wetland	Palustrine Emergent Wetland
Aquatic diversity/ abundance	High: regularly flooded, erect vegetation, adequate levels of dissolved oxygen, diverse vegetation cover providing partial shading Low: substrate of bedrock or rubble, farmed, acidic surface water	Moderate (1) Rationale: low dissolved oxygen; tall, erect vegetation that provides some habitat for birds. Poor fish habitat due to low oxygen.	High (3) Rationale: diverse fish species present. Habitat, nursery, & refuge areas for fish.	Low (1) Rationale: 101 Slough poor fish habitat due to low O_2. Median /shoulders insufficient water for aquatic species.
Uniqueness/ heritage	High: presence of special status species, significant archeological resources, "unique" wetland types, or publicly owned lands designated for conservation, preservation, or research Low: absence of criteria listed above	High (3) Rationale: Potential presence of special-status species. Area is adjacent to the CDFG Eureka Slough Wildlife Area	High (3) Rationale: adjacent to the Publicly owned Wildlife Areas. Rare plants present	Low (1) Rational: in median, not a unique wetland type, not designated for conservation.
Recreation	High: wetlands utilized and accessible for recreation Low: wetlands not utilized or accessible for recreation	Low (1) Rationale: Sloughs and Jacoby Creek along Route 101 not utilized or accessible for recreation.	Moderate (2) Rationale: Public land adjacent to Route 101 used for waterfowl hunting.	Low (1) Rationale: Median /shoulder wetlands not utilized or accessible for recreation
Summary of Wetland Functions:		**23-24 (Moderate)**	**21 (Moderate)**	**15-17 (Low-Moderate)**

ENVIRONMENTAL CONSEQUENCES

Potential project impacts by Alternative have been evaluated, and where feasible, quantified. See Tables 3-29, 3-30A, and 3-30B as well as Figures 3-26A – E.

Alternative 1 - 1.57 hectares or 3.89 acres total permanent wetland impact

Alternative 1 would have the least wetland impact. The wetlands that will be impacted by Alternative 1 are primarily Palustrine Emergent Wetlands vegetated primarily by grasses and other herbaceous vegetation. These include 1.29 hectares or 3.2 acres of USACE Jurisdictional (1.54 hectares or 3.8 acres of Coastal Jurisdictional Wetland) Palustrine Emergent Wetlands that would be permanently impacted by placement of right-turn acceleration and deceleration lanes and the installation of shoulder backing. These areas consist of narrow strips of wetlands adjacent to the paved roadway over about twenty miles on both shoulders and along the edges of the median. These wetlands have relatively low functions and values (see Table 3-28) because of their proximity to the Route 101 roadway, isolation from other wetlands, and the routine mowing of the area. These factors, in addition to their long, narrow shape, limit their value as habitat for wildlife. In addition, they have low to moderate value for sediment/ toxicant retention.

Alternative 2 – 5.36 hectares or 13.25 acres total permanent wetland impact

Alternative 2 would have substantially more wetland impact compared to Alternative 1 because it includes a new interchange at Indianola Cutoff. In addition to the Alternative 1 impacts, Alternative 2 would permanently affect approximately 3.72 hectares or 9.2 acres of USACE Jurisdictional (3.8 hectares or 9.4 acres Coastal Jurisdictional Wetland) Palustrine Emergent Wetlands with the construction of an interchange at Indianola Cutoff. The wetlands that would be impacted at the Indianola Interchange are vegetated primarily by grasses and other herbaceous vegetation. Like the other Palustrine Emergent Wetlands in the BSA, this area has relatively low function and value (see Table 3-28) because of its proximity to the road, its isolation from other wetlands and the routine mowing of the area. See Figure 3-25B – Photograph of existing wetland within Route 101 at the location of the proposed Indianola Cutoff interchange.

Alternative 3 – 6.24 hectares or 15.41 acres total permanent wetland impact

Alternative 3 would have the greatest wetland impact since it includes all of the features of Alternatives 1 and 2, plus a proposed realignment of the Airport Road intersection with Route 101. In Addition to the wetlands that will be impacted by Alternative 2, Alternative 3 would impact an additional 0.89 hectares or 2.2 acres of USACE Jurisdictional (Coastal Commission Jurisdictional Wetland the same) by the

realignment of Airport Road and the placement of a new Airport Road Bridge across the 101 Slough. This area is also primarily Palustrine Emergent Wetlands vegetated by grasses and other herbaceous vegetation. The area is close to Murray Field Airport and commercial development on Jacobs Avenue. Because of its proximity to Route 101, its isolation from other wetlands and the routine mowing of the area, this wetland area has low function and value (see Table 3-28).

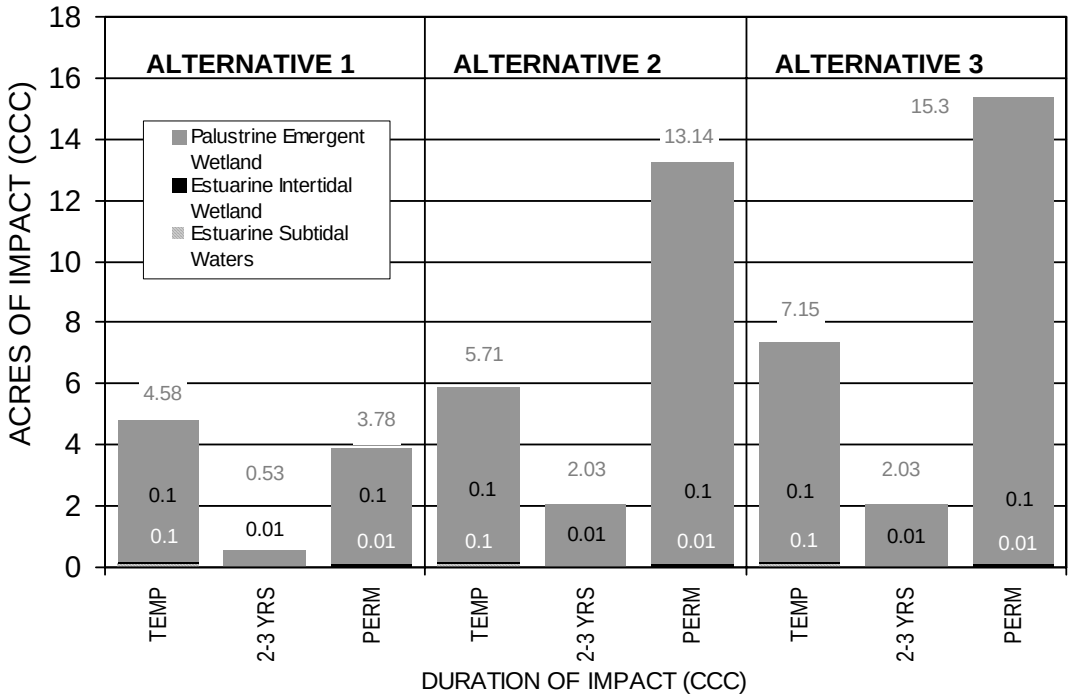
Table 3-29
Impacts to Wetlands and Waters of the U.S.
(In Acres)

		ALT. 1		ALT. 2		ALT. 3	
		Coastal Wetlands[10]	**USACE Wetlands**	**Coastal Wetlands[10]**	**USACE Wetlands**	**Coastal Wetlands[10]**	**USACE Wetlands**
Estuarine Subtidal Waters	TEMP[1]	0.10	0.10	0.10	0.10	0.10	0.10
	PERM[2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Estuarine Intertidal Wetland	TEMP[3]	0.10	0.10	0.10	**0.10**	0.10	0.10
	2-3 Years[4]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PERM[5]	0.10	0.10	0.10	0.10	0.10	0.10
Palustrine Emergent Wetland	TEMP[6]	4.58	4.58	5.71	5.71	7.15	7.15
	2-3 Years[7]	0.54	0.54	2.04	2.04	2.04	2.04
	PERM[8]	3.78	3.24	13.14	11.43	15.30	13.59
Total Impact Acreage	TEMP[9]	**5.32**	**5.32**	**7.95**	**7.95**	**9.39**	**9.39**
	PERM	**3.89**	**3.35**	**13.25**	**11.54**	**15.41**	**13.7**

[1] Area of impact (less than one year) for bridge construction work, pile removal, and double-walled isolation chambers.
[2] Area of impact for new piles associated with bridge construction work.
[3] Area of impact on banks of Jacoby Creek and Gannon Slough for construction and access.
[4] Area of impact (for 2-3 years) in median between Jacoby and Creek Gannon Slough due to temporary detour paving.
[5]Area of impact on banks of Jacoby Creek and Gannon Slough for abutments and rock slope protection.
[6] Area of impact on highway shoulders, median and at Simpson ditch for construction, equipment access and staging.

[%] Title 23, USC, § 138(b) contains an identical provision, applicable only to the Federal Highway Administration. Section 303 of title 49, USC, applies to all USDOT programs and projects.

[7] Area of impact (for 2-3 years) due to paving of temporary detour at Indianola Interchange, Gannon Slough and Jacoby Creek.
[8] Area of impact on highway shoulders and median due to permanent paving or fill.
[9] Includes all temporary impacts (less than one year and 2-3 year).
[10] Coastal wetland impact area includes USACE wetland impact.



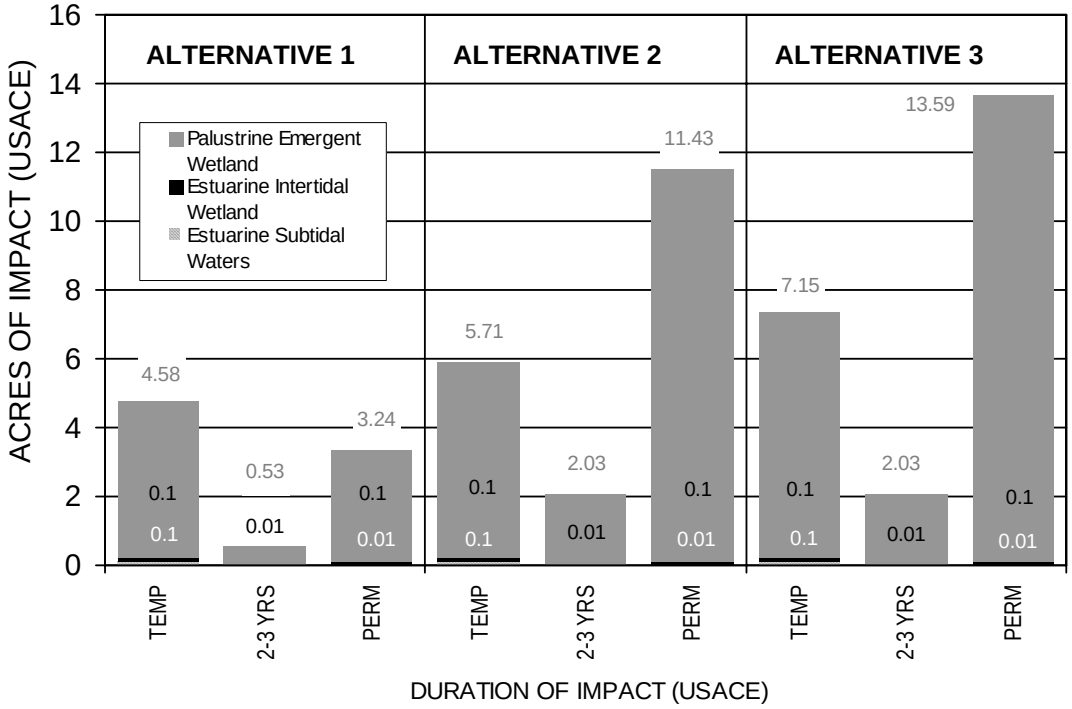


Table 3-30
Impacts to Coastal Commission (top) and Army Corps (bottom) Jurisdictional Wetlands and Waters

Figure 3-25A
Photograph facing north, adjacent to Route 101 and the Route 101 Slough showing approximate location of proposed crossing of Airport Rd. for Alternative 3. Intertidal, and Palustrine Wetlands would be impacted at this location

Figure 3-25B
Photograph facing northeast showing location of proposed replacement of the Route 101 southbound Jacoby Slough Bridge. Subtidal, Intertidal, and Palustrine Wetlands would be impacted at this location for all Build Alternatives

Figure 3-25C
Photograph facing south at location of proposed Route 101/Indianola Cutoff interchange for Alternatives 2 and 3. Palustrine Wetlands would be impacted between roadway shoulder and railroad

Figure 3-25D
Photograph of Route 101 median facing south at location of proposed Route 101/Indianola Cutoff interchange. Palustrine Wetlands would be impacted within the existing roadway median.

Figure 3-25E
Photograph facing north at location of proposed deceleration lane from Route 101 to Simpson Mill. Intertidal and Palustrine Wetlands between the existing railroad and highway would be impacted.

Cumulative Impacts

Cumulative impact of wetland and other Waters of the U.S. can potentially result from incremental impact of the proposed project when added to other past, present, and reasonably foreseeable public and private sector projects planned or underway in the vicinity of the Route 101 Eureka-Arcata corridor. Land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of wildlife predators.

Because a wetland impact database tallying wetland type/function/value of past, current, and reasonably foreseeable future projects in the Humboldt Bay watershed/Route 101 Eureka-Arcata Corridor is not available, it is not possible to specifically measure the cumulative impacts to existing wetland. However a list of recently completed and future projects with past and potential wetland impacts within the Humboldt Bay watershed/Route 101 Eureka-Arcata Corridor was compiled and includes the following:

Humboldt Bay Trail, Eureka To Arcata Segment (Part of the California Coastal Trail)

The Humboldt County Association of Governments in association with other public agencies and organizations have been meeting to discuss the feasibility of a separate multi-use trail between Eureka and Arcata. Some options include locating the trail between the existing North Coast Railroad bed and Route 101, locating the trail on the existing North Coast Railroad bed (adjacent to the existing Route 101 roadway) as well as placing the trail on the east side of Route 101. This trail, if constructed, would become part of the California Coastal Trail. Depending on the Alternative selected, permanent wetland impacts could result.

Caltrans Roadside Maintenance

Caltrans is proposing to conduct maintenance work that would remove excess vegetation from the ditches adjacent to Route 101 to minimize potential flooding. This would include the ditch east of Route 101, outside the BSA, that extends south of Bracut to its outlet into Eureka Slough at the tide gates near Airport Road. The construction activities of this project would temporarily affect wetland vegetation. No permanent effects to wetlands would be expected.

Old Arcata Road/ Myrtle Avenue Widening and Rehabilitation Project

Humboldt County is proposing to complete the widening and reconstruction of the Old Arcata Road/Myrtle Avenue from the Eureka city limits to the Arcata city limits. As reported in the Final Environmental Impact Report for this project, the project would affect 1.51 hectares (3.64 acres) of wetlands and 0.03 hectares (0.07 acre) of other Waters of the U.S. The use of mitigation credits available at the Fay Slough Wetland Mitigation Bank and onsite restoration would offset wetland impacts resulting from the project (County of Humboldt 2001).

Waterfront Drive Extension Project

The City of Eureka, with funding from FHWA, has proposed to extend Waterfront Drive in the City of Eureka between Del Norte Street to Hilfiker Lane. The project would likely affect wetlands within Humboldt Bay.

Humboldt Bay Bridges

Caltrans seismically retrofitted the existing bridge substructures of the Eureka Channel, Middle Channel, and Samoa Channel bridges on State Route 255. Construction was completed in the summer of 2006. Caltrans anticipated that 0.475 hectares (1.17 acres) of mudflats, 0.305 hectares (0.753 acre) of eelgrass habitat; and 0.012 hectares (.03 acre) of wetland were temporarily affected by the project. Permanent impacts to U.S. Army Corps jurisdictional wetlands, waters, or special aquatic sites were anticipated to be 0.107-hectare (0.0264-acre) of eelgrass habitat and 0.927- hectares (0.229-acre) of deep-water channel bottom. All impacts to wetlands were mitigated or are in the process of being mitigated.

Mad River Water Pipeline Rehabilitation Project

The Mad River Water Pipeline is an existing 24-in diameter steel pipeline that was constructed mostly in the late 1930s, mainly within land owned by the City of Eureka. The new pipeline was constructed along Old Arcata Road and Myrtle Avenue through the Indianola area. This project was complete and the pipeline was placed in service on November 19, 2003. According to the Environmental Impact Report, this project affected between 2.36 hectares (5.82 acres) and 10.49 hectares (25.42 acres) of wetlands. All impacts to wetlands were mitigated.

Cole Avenue Median Closure

Cole Avenue is the southernmost of the seven intersections along the expressway portion of the Route 101 corridor. The median was closed at this intersection and the acceleration and deceleration lanes were extended at Airport Road in 2004. Wetland permanently filled by this project was offset by wetland enhancement/creation.

Target Store Project

The City of Eureka has approved the replacement of the closed Montgomery Ward store on Route 101 with a Target store at the southern limit of the project BSA. This project was completed in October 2004. The project included buffer zones at Eureka Slough and an adjacent ditch.

Balloon Tract Development

A new commercial development has recently been proposed about two miles south of the proposed project on a 13.7-hectare (34-acre) undeveloped plot known as the Balloon Tract. This project may include wetland restoration.

Samoa Town Master Plan

The property owner of the Town of Samoa, Samoa Pacific Group, LLC, is proposing to redevelop the town. This development would include upgrading the existing town, including some of the existing infrastructure, and developing approximately 282 new residential units. All potential effects to wetlands would be mitigated.

Caltrans Drainage Improvement Project at Jacobs Avenue and Airport Road

Caltrans is proposing a project to install a new culvert to correct a recurring street flooding problem. The project could result in both temporary and permanent wetland effects. Measures to minimize harm to wetland will be required.

As described earlier in this wetland section, most of the wetlands potentially impacted by any one of the three Build Alternatives largely consist of narrow strips of low quality wetlands adjacent to the paved roadway. Alternative 3 would permanently impact 6.24 hectares (15.41 acres) of wetland, the most of the three Build Alternatives. The Route 101 Eureka-Arcata Corridor Improvement Project in combination with known projects that may contribute to a cumulative loss of wetland and other Waters of the U.S.

However, the ACOE and CCC have a no net wetland loss policy that requires each project to avoid and minimize impacts to wetlands and to mitigate for unavoidable impacts. In fact, many projects provide additional mitigation beyond the impact: this would result in a net increase in the total area of wetland/other Waters of the U.S. in the Humboldt Bay watershed/Route 101 Eureka-Arcata Corridor area. In addition, projects such as the Arcata Baylands Enhancement/Restoration Project would enhance and or restore wetland value and function. This enhancement project consists of acquiring the properties containing McDaniel Slough, Jacoby Creek, and Gannon Slough and its tributaries for enhancement and or restoration by the City of Arcata. The restoration and/or enhancement would be accomplished by modifying/removing existing tide gate(s) and constructing ponds. (Source: City of Arcata Design and Review Commission Meeting Agenda, June 14, 2006.) These properties are adjacent to both the Humboldt Bay National Wildlife Refuge lands and the Arcata Marsh and Wildlife Sanctuary. Acquisition of these lands would establish a continuous corridor of local, state and federally protected lands adjacent to Humboldt Bay, totaling more than 400 hectares (1,000 acres).

The Humboldt Bay watershed is approximately 578-km^2 (223-miles^2) extending to the foothills of the Coast Range. Although the watershed is not entirely composed of wetland and Waters of the U.S., the cumulative wetland impact of recently constructed and future planned projects represents a tiny fraction of the overall existing wetlands and Waters of the U.S. within the Humboldt Bay watershed.

Caltrans has coordinated with federal and state resource agencies to develop a conceptual mitigation plan to offset project wetland impacts (described in detail later in this section). Any one of the three Route 101 Eureka-Arcata Corridor Improvement Project Alternatives would include a net increase in wetland value and function in the Humboldt Bay watershed/Route 101 Eureka-Arcata Corridor areas after wetland mitigation is implemented. Combined with wetland mitigation to ensure no net loss for other recent projects impacting wetlands, a net increase in wetlands and Waters of the U.S. in the Humboldt Bay watershed/Route 101 would occur. This net increase would contribute to a reversal of the historic trend for loss of wetland in the Humboldt Bay area primarily caused by historic diking and filling of the bay.

For the above reasons, even if activities related to these projects were to occur in the same time frame as the Eureka to Arcata Route 101 Corridor Improvement Project, there is no potential for substantial adverse cumulative impacts to wetlands and Waters of the U.S. to occur.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Summary of Wetland Impact Avoidance Efforts

During initial project planning, four Eureka-Arcata corridor improvement project alternatives were recommended for programming in a Project Study Report. Two

alternatives included constructing new frontage roads, which would have incurred substantial wetland impacts. A subsequent Supplemental Project Study Report was approved which included recommending reducing the range of alternatives to be studied because of extensive environmental impacts and anticipated lack of support for high construction and mitigation costs. Alternatives which included frontage roads were dropped from further consideration primarily because of substantial added wetland and wildlife refuge impacts on both sides of Route 101 as well as the Eureka Slough. Wetland mitigation would not be feasible for wetland impacts resulting from frontage road construction. (For more information regarding the project alternative development process, see Chapter 2.)

After the PSR and Supplemental PSR were approved, Caltrans completed a Value Analysis Report in February 2002. The Value Analysis process included an analysis of alternatives proposed during the project initiation phase; developed possible viable alternatives; built consensus and resolved issues with project stakeholders and transportation partners; examined reducing costs as well as reducing life cycle costs; and validated the project Need and Purpose. The team then chose the best alternatives from the 75 initial ideas and further developed and analyzed those. Many of the alternatives, including those involving frontage roads, new slough crossings, and wider shoulders were dropped from further consideration because they did not meet Need and Purpose or did not meet Selection Criteria, which included wetland impacts.

The Value Analysis (VA) process produced two recommended alternatives, with one alternative that included three different interchange design options. Eventually, the compact diamond interchange was chosen and the other two design options were dropped from further consideration. The compact diamond interchange has the least wetland impact compared to the other interchange designs. In addition, the VA team concluded that dropping shoulder widening from the alternatives would be feasible and would further minimize wetland impacts.

The two alternatives would eventually be combined with proposed roadway rehabilitation improvements and a signal alternative. A roadway design exception was acquired to maintain existing curves north of the Eureka Slough Bridge, which further avoids wetland impacts. For Alternative 3, which includes signalization at Airport Road, adverse effects to the watercourse parallel to Route 101 would be minimized by incorporation of a retaining wall and completely spanning the slough for the realigned Airport Road intersection. Effects to the same watercourse would be minimized for all Build Alternatives for the proposed acceleration and deceleration lane improvement at Cole Avenue by widening and realigning to the roadway median. Finally, the overall project was shortened, which included dropping a proposal to realign the freeway at the north end of the project.

In order to reduce impacts to Waters of the U.S. and wetlands, it should be noted that replacing the existing southbound Jacoby Creek Bridge with a single span structure was considered but ultimately dropped as a feasible option. Because of geometric

constraints and the depth to span ratios needed for a single span structure, the bridge would encroach on the high water surface levels of Jacoby Creek from tides and storm events, thus restricting the channel flows. Alternatively, the roadway approaching a single span bridge would need to be raised by approximately 1.2-meter or four-feet to maintaining current vertical clearances. Raising the roadway would require additional fill to support the elevated roadway resulting in additional permanent wetland impact of approximately 0.4-hectare (one-acre) in addition to the wetland impacts already identified for the proposed bridge replacement.

The Jacoby Creek Bridge is anticipated to be a cast-in-place slab structure. The proposed bridge replacement would be a three-span (two abutments and two interior bent lines) configuration similar to the existing bridge. The span will likely need to be increased to 24.4-meter (eighty-feet) to avoid construction conflicts between the new abutments and the existing abutments and piles.

Conceptual Wetland Mitigation Plan

Wetland mitigation will be required for the proposed project. While some mitigation may be accomplished as part of the project within the existing Route 101 right-of-way, because the existing highway right-of-way is limited to the narrow strip along the highway, developing additional off-site wetland mitigation will be necessary. In an effort to identify potential mitigation properties for the proposed project within the greater project vicinity as well as to collaborate and build upon local and regional wetland restoration planning activities, Caltrans has had many discussions with various state and local agencies, land trusts, restoration professionals, and private landowners. This section is a summary of the draft conceptual wetland mitigation plan available for review at the Caltrans District 1 office. This plan is a scoping/planning document and is still subject to revision pursuant to coordination with the responsible resource agencies.

Wetland Mitigation Terminology

Debit is the area representing the loss of wetland functions resulting from the proposed project, while credit is the area representing the gain of wetland functions at a proposed compensatory mitigation site. Caltrans prepared a draft conceptual mitigation plan which proposes compensatory mitigation areas, or credit to debit ratios, for wetland impacts as well as mitigation strategies, design approaches, and feasibility information (described later in this section).

There are four basic mitigation strategies as described below:

1. In-kind, on-site. Mitigate for the same type of wetland at the same location.

2. Out-of-kind, on-site. Mitigate for a different type of wetland at the same location.

3. In-kind, off-site. Mitigate the same type of wetland at a different location.

4. Out-of-kind, off-site. Mitigate for a different type of wetland a different location.

Categories of compensatory wetland mitigation include:

1. Establishment – Creating wetland where none presently exists (results in a net gain of wetland acreage);

2. Restoration – Restoring the former natural or historic wetland functions to an existing former or degraded wetland; restoration is further defined to track net gain, as:

   i). Re-establishment - Rebuild former wetland (results in net gain of wetland area);

   ii). Rehabilitation - repair of natural or historic function of degraded wetland (results in gain in wetland function, not area).

3. Enhancement - manipulation of natural processes to improve specific function(s), or to change growth stage or composition of vegetation; undertaken for specific water quality improvement, flood retention or wildlife habitat (results in a change in wetland function but no gain in area); and

4. Protection/Maintenance - preservation (results in no gain in wetland area; used only in exceptional circumstances).

The following factors are considered when developing wetland compensatory mitigation strategy options. In general, the more favorable combination of factors that can be implemented as mitigation, the lower the credit to debit wetland mitigation ratio. The actual mitigation areas will be developed with public resource agencies during the permit application phase of the project.

- **Mitigation strategy.** The compensatory mitigation ratio would vary from lowest ratio for in-kind, on-site strategy to the highest for out-of-kind, off-site. A desirable mitigation area would be within the Humboldt Bay Area (HBA) coastal zone limits and adjacent to other conservation management areas with creation of the same wetland types that were affected by the project. If this is not possible, then sites outside of the HBA coastal zone limits would be considered. Preferably, the type of wetland affected will be what is replaced.

If site conditions are not suitable to replace a particular wetland type, then other wetland types will be considered.

- **The wetland value and function of impacted wetland compared to the value and function of proposed wetland mitigation.** As discussed in the previous Environmental Consequences Section, most of the wetlands potentially impacted generally consist of narrow strips of wetlands adjacent to the paved roadway over about twenty miles on both shoulders and along the edges of the median. These wetlands have relatively low functions and values because of their proximity to the Route 101 roadway, isolation from other wetlands, and the routine mowing of the area. These factors, in addition to their long, narrow shape, substantially limit their wildlife habitat value. In addition, they have low to moderate value for sediment/ toxicant retention. On the other hand, proposed wetland mitigation would likely consist of mostly mitigation at locations that would not be long and narrow; therefore, the proposed mitigation would yield much better wetland value and functions for such objectives as improved water quality, greater flood retention, and superior wildlife habitat. A smaller compensatory mitigation area, or credit to debit mitigation ratio, could be justified if mitigation involves expanding, enhancing, restoring, or protecting critical habitat for Federally listed threatened or endangered species. Critical habitat under the Federal Endangered Species Act is discussed in the Threatened and Endangered Species Section 3.3.5.

- **Timing of mitigation construction**. Implementing mitigation prior to, or concurrent with**,** project construction would minimize the temporal impacts of loss of wetland function and value for wetland impacted by the project. Temporal impacts result when a wetland is impacted and loses function and value over time until it is reestablished or is compensated off-site.

While mitigation in-kind and on-site is generally most favorable, in instances where higher quality wetlands with greater function and value can be achieved by replacement with either out-of-kind or off-site superior wetlands, it may be beneficial to do so. In such circumstances, because the replacement wetlands are of higher value than affected wetlands and even though mitigation may be off-site, or out of kind, a lower mitigation credit to debit ratio may be appropriate. At a minimum, the overall wetland mitigation objective of no net loss of wetland function and value when mitigation work is completed will be achieved.

Wetland Mitigation Considerations

In developing mitigation strategies for the proposed project, Caltrans has considered the following:

- In determining compensatory mitigation requirements, the USACE is directed to consider the needs of the watershed and the ecosystem in which wetland impacts will occur (Source: USACE Regulatory Guidance Letter 02-02).

- Determination of what is on-site mitigation versus off-site mitigation for impacts associated with the proposed project.

  Mitigation for wetland impacts could be implemented within the Humboldt Bay area (HBA) Coastal Zone limits to provide for on-site wetland mitigation. And/or, mitigate off-site.

- In assessing the appropriateness of the proposed compensatory mitigation, the USACE considers what wetland and/or aquatic functions are being lost and/or adversely modified (Source: USACE Regulatory Guidance Letter 02-02).

- The USACE encourages compensatory mitigation projects to include a mix of habitats such as open water, wetlands, and adjacent uplands (Source: USACE Regulatory Guidance Letter 02-02).

- Wetland establishment is an inherently difficult category of compensatory mitigation to successfully implement. Unless site conditions provide a significant measure of confidence, establishment may not be a preferable mitigation approach. Wetland restoration efforts may provide the best potential for success in terms of providing functional compensation for impacted aquatic resources and wetlands. Whether mitigation is establishment or restoration, each type of mitigation has utility and may be used as compensatory mitigation.

- Acquiring property to construct necessary project mitigation may be accomplished though actual purchase of fee title for a suitable property (with placement of a conservation easement or other in-perpetuity deed restriction for resource values), or through purchase of a conservation easement alone on a suitable property (resulting in permanent protection of mitigated resources).

Mitigation Strategies

Five conceptual mitigation strategies (A-E) are being considered and are described in this section. The strategies proposed (mitigation in or out-of-kind, on or off-site) make use of the acceptable categories of compensatory wetland mitigation (mitigation design approach), as defined in the USACE Regulatory Guidance Letter 02-02. Caltrans may utilize a single mitigation strategy and design approach or a combination of strategies and approaches to accomplish all necessary wetland mitigation for the project.

Estuarine Intertidal Wetland could be created through enhancement activities within the proposed project limits. This restoration could partially satisfy anticipated wetland mitigation requirements for the project, and could be accomplished as a part of the proposed project. This option is explored in strategy A (restore or enhance tidelands, on-site). For any other property(s) selected for use as a mitigation site, the following studies are likely to be necessary: preliminary wetland delineation, topographic surveys, and hydrologic studies. Other studies will be performed as necessary to establish compliance with the National Environmental Policy Act and the California Environmental Quality Act.

A. Restore or Enhance Tidelands; In-Kind, On-Site

This strategy will provide in-kind compensatory wetland mitigation (Estuarine Intertidal Wetland) exhibiting greater function and value than wetlands impacted by project construction. This wetland mitigation strategy consists of restoring or enhancing tidelands within the Humboldt Bay Area Coastal Zone limits (on-site). See Figure 3-26.

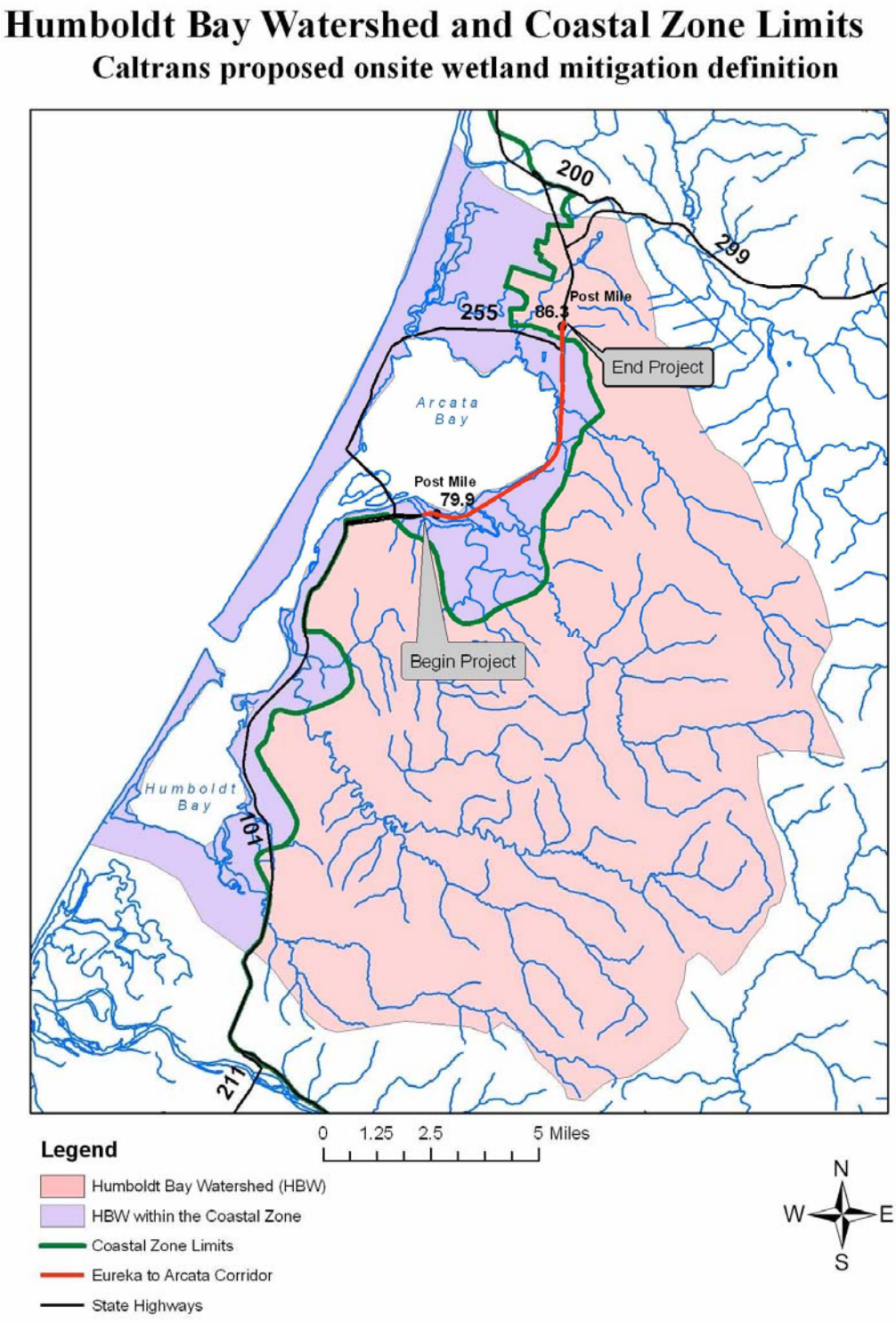

Humboldt Bay Watershed and Coastal Zone Limits
Caltrans proposed onsite wetland mitigation definition
200
299
255
Post Mile
86.3
End Project
Arcata Bay
Post Mile
79.9
Begin Project
Humboldt Bay
101
211
0 1.25 2.5 5 Miles
Legend
Humboldt Bay Watershed (HBW)
HBW within the Coastal Zone
Coastal Zone Limits
Eureka to Arcata Corridor
State Highways
N
W
E
S

Figure 3-26

This mitigation design approach would manipulate the physical, chemical or biological characteristics of a former tideland (thereby achieving re-establishment) or a degraded tideland (thereby achieving rehabilitation) such that the natural, historic function would be restored; or such that wetland functions would be improved for specific wetland values/functions such as water quality improvement, flood retention or wildlife habitat (thereby achieving enhancement).

Re-establishment of tidal hydrology will result in a gain of wetland area, while rehabilitation will provide for a net increase in wetland function and value. Enhancement will result in a change in wetland function (increase) but no gain in area.

Feasibility

Caltrans acquired a 14.6-hectares (36-acres) parcel (known as the Old Samoa parcel). The parcel is reclaimed (filled) former tideland, now in agricultural use, and is adjacent to the joint-proposed California Department of Fish and Game and City of Arcata - McDaniel Slough Wetland Enhancement Project (a project site of some 97-hectares or 240-acres). The Old Samoa parcel is likely to currently function as an agricultural wetland. (A delineation of jurisdictional wetlands has yet to be accomplished.) Caltrans is now exploring the use of this parcel to construct a mitigation site; this mitigation approach may include restoring tidal flow to re-establish historic wetland conditions.

Mitigation at the Old Samoa parcel would be constructed to meet wetland mitigation commitments for Caltrans projects other than the Eureka to Arcata Corridor project. However, if the parcel is built as a mitigation site, it is likely to provide surplus wetland mitigation credits. Excess credits may be applied to the Eureka to Arcata Corridor Improvement project.

Caltrans will continue to work with resource agencies to identify other off-site mitigation locations as needed.

Mitigation Design

This design approach would make use of a property that has historically been subjected to tidal influence or would make use of a degraded tidal wetland. At any selected property, results from wetland delineation and botanical studies, topographic surveys, and hydrologic studies will be used to determine design details for the mitigation project. It may be possible that at any one property more than one design approach could be utilized (i.e. both restoration and enhancement could be utilized to maximize the total compensatory mitigation available at one site).

Habitat types to be restored and/or enhanced could include Estuarine Intertidal Wetland and could potentially include freshwater wetland types ranging from USACE jurisdictional to less-than-three-parameter coastal wetlands, as well as riparian habitat and upland buffer.

Functions and values to be restored/enhanced through this mitigation option include groundwater discharge, increased sediment stabilization and toxicant retention, and nutrient removal/transformation, production export, increased wildlife diversity/abundance, and increased aquatic diversity/abundance. Further, this design approach allows for possible creation of Estuarine Intertidal Wetland habitat that may create critical habitat for federally threatened and endangered species (salmonids [*Oncorhychus* spp.] and tidewater goby) as well as potentially creating habitat for the following rare plant species: Humboldt Bay owl's clover (*Castilleja ambigua* ssp. *humboldtiensis*), Point Reyes birds-beak (*Cordylanthus maritimus* ssp. *palustris*), and Lyngbye's sedge (*Carex lyngbyei*).

If the property selected for mitigation is currently in industrial or commercial use, then extensive excavation is likely to be necessary. Regardless of current land use, to restore tidal flow at a selected property the installation of tide gates (or modification to existing) would likely be necessary, as well as some excavation and contouring of former slough channel. Depending on the site, levee (or berm) modification or removal may be necessary. Further, it may be necessary to construct a new levee to prevent saltwater intrusion onto adjacent properties.

Mitigation Success and Monitoring Criteria

Mitigation success and monitoring criteria will be dependent upon the category of compensation (design approach) undertaken, as well as individual site conditions. If multiple approaches are undertaken at a site, then multiple success and monitoring criteria may be necessary.

For re-establishment of tidelands to be successful as a mitigation design approach, the wetland mitigation property must meet the goal of restoring tidal influence to the property as well as restoring a predominance of native, salt-tolerant, hydrophytic plants (vegetation that grows partly or wholly in water) to the site. For rehabilitation of tidelands to be successful as a design approach, the mitigation property must meet the goal of repairing the natural function of the site. This is likely to include restoring a predominance of native salt-tolerant, hydrophytic vegetative cover. If the design approach is an enhancement of tidelands, then the goals (and determination of success) would be based upon either what functional improvements or vegetation changes were needed to achieve improvements to either water quality, flood retention or wildlife habitat.

Upon project design, a monitoring method will be selected that will best evaluate success criteria. For any mitigation property, obligatory monitoring reports to

resource agencies will be necessary. Mitigation monitoring plans will follow the Guidance provided by the USACE 2004 Mitigation and Monitoring Proposal Guidelines.

At the constructed mitigation site, prior to completion of a final monitoring report, a final wetland delineation will be performed to quantify and qualify restored wetland area in the mitigation area, thus ensuring that success criteria have been met. The delineation will be done in accordance with the 1987 USACE Wetlands Delineation Manual.

Proposed Mitigation Credits

Caltrans anticipates receiving mitigation credit for reestablishing USACE tidal wetland (creation of three-parameter wetland). The amount of credit for creation could be determined upon the results of the final wetland delineation.

Coastal wetland mitigation credit will be inclusive of any USACE credits that are developed, however coastal wetland mitigation also includes the restoration or enhancement of less-than-three parameter wetlands. Also, the California Coastal Commission (CCC) may credit mitigation that successfully restores tidally influenced wetlands even if habitat status is a less-than-three parameter wetland prior to tidal restoration (as this is viewed by the CCC as a significant restoration).

If it can be demonstrated that the inclusion of upland and/or riparian areas contribute to the overall ecologic function of the mitigation project, it is anticipated that the USACE and the CCC will grant credit for these areas as partial satisfaction of necessary wetland mitigation. (Note: riparian areas within the Coastal Zone are coastal wetland.)

B. Establish, Rehabilitate or Enhance Freshwater Wetlands; Out-of-Kind, On-Site

The mitigation design approach would either establish new freshwater wetlands (creation) or manipulate the characteristics of a degraded wetland such that the natural, historic function would be restored (achieving rehabilitation) within the Humboldt Bay Area Coastal Zone limits; or wetland functions would be improved for specific values/functions such as water quality improvement, flood retention or wildlife habitat (achieving enhancement). Establishment of freshwater wetlands will provide for a net increase in wetland area, while rehabilitation or enhancement of freshwater wetlands will result in a net increase in wetland function and value. This strategy will provide for out-of-kind, on-site compensatory wetland mitigation.

Feasibility

If built as a Caltrans mitigation property, the 14.6-hectare (36-acre) Old Samoa parcel could utilize a freshwater wetland restoration and establishment strategy. If built as a mitigation site, the parcel is likely to provide wetland mitigation credits in excess of those needed for Caltrans projects other than the Eureka to Arcata Corridor. Excess credits may be applied to the Eureka to Arcata Corridor Improvement project.

As is the case with the Old Samoa parcel, many agricultural as well as industrial and commercial properties within the Coastal Zone are situated on filled former tidelands. Such parcels may become available for sale. Conversion of agricultural and/or industrial, or commercial properties into restoration (mitigation) properties will continue to yield revenue for the area as well as provide for increased biological resource values.

Mitigation Design

It may be possible that at any one property more than one design approach could be utilized, thereby maximizing the total compensatory mitigation available at one site. For example, rehabilitation/enhancement could be utilized on a degraded wetland site with additional design for the establishment of new wetland on a more upland portion of a property.

The mitigation design approach would either construct new freshwater wetlands; or manipulate the existing conditions at a degraded wetland to restore historic function (rehabilitate); or enhance a degraded wetland for specific water quality improvement, flood retention, or wildlife habitat by manipulating existing natural processes to ensure that compensatory mitigation will be self-sustaining. At any selected property, results from wetland delineation and botanical studies, topographic surveys, and hydrologic studies will be used to determine design details for the mitigation project.

Habitat types benefiting from establishment, rehabilitation, or enhancement are likely to include wetland types ranging from USACE jurisdictional to less-than-three-parameter coastal wetlands, as well as riparian habitat and upland buffer. Functions and values benefiting from this mitigation option include groundwater recharge and discharge, increased flood flow attenuation, and increased sediment/toxicant retention. Wildlife and aquatic diversity and abundance may also benefit.

Mitigation Success and Monitoring Criteria

Mitigation success and monitoring criteria will be dependent upon the category of compensation (design approach) undertaken, as well as individual site conditions. If

multiple approaches are undertaken at a site, then multiple success and monitoring criteria may be necessary.

For establishment of freshwater wetland to be successful as a mitigation design approach, the mitigation property must meet the goal of restoring coastal wetland (including USACE wetland). Mitigation success includes demonstration of sufficient hydrology and wetland soils and a predominance of native, hydrophytic vegetative cover to the site.

For rehabilitation of a degraded freshwater wetland to be successful as a design approach, the mitigation property must meet the goal of repairing the natural function of the site. This is likely to include restoring a predominance of native, hydrophytic vegetative cover. If the design approach is an enhancement of freshwater wetland, then the goals (and determination of success) would be based upon either what functional improvements or what vegetation changes were needed, to achieve improvements to water quality, flood retention, or wildlife habitat.

Upon project design, a monitoring method will be selected that will best evaluate success criteria. Mitigation monitoring plans will follow the USACE 2004 Mitigation and Monitoring Proposal Guidelines. At the constructed mitigation parcel, prior to completion of a final monitoring report, a final wetland delineation will be performed to quantify and qualify restored and/or established wetland area in the mitigation area in order to ensure success criteria have been met.

Proposed Mitigation Credit

Caltrans anticipates receiving mitigation credit for creating USACE wetland (creation of three parameter wetland). Coastal wetland mitigation credit is inclusive of any USACE credits, but also includes the enhancement, rehabilitation, or creation of less-than-three parameter wetlands.

Caltrans anticipates that the USACE and the CCC will grant credit for the inclusion of upland and/or riparian areas, when it can be demonstrated that they contribute to the overall ecologic function of the mitigation project.

C. Restore or Enhance Tidelands; In-Kind, Off-Site

This strategy will provide for in-kind compensatory wetland mitigation (Estuarine Intertidal Wetland) exhibiting greater function and value than wetlands impacted by project construction. Off-site mitigation would be accomplished by restoring or enhancing tidelands outside the Humboldt Bay Area Coastal Zone.

This mitigation design approach is the same as for strategy A; with re-establishment of tidal hydrology resulting in a gain of wetland area, rehabilitation providing for a

net increase in wetland function and value, and enhancement resulting in a change in wetland function (increase) but no gain in area.

Feasibility

Recent Caltrans inquiries into properties potentially suitable for mitigation for the Eureka – Arcata Corridor Improvement project (as well as property searches to date) have been focused on properties within the Humboldt Bay Area Coastal Zone. However, it has been noted during this time period that large private parcels within adjacent watersheds have come onto the market.

As much of the historic tideland in the Humboldt Bay area has been reclaimed and converted, it is possible that parcels of former tidelands could be found for sale in the Eel River or Mad River watersheds. Conversion of these agricultural and/or industrial or commercial properties into restoration (mitigation) properties will continue to yield revenue for the area as well as provide for increased biological resource values.

Mitigation Design

The design approach here is the same as for strategy A; with habitat types to be restored and/or enhanced potentially including salt marsh and Estuarine Intertidal Wetland and possibly freshwater wetland types ranging from USACE jurisdictional to less-than-three-parameter coastal wetlands, as well as riparian habitat and upland buffer. Wetland function and value benefits and design details are as previously described for strategy A.

Mitigation Success and Monitoring Criteria

See strategy A, Mitigation Success and Monitoring Criteria.

Proposed Mitigation Credits

Proposed credit values for mitigation are the same as for strategy A.

D. Protect/Maintain (Preserve) Existing Wetlands

This strategy may or may not provide for in-kind wetland compensation (Estuarine Intertidal Wetland). This strategy may or may not provide mitigation within the Humboldt Bay Area Coastal Zone (on-site). This strategy does provide for the removal of threat to (or prevents the decline of) wetland conditions by an action in or

near a wetland. Protecting wetlands in such a manner may be accomplished through outright purchase of the property or through purchase of a conservation easement.

This strategy consists of protecting and maintaining self-sustaining, remaining wetlands that:

1. Exhibit high function and value; or that are habitat for Threatened and/or Endangered Species, or that are tidal in nature (dune hollow wetlands are also likely to be acceptable for this approach), and

2. That are under direct threat of development, or that are situated such that ensuring permanent protection of said wetlands will add to a corridor of conservation.

While it is also noted that the USACE accepts preservation of existing wetlands only under exceptional circumstances, the USACE Regulatory Guidance Letter 02-02 does recognize that natural wetlands may provide more practicable long-term ecological benefits than restored wetlands. The USACE Regulatory Guidance Letter 01-1 states that wetlands that are preserved as mitigation should be under a documented threat of development, which is the case for most privately held wetlands pursuant to Regulatory Guidance Letter 01-1.

Note: Pursuant to the USACE Regulatory Guidance Letter 02-02, mitigation credit for protecting existing wetlands (or other aquatic resources) that is done in conjunction with other wetland mitigation activities, may be granted by the USACE, if existing wetlands have adjacency to those being otherwise constructed for mitigation.

Feasibility

There may be parcels available which meet the criteria for this approach: a self-sustaining, remaining wetland that exhibits high function and value, or that is habitat for Threatened/Endangered Species, or that is tidal in nature; that is either under direct threat of development or that is situated such that ensuring permanent protection of said parcel will add to a corridor of conservation.

Mitigation Design

This approach would manage an existing property such that the existing wetland is preserved in perpetuity. This approach may include fencing for cattle exclusion and/or to prevent trespass or vandalism.

Habitat types benefiting from protection could include wetland types ranging from USACE jurisdictional to less-than-three-parameter coastal wetlands, as well as riparian habitat and upland buffer.

Functions and values benefiting from protection/preservation will be based upon specific site conditions, but are likely to include groundwater discharge, sediment stabilization and toxicant retention, and nutrient removal/transformation in order to increase diversity and abundance for both terrestrial and aquatic species.

Supplementary to a preservation approach, the property may benefit from other compensatory mitigation types. Wetland and botanical studies, topographic surveys, and hydrologic studies could be used to determine further potential design details that may benefit the mitigation project site. For tidal design details, see Strategy A; for freshwater design details, see Strategy B.

Mitigation Success and Monitoring Criteria

A preservation approach requires in-perpetuity management responsibilities but is unlikely to require success criteria.

If other categories of compensatory mitigation are also implemented at the site then appropriate mitigation success/monitoring criteria will be necessary depending on what further design approaches are implemented. For tidal success criteria see strategy A; for freshwater success criteria see strategy B.

Proposed Mitigation Credit

Caltrans anticipates receiving wetland mitigation credit for preserving USACE wetland. Caltrans anticipates that both the USACE and the CCC will grant credit for the inclusion of upland and/or riparian areas for preservation, if it can be demonstrated that they contribute to the overall ecologic function of the mitigation project. If additional compensatory mitigation approaches are used at a preservation site, proposed credits would fall into previously discussed categories.

E. Establish, Rehabilitate or Enhance Freshwater Wetlands; Out-of-Kind, Off-Site

This strategy consists of either establishing new freshwater wetlands, or rehabilitating or enhancing degraded freshwater wetlands on a property that is outside of the Humboldt Bay Area Coastal Zone. This strategy will provide out-of-kind, off-site compensatory wetland mitigation.

If mitigation is implemented outside the Coastal Zone limits, utilizing this strategy may require that all necessary wetland mitigation (impacts to USACE and other coastal wetland) be satisfied with USACE wetland mitigation credits.

Establishment of freshwater wetlands will provide for a net increase in wetland area, while rehabilitation or enhancement of freshwater wetlands will result in a net increase in wetland function and value.

Feasibility

Caltrans inquiries into potential mitigation properties as well as property searches have been focused on properties within the Coastal Zone, however, it has been noted during this time period that large private parcels outside the Coastal Zone have come onto the market. Suitable parcels may be available for sale in the future. Conversion of agricultural and/or industrial or commercial properties into restoration (mitigation) properties will continue to yield revenue for the area as well as providing for increased biological resource values.

Mitigation Design

Freshwater wetland mitigation design details area as previously described in strategy B.

Mitigation Success and Monitoring Criteria

See Strategy B, Mitigation Success and Monitoring Criteria.

Proposed Mitigation Credit

As this strategy proposes mitigation outside the Coastal Zone limits, utilizing it may require that all necessary wetland mitigation (USACE and CCC) be satisfied with USACE mitigation credits.

Caltrans anticipates receiving a lower (or more favorable) mitigation ratio creating USACE three parameter wetland. Caltrans anticipates receiving a higher (or less favorable) mitigation ratio for rehabilitating or enhancing USACE wetland.

Caltrans anticipates that the USACE and the CCC will grant credit for the inclusion of upland and/or riparian areas, if it can be demonstrated that they contribute to the overall ecologic function of the mitigation project.

Implementation

Caltrans would utilize a competitive bid process to provide for construction of a parcel(s) to meet Caltrans permitting (mitigation) needs for the Eureka to Arcata Route 101 Corridor Improvement Project. The bidder would be responsible for parcel acquisition, or conservation easement acquisition, as part of the bid package. The conceptual mitigation options prepared for the proposed project will be included with the bid package to outline potential mitigation strategies and design approaches.

The bid package (a Request for Proposal) will include provisions for all mitigation monitoring responsibilities, as well as in-perpetuity management of the site. It will be required that mitigation monitoring plans follow the USACE 2004 Mitigation and Monitoring Proposal Guidelines. The Request for Proposal (RFP) will include minimum qualifications for applicants. When acquiring mitigation necessary to meet project permitting needs through use of a bid process, Caltrans will use the credit system (by design approach) as outlined within this report, to calculate the amount of mitigation that is proposed to be created by individually submitted projects (bids).

As an alternative to approaching the RFP with a specific amount of compensatory wetland to be created, Caltrans would fund local wetland restoration projects commensurate to project related wetland impact. Caltrans would provide funding, select proposals (contracts), and provide oversight to ensure successful execution of the contracts. Utilizing this approach would be similar to an in-lieu fee program in that no minimum criteria would be utilized to determine mitigation success. Caltrans would receive no credits for any restoration area created in excess of that needed for the proposed project. Utilizing this dollar amount of wetland restoration proportional to wetland impact could easily result in a greater net gain in wetland acreage and function than creating compensatory mitigation using the credit acquired accounting system.

Use of a competitive bid process to construct mitigation property (s) is likely to draw much interest from the restoration community as it would provide an avenue of funding for projects, and it may even garner the interest of resource agencies seeking external funding sources for restoration projects. A competitive bid process is open to all applicants: public, private and non-profit.

Or, Caltrans would acquire a suitable parcel (this may be a conservation easement or acquisition of fee title as well as an in-perpetuity deed restriction for resource values), and either:

1. Utilize an RFP to construct mitigation as described above, or

2. Develop an interagency or cooperative agreement with a secondary agency that would include the construction or management of the parcel to meet Caltrans permitting (mitigation) needs. The agreement would also transfer all monitoring and management in-perpetuity responsibilities of the mitigation

site (as well as fee title, if applicable). Potential secondary agencies to partner with include, among others, the California Coastal Conservancy, and the City of Arcata.

Or, Caltrans could acquire title to a suitable parcel(s) and direct the mitigation construction itself, retaining title of and responsibility for the mitigation parcel in the short term, while pursuing the transfer of fee title and in-perpetuity management responsibilities at a later date to an organization such as a land trust.

Or, if a wetland mitigation bank is established and jurisdictional agencies agree to the use of the bank as appropriate compensatory mitigation for the proposed project, and if the cost to Caltrans for credits can be favorably compared to the estimated costs for compensatory mitigation utilizing an RFP, or other implementation method, then Caltrans may choose to buy credits at the bank to partially or wholly satisfy the mitigation requirements for the proposed project.

Wetland Mitigation Conclusion

For any of the three Build Alternatives, wetland mitigation will be required in accordance with the regulatory agencies having wetland jurisdiction. As described earlier in this wetland section, most of the wetlands potentially impacted by any one of the three Build Alternatives largely consist of narrow strips of low quality wetlands adjacent to the paved roadway.

On the other hand, whichever mitigation strategy, or combination of strategies, is ultimately selected and implemented, the wetland mitigation would likely occur at locations that would not be long and narrow; therefore, it would offer the potential for much better wetland value and function. Even though the permanent wetland impact could potentially be as high as 6.24 hectares or 15.41 acres for Alternative 3, the higher value mitigation described above can be accomplished for this and the other Build Alternatives to yield a net increase in wetland function and value.

3.3.3 Special Status Plant Species

REGULATORY SETTING

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to Threatened and Endangered Species; these are species that

are formally listed or proposed for listing as Endangered or Threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see Section 3.3.5 - Threatened and Endangered Species in this chapter for detailed information regarding these species.

This section discusses all other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for Federal Endangered Species Act can be found at 16 United States Code (USC), Section 1531, et. seq. and 50 Code of Federal Regulations Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code Section 2050, et. seq. Caltrans projects are also subject to the Native Plant Protection Act, found at Fish and Game Code Section 1900-1913, and the California Environmental Quality Act, Public Resources Code Sections 2100-21177.

AFFECTED ENVIRONMENT

Existing records of special status plant species occurrences were consulted prior to conducting field surveys to determine which species have the potential to occur in the Biological Study Area (BSA). The following sources were consulted:

- U.S. Fish and Wildlife Service (USFWS) species list for Fields Landing, McWhinney Creek, Arcata South, Arcata North, Eureka, Tyee City, Blue Lake, Korbel, Iaqua Buttes and Cannibal Island USGS 7.5 minute quadrangles dated June 14, 2006. This list is located in Appendix H.

- California Natural Diversity Data Base (CNDDB) (California Department of Fish and Game 2006) occurrence records from the Fields Landing, McWhinney Creek, Arcata South, Arcata North, Eureka, Tyee City, Blue Lake, Korbel, Iaqua Buttes and Cannibal Island USGS 7.5 minute quadrangles.

- California Native Plant Society (CNPS) Electronic Inventory (CNPS 2006) occurrence records from the Fields Landing, McWhinney Creek, Arcata South, Arcata North, Eureka, Tyee City, Blue Lake, Korbel, Iaqua Buttes and Cannibal Island USGS 7.5 minute quadrangles.

Based on the above sources, it was determined that suitable habitat for fourteen special status plant species is present within the BSA, thus requiring field surveys.

Focused rare plant surveys were conducted within the BSA to catalog all plant species and determine if any special status plants would be affected by the proposed project.

The plant surveys of the BSA were conducted by Caltrans consultant personnel from May 21 to 23, 2003 and July 2 to 4, 2003. The BSA was revised in 2005 and an additional survey was conducted on August 4, 2005 along this expanded southeastern section. Caltrans Biologist Gail Popham conducted additional plant surveys or previously unsurveyed areas in April and June 2006. The surveys were timed to coincide with the blooming periods for all of the rare plants that have the potential to occur in the BSA. The surveys were conducted according to CDFG protocol and in addition to surveying for special status plants, an inventory of the species present at the site was recorded. In addition, Stephanie Morrissette, a local botanist at Mad River Biologists, was consulted to determine if local known occurrences were present and if they were, when they were blooming.

For all plant surveys, the entire BSA was walked slowly and all plant species observed were identified and recorded. The BSA includes the shoulder of the south and northbound lanes of the Route 101 highway right-of-way and median. One direction was walked at a time and all standard safety measures for the work in the highway right-of-way were followed.

The May plant survey was timed to coincide with the blooming period for the coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*), bensoniella (*Bensoniella oregona)*, Thurber's reed grass *(Calamagrostis crassiglumis)*, flaccid sedge (*Carex leptalea*), Lyngbye's sedge (*Carex lyngbei*), meadow sedge (*Carex praticola*), Humboldt Bay owl's clover and marsh pea (*Lathyrus palustris*). These plants have the potential to occur in the BSA based on the proximity of known occurrences and the presence of habitats that are suitable for these species.

The July and early August surveys were timed to coincide with the optimal period for identification of plants that bloom during the summer, which may include: Thurber's reed grass *(Calamagrostis crassiglumis)*, flaccid sedge (*Carex leptalea*), Lyngbye's sedge (*Carex lyngbei*), meadow sedge (*Carex praticola*), deceiving sedge (*Carex saliniformis*), green sedge (*Carex viridula* var. *viridula*), Point Reyes bird's beak, running pine (*Lycopodium clavatum*), western lily (*Lilium occidentale*) and western sand spurrey (*Spergularia canadensis var. occidentalis*).

Portions of the BSA are regularly mowed, which could reduce the potential to detect some of the special status plant species. The following portions of the BSA had been recently mowed at the time of the July survey. The BSA had not yet been mowed during the May survey. The mowed areas include:

- The east shoulder of Route 101 was mowed at Airport Drive; and
- the median and shoulders of Route 101 was mowed from Bracut Industrial Park north to Jacoby Creek.

Additionally, construction was taking place in the Route 101 median in the vicinity of Airport Road and surveys could not be conducted in this area. The entire BSA was surveyed. Caltrans Biologist Gail Popham surveyed these areas in April and November 2005, and April and July 2006. The northern portion of the BSA (north of Jacoby Creek) was also surveyed at that time.

Survey Results

A list of plant species observed in the BSA in presented in Appendix G. No federally or state listed plant species were observed within the BSA. Humboldt Bay owl's clover and Point Reyes bird's beak, which are CNPS List 1B (see Regulatory Setting section for explanation of CNPS List 1B) plant species, were identified in the BSA during the May, July and August surveys. Approximately 350 Humboldt Bay owl's clover plants and 450 Point Reyes bird's beak plants were identified along the northeast margin of Eureka Slough and approximately 1,000 Humboldt Bay owl's clover plants and 830 Point Reyes bird's beak plants were identified west of the Route 101 right-of-way in Eureka Slough. A population of Humboldt Bay owl's-clover was also found in the BSA on the bank of Gannon Slough. Lyngbye's sedge, a California Native Plant Society (CNPS) List 2 plant, was found at the mouth of Jacoby Creek. No additional special status plant species were detected in these areas.

Based upon the existing records search, site reconnaissance, and surveys a list of special status plant species with the potential to occur in the BSA was developed (See Appendix G).

ENVIRONMENTAL CONSEQUENCES

Humboldt Bay owl's-clover was found in the BSA on the bank of Gannon Slough. This area will be protected as an Environmentally Sensitive Area and fenced prior to construction to avoid impact to these plants. Lyngbye's sedge was found at the mouth of Jacoby Creek. The bridge construction work at Jacoby Creek would have a minor impact on this population. Minimization measures will be employed. These minimization measures include the placement of protective pads on top of the stands of Lyngbye's sedge where equipment access is required to prevent the equipment tracks/wheels from rutting and compressing the soil and uprooting or destroying the sedges.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The general measures that would be implemented to avoid and minimize effects to all biological resources, discussed in Section 3.3.1, would be applicable to special status plant species. Specific avoidance and minimization measures would also be developed, as necessary, through coordination with the U.S. Army Corps of

Engineers, U.S. Fish and Wildlife Service, National Oceanic Atmospheric Administration - Fisheries, U.S. Environmental Protection Agency, California Department of Fish and Game and the California Coastal Commission.

Any adverse effects to special status plant species from implementation of Alternatives 1, 2, and 3 would be minimized by using the recommended general avoidance and minimization measures.

The Humboldt Bay owl's-clover was found in the BSA on the bank of Gannon Slough. This area will be an Environmentally Sensitive Area and fenced prior to construction to avoid impact to these plants.

Coordination with the California Department of Fish and Game has determined that adverse effects to Lyngbye's sedge at Jacoby Creek from bridge construction activities would not be significant if appropriate minimization measures are implemented. These minimization measures include the placement of protective metal/wood/rubber sheets on top of the stands of Lyngbye's sedge where equipment access is required; these pads will be large enough to prevent the equipment tracks/wheels from rutting and compressing the soil and uprooting or destroying the sedges. Alternative 7 would not result in impact to any special status plant. The bridge construction work at Jacoby Creek would have a minor impact on this population.

3.3.4 Animal Species

REGULATORY SETTING

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA Fisheries) and the California Department of Fish and Game (CDFG) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as Threatened or Endangered are discussed in Section 3.3.5 – Threatened and Endangered Species in this chapter. All other special-status animal species are discussed in this section, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

National Environmental Policy Act
Migratory Bird Treaty Act
Fish and Wildlife Coordination Act
Marine Mammal Protection Act

State laws and regulations pertaining to wildlife include the following:

California Environmental Quality Act
Sections 1601 – 1603 of the Fish and Game Code
Section 4150 and 4152 of the Fish and Game Code

AFFECTED ENVIRONMENT

The Humboldt Bay Area, which includes Arcata Bay, provides habitat for a large diversity of native aquatic and terrestrial animal species. The BSA is dominated by Route 101 and thus does not provide diverse and abundant habitat for wildlife species. The median and edges of the highway are vegetated and considered marginal for most species due to their proximity to the highway. While the potential for most of these species to occur in the BSA is low, mammal species present in the vicinity include Roosevelt elk, black-tailed deer, gray fox, coyote, raccoon, fisher, river otter, rodents, weasels, skunks, and bats. Bird species include waterfowl (e.g. ruddy duck), shorebirds (e.g. snowy egret, black crowned night heron), birds of prey (e.g. northern harrier), and songbirds (marsh wren, savannah sparrow). Between Eureka and Arcata, Route 101 discourages most wildlife, other than fish and birds, from crossing between Humboldt Bay and the area east of Route 101. There are no highway segments within the project construction limits that have a high wildlife collision rate or encompass an established wildlife corridor. Within the BSA, Eureka Slough could potentially serve as migration corridors for fish, such as salmon, that move between salt and freshwater to complete their life history. The slough also potentially provides resting and feeding habitat for migratory waterfowl and shorebirds. The drainage ditches on the east side of Route 101 immediate adjacent to the BSA potentially could serve as migration corridors for fish, and provide feeding habitat for migratory waterfowl and shorebirds. The brackish waters of the sloughs, drainage ditches, and the lower reaches of the streams provide potential habitat for special status species such as coastal cutthroat trout, southern Oregon/northern California Coho salmon, northern California steelhead, California Coastal Chinook salmon, and tidewater goby.

Based upon the existing records search, site reconnaissance, and surveys, it was determined that no focused surveys for special status animal species were necessary. The terrestrial habitats in the BSA have limited potential to support special status animal species due to regular disturbance from roadway maintenance activities such as mowing. None of the special status terrestrial animal species, with the exception of the California brown pelican, have been documented the BSA, and these species are not likely to occur because of the lack of suitable habitats. The California brown pelican does not breed in northern California; they forage over shallow- and deep-water habitats, and they roost on structures such as breakwaters and pilings that are not found in the BSA. Therefore, although California brown pelican occur in the project vicinity, they will only occur in the BSA in flight or when temporarily roosting.

Special status species such as tidewater goby, southern Oregon/northern California Coho salmon, California coastal Chinook salmon and coastal cutthroat trout, and red-legged frog are known to be present in the sloughs, streams, and ditches in the BSA. The proposed action is likely to directly or indirectly affect these aquatic species.

ENVIRONMENTAL CONSEQUENCES

The impacts of Alternatives 1, 2, and 3 to non-special status wildlife would consist of the loss of habitat that has marginal quality within the existing Route 101 right-of-way. Alternatives 2 and 3 would occupy a larger footprint than Alternative 1 and would therefore result in more habitat loss than Alternative 1. Alternative 3 would include a slightly larger footprint than Alternative 2 because of the vegetation removal and earthwork associated with the signalized intersection at Airport Road. The impacts of these alternatives would result in localized effects to species that utilize the BSA (e.g. snowy egret). The BSA is located at the edge of higher quality habitat. The Humboldt Bay National Wildlife Refuge, located to the west of the BSA, supports a large diversity of non-special status species. Alternatives 1, 2, and 3 would affect edges of potential habitat along the highway, but not areas of higher quality habitat. The project Build Alternatives would occur mostly in areas that are currently disturbed. The avoidance and minimization measures for wetlands and special status species, described above, would also apply to non-special status vegetation and wildlife. Alternatives 1, 2, and 3 would have minimal effects to the use of the BSA by wildlife. Eureka Slough provides a wildlife crossing underneath the freeway for fish, water birds, and other species that may utilize wetland and open water habitat. The potential for vehicle collisions with wildlife would not be substantially changed, as Route 101 and traffic already exist in the BSA. Birds may be nesting in trees and shrubs within the BSA.

Construction Noise

Due to current high traffic levels, most construction activity is not expected to contribute any substantial increase in disturbance to birds nesting in the BSA. However, project construction noise that exceeds the existing traffic noise such as pile driving and jack hammering would generate noise that may cause temporary displacement of wildlife. Noise impacts associated with the proposed project are addressed in Section 3.2.6 – Noise and in Section 3.3.5 – Threatened and Endangered Species of this chapter.

Alternative 7 would have no effect on non-special status vegetation and wildlife.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Standard construction practices will be implemented, which include noise minimization measures, to minimize noise effects on wildlife. For measures to minimize construction noise refer to Section 3.2.6 – Noise and in Section 3.3.5 – Threatened and Endangered Species of this chapter.

It is likely that migratory birds may be nesting in the BSA. To avoid adverse effects to migratory birds, the removal of any suitable nesting habitat (grasses, shrubs and trees) will take place between August 31 and March 1, outside the nesting season.

In addition to establishing and delineating Environmentally Sensitive Areas on project plans and specifications as discussed in Section 4.1, best management practices to minimize indirect impacts to special status fish, such as a reduction in water quality, include the following construction pollution, spill, and erosion guidelines:

> Construction will utilize Best Management Practices (BMPs, Caltrans Storm Water Quality Handbooks, 1997) to control silt and erosion of exposed soils. These practices consist of application of permanent and temporary construction treatments for controlling storm water runoff and preventing discharges of excessively turbid water from the job site. No concrete washings or water from concrete will be allowed to flow into the streams. No concrete will be poured within flowing water in the streams. Construction disturbance will be restricted to the minimum necessary for completion of the project. Staging areas, storage areas, and equipment parking will not occur within any watercourse bed, bank and channel. Measures will be taken to assure that no discharges from equipment operating in the ditches will get into the watercourse. In addition, any work in watercourses will be scheduled during the dry season, between June 15 and October 15, to eliminate erosion and sediment impacts.

3.3.5 Threatened and Endangered Species

REGULATORY SETTING

The primary federal law protecting Threatened and Endangered Species is the Federal Endangered Species Act (FESA): 16 United States Code (USC), Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of Endangered and Threatened species and the ecosystems upon which they depend. Under Section 7 of this Act, federal agencies, such as the Federal Highway Administration, are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) to

ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a Threatened or Endangered species. The outcome of consultation under Section 7 is a Biological Opinion and an Incidental Take Statement. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

The Amended Magnuson-Stevens Fishery Conservation and Management Act, also known as the Sustainable Fisheries Act (Public Law 104-297), requires all federal agencies to consult with the Secretary of Commerce on activities, or proposed activities authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat or EFH (Office of Habitat Conservation 1999). EFH applies only to fish covered by Fishery Management Plans. In the case of the Humboldt Bay watershed, the EFH provisions of the Sustainable Fisheries Act are designed to protect anadromous species* fisheries** habitat from being lost due to disturbance and degradation.

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, Endangered, and Threatened Species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The California Department of Fish and Game (CDFG) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an Endangered or Threatened Species. "Take" is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For the proposed project, if NOAA Fisheries issues a Biological Opinion for the Coho salmon pursuant to the Section 7 Endangered Species Act consultation, Caltrans would then request a Consistency Determination under Section 2080.1 of the Fish and Game Code from the CDFG.

* The term "anadromous species" means species of fish which spawn in fresh or estuarine waters and migrate to ocean waters.

** A Fishery is one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and any fishing for such stocks.

AFFECTED ENVIRONMENT

Existing records of special status animal species occurrences were consulted prior to conducting a site reconnaissance survey to determine which species have the potential to occur within the BSA. The following sources were consulted:

> USFWS species list for Fields Landing, McWhinney Creek, Arcata South, Arcata North, Eureka, Tyee City, Blue Lake, Korbel, Iaqua Buttes and Cannibal Island USGS 7.5 minute quadrangles dated November 19, 2002. See Appendix H for the complete species list.
>
> CNDDB (CDFG 2003) occurrence records from the Fields Landing, McWhinney Creek, Arcata South, Arcata North, Eureka, Tyee City, Blue Lake, Korbel, Iaqua Buttes and Cannibal Island USGS 7.5 minute quadrangles.

Based on the above sources, it was determined that no focused surveys for special status terrestrial animal species were necessary. (See Appendix H for State and Federal sensitive and listed species lists.) The terrestrial habitats in the BSA have limited potential to support special status animal species because of the proximity to Route 101 and regular disturbance from roadway maintenance activities such as mowing. None of the special status terrestrial animal species, with the exception of the California brown pelican, have been documented from the BSA and these species are not likely to occur because of the lack of suitable habitats.

The California Brown Pelican (*Pelecanus occidentalis californicus*) is state and federally listed as endangered. Population impacts to brown pelicans have been the result of pesticide-induced eggshell thinning, oil spills, over harvest of prey, and loss of post breeding roosting habitat. Rookery sites are of primary concern. However, Brown Pelicans do not breed in northern California and no rookery sites are present within the BSA. Brown Pelicans have a potential to occur in the BSA. These individuals would likely be non-breeding or immature birds. Pelicans forage over shallow- and deep-water habitats and roost on structures such as breakwaters and pilings. Therefore, although California brown pelican occur in the project vicinity, they would only occur in the BSA in flight or temporarily roosting.

Special status fish species such as tidewater goby, southern Oregon/northern California Coho salmon, California coastal Chinook salmon and coastal cutthroat trout are known to use the tributaries in Arcata and Humboldt Bay. Therefore, the sloughs, streams, and ditches located immediately adjacent to the BSA are potentially utilized by these fish species.

Tidewater Goby

The tidewater goby (*Eucyclogobius newberryi*) is a fish that is federally listed as endangered and is a State species of concern. It is a benthic or bottom dwelling species that inhabits shallow lagoons and the lower reaches of coastal streams where the water is brackish (salinities usually <10 parts per thousand) to fresh and slow moving or fairly still (Source: Miller and Lea 1972; Moyle 1976; Swift 1980; Wang 1982; Irwin and Soltz 1984). The presence of backwater, marshy habitats where they can avoid winter flood flows, is particularly important for their persistence in the lagoons. The loss or degradation of coastal salt marsh and coastal lagoon habitat due to coastal development projects is currently the major factor affecting tidewater goby populations. Individual tidewater goby populations have a high potential for extinction, because the populations are relatively small and isolated and most estuaries or lagoons are affected by human activity. Population extinctions can occur rapidly, given the goby's short life cycle and specialized habitat requirements.

This species is documented by the USFWS at a number of known locations within the BSA, including the mouth of Jacoby Creek, Gannon Slough, and the Route 101 slough (USFWS 2006). Surveys were conducted in a ditch adjacent to Jacobs Avenue in the southern part of the BSA by the USFWS in 2001. No tidewater gobies were found in this ditch. The work on Gannon Slough and Jacoby Creek bridges may adversely impact tidewater goby. Critical habitat for the tidewater goby has not been designated. Essential Fish Habitat (EFH) is not defined for this species.

Southern Oregon/Northern California Coho Salmon

The Southern Oregon/Northern California Coho salmon is federally listed as Threatened and listed as Threatened under the California Endangered Species Act. The NOAAF classifies and lists salmon and steelhead by Evolutionarily Significant Unit (ESU). "To be considered an ESU, a population or group of populations must (1) be substantially reproductively isolated from other populations, and (2) contribute substantially to the ecological or genetic diversity of the biological species" (Myers et al. 1998). Factors used in determining ESUs include spatial, temporal, and genetic isolation, maturation rates, and other life history traits.

The Southern Oregon/Northern California ESU includes Coho salmon (*Oncorhynchus kisutch*) from Cape Blanco in southern Oregon to Punta Gorda in northern California. Coho salmon are typically associated with small to moderately-sized coastal streams characterized by heavily forested watersheds; perennially-flowing reaches of cool water; dense riparian canopy; deep pools with abundant overhead and in stream cover, undercut banks, and gravel or cobble substrates. Rivers in this ESU have short duration of peak flows and relatively low flows compared to rivers farther north. Adult salmon typically begin the migration from the ocean to freshwater after heavy late-fall or winter rains breach the sand bars at the

mouths of coastal streams. Migration continues to March, generally peaking in December and January, with spawning occurring shortly after returning to the spawning ground. The Coho salmon in this ESU are at risk from agricultural and forestry practices, water diversions, urbanization, mining, severe flooding, and non-native, predatory fish (Weitkamp, et. al. 1995). This species is present in the tributaries to Arcata and Humboldt Bay.

Humboldt Bay, which includes Arcata Bay, and its tributaries are designated by NOAA Fisheries as critical habitat for Coho salmon. In addition, Humboldt Bay and its tributaries are designated as Essential Fish Habitat (EFH), pursuant to Section 305(b)(20) of the Magnuson-Stevens Fisheries Conservation and Management Act.

Coastal Steelhead

This Coastal Steelhead (*Oncorhynchus mykiss*) ESU is federally listed as Threatened and is a State Species of Concern. It occupies river basins from Redwood Creek in Humboldt County, California to the Gualala River, including the Mad River, which is north of Humboldt Bay in the project vicinity. Within the range of west coast steelhead, spawning migrations occur throughout the year, with seasonal peaks of activity; these runs are usually named for the season in which the peak occurs. Steelhead within this Evolutionarily Significant Unit (ESU) include winter and summer steelhead, including what is presently considered to be the southernmost population of summer steelhead, in the Middle Fork Eel River. In the Pacific Northwest, steelhead that enter fresh water between May and October are considered summer steelhead, and steelhead that enter fresh water between November and April are considered winter steelhead. The Northern California steelhead ESUs greatest threats come from poor land management practices that cause sedimentation and channel restructuring, genetic mixing from hatchery stock, and the non-native, predatory Sacramento squawfish (Busby et al. 1996).

Northern California steelhead is likely to occur in the BSA and may be adversely impacted by the bridge work at Jacoby Creek and Gannon Slough. The Northern California steelhead may also occur in the Route 101 slough located immediately adjacent to the BSA. Critical habitat for this species was withdrawn in 2002, and re-designated in 2006.

Chinook Salmon

The California Coastal Chinook salmon is Federally listed as Threatened and encompasses the California coast from Redwood Creek (Humboldt County) south to the Russian River including the Mad River, which is north of Humboldt Bay in the project vicinity. The Chinook Salmon is not State listed or a State Species of concern. Chinook salmon (*Oncorhynchus tshawytscha*) in this ESU exhibit an ocean-type life-history; the low flows, high temperatures, and barrier bars that develop in

smaller coastal rivers during the summer months block movement by anadromous fish and favor an ocean-type life. The majority of fish migrate to the ocean as sub yearlings. Adults return as three- and four-year-old fish, with a small proportion of five-year-olds. Fall-run upstream migration occurs from June through December with a peak in September and October. Spawning occurs from late-September through December with a peak in late-October. The Chinook salmon in this ESU are at-risk from agricultural and forestry practices, water diversions, urbanization, mining, and severe flooding.

The Mad River and Humboldt Bay are within the project vicinity and there is no potential that California Coastal Chinook salmon could occur in the BSA. The California Coastal Chinook salmon potentially occurs within the ditches located immediate adjacent to the BSA. Critical habitat for this species was withdrawn in 2002, and re-designated in 2006. No EFH habitat exists within the BSA.

Other Special Status Species

Coastal Cutthroat Trout

Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*) is a state species of special concern. This species occurs from the Eel River north along the coast to southeastern Alaska. It is anadramous (fish that breed in freshwater but live their adult life in the sea) and migration to the ocean peaks in May. Coastal Cutthroat Trout frequently stay close to shore or in areas of reduced salinity like river mouths. They return to freshwater streams in the late summer, fall, or winter of the year they go to sea. Cutthroat Trout exhibit the most variable range in migratory behavior to be found in the salmonid complex, perhaps because of the great varieties of habitats that they can occupy. They can be found in large river systems, small streams, tributaries, near shore marine waters, estuaries, sloughs, lagoons, bogs, ponds, and large lakes.

This species is present in all of the tributaries to Humboldt Bay, which includes Arcata Bay. This species may occur within the BSA within the ditches adjacent to Route 101, Eureka Slough, Jacoby Creek, and Gannon Slough.

Migratory Birds

Barn Swallows (*Hirundo rustica*) and Cliff Swallows (*Petrochelidon pyrrhonota*) may use Jacoby Creek Bridges for nesting. These birds are protected under the Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703-712) that prohibits the take of any migratory bird, their nests or eggs. Both species often use bridges as nest sites. They build mud nests that they attach to concrete piers or under bridge decks. Other species of migratory birds may be nesting in the trees and shrubs and other vegetation throughout the BSA.

Pacific Harbor Seal

The Pacific Harbor Seal (*Phoca vitulina richardsi*) is afforded protection under the federal Marine Mammal Protection Act. Pacific harbor seals use Arcata and Humboldt Bay year-round. Harbor seals haul out in groups ranging in size from a few individuals to several hundred seals. Habitats used as haul-out sites include tidal rocks, mudflats, sandbars, and sandy beaches. Haul-out sites are used consistently from year to year and are important habitats for harbor seals. Human disturbance of animals ashore may be one of the most important factors affecting harbor seal. Harbor seals come ashore for resting in between foraging trips and also come ashore during molt to help increase skin temperature and hair development. Females haul out when giving birth to pups and to allow the pups to suckle and rest. Haul-out sites, therefore, are critical habitats for harbor seals, and they probably choose these sites based on freedom from disturbance and potential predators, proximity to feeding areas and deeper water, stability of substrate, and visibility of approaching terrestrial predators. NOAA Fisheries guidelines specify 100-meters or 330 feet as the closest distance that persons can approach marine mammals without affecting behavior, which is considered a take under the Marine Mammal Protection Act.

There are no Pacific harbor seal haul-out sites within 1.6 km or one mile of the BSA recorded in the CNDDB (CNDDB 2005) or known by biologists with the Humboldt Bay National Wildlife Refuge (Smith, pers. comm.).

Survey Results

In August and September 2006, protocol tidewater goby surveys were conducted at Gannon Slough and the Route 101 slough. No new goby populations were found at this time. Previous surveys had found them at these locations within the BSA and at Jacoby Creek. A survey of the area behind the tide gate at Old Jacoby Creek found no gobies present.

Brown Pelicans have the potential to occur in Humboldt Bay adjacent to the BSA because their habitat is present. No individuals were observed in the BSA during plant surveys.

ENVIRONMENTAL CONSEQUENCES

In spite of the implementation of minimization measures discussed in Section 3.3.1 of this chapter, there may be direct or indirect impacts from the proposed action to special status fish species, since bridge construction work would occur directly in the sloughs, tributaries, drainage ditches, and other water bodies. The avoidance and minimization measures discussed previously in Section 3.3.1 – Natural Communities are intended to substantially reduce the amount of material entering aquatic habitats, thereby diminishing the potential for impacts to aquatic species.

The proposed bridge construction work within Jacoby Creek and Gannon Slough may involve temporary dewatering using cofferdams, excavation, and pile driving. For more information about the bridge construction activities, see Section 3.3.1 in this chapter. These activities will be described in detail as well as minimization and avoidance measures as part of the Endangered Species Act consultation with NOAA Fisheries, DFG, and the USFWS.

Brown Pelicans could potentially fly over or roost in the BSA but are not expected to be affected by the proposed project due to their transient occurrence in the BSA.

Since there are no known haul-out sites for Pacific Harbor Seals within 1.6 km or one mile of the BSA, the proposed action would not affect this species.

Potential Effects of Construction Noise

Project construction would generate noise that may cause temporary displacement of wildlife for Alternatives 1, 2, and 3. Construction noise levels that may affect wildlife are described based on average (Leq) and maximum (Lmax) noise levels (Table 3-31). The BSA has existing traffic noise. Although construction would temporarily increase these noise levels, the maximum noise increases due to construction activities are within the range of the maximum traffic noise. There is a potential for higher noise levels if pile driving is used in construction. These increased noise levels may result in additional displacement of wildlife. However, construction noise levels drop off at a rate of about six decibels (dBA) per doubling distance and ground absorption, shielding features, and atmospheric conditions could result in higher drop off rates.

Table 3-31
Noise Levels in dBA Near Route 101 During Construction Activities

Distance from Route 101 Near Lanes Feet	Noise Level from US 101 Traffic Leq (Lmax)	Noise Level from Construction Activities Leq (Lmax) [Lmax Pile Dr.]
50	72 (85-90)	80 (86) [105]
100	69 (80-85)	74 (80) [99]
200	65 (70-80)	68 (74) [93]
400	60 (65-70)	62 (68) [87]
800	56 (≤60)	55 (60) [80]

Temporary construction noise would not impact listed terrestrial species. There are no known rookery sites for California pelican in the BSA. Therefore, temporary construction noise may disrupt roosting, but would not affect their breeding efforts.

However, the noise generated by pile driving in watercourses may impact listed fish species that occur in the BSA. Exposure to abrupt, extreme changes in water pressure from pile driving can be harmful or fatal to fish. Injury sustained from these pressure changes is termed barotrauma. Noise levels of about 208 dB re:1 μPa_{peak} or more can have an adverse effect on fish (Source: Popper, A.N., T. Carlson, B. Southall and R. Gentry. 2006. Interim Criteria for Injury of Fish Exposed to Pile Driving Operations: A White Paper). Impact pile driving without mitigation of 460-mm (18-inch) CISS piles can make noise in excess of 200 dB re:1 μPa_{peak}. Please refer to the Caltrans Natural Environment Study for more information.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The potential for barotrauma from pile driving methods and other construction within or adjacent to watercourses will be minimize as follows:

- If possible, pile driving will be done when tides are low enough to expose the substrate (the watercourse bed, bank or channel bottom) to avoid in-water pile driving.

- Double-walled isolation casing and/or bubble rings may be placed in the channels of Gannon Slough and Jacoby Creek prior to the driving of piles within the waterways to reduce noise levels. Noise data collected by in water from a diesel pile hammer driving of 610-mm (24-inch) diameter steel piles in isolation casings in water less than one-meter (3.3-feet) deep range from 179 to 183 dB re:1 μPa_{peak} at 18 meters or 59 feet (Source: Reyff, J.A. 2006. Russian River Replacement Bridge at Geyserville Underwater Sound Measurement Data for Driving of Steel Piles for the Construction of a Temporary Trestle. Unpublished report prepared for California Department of Transportation). The proposed project would require driving smaller diameter 457-mm (18-inch) diameter cast in steel shell piles with double-walled isolation casings which would likely have noise levels less than 183 dB re:1 μPa_{peak}.

- Minimization measures such as silt curtains within the active channel may be used to reduce sedimentation.

Details of minimization and avoidance measures will be determined with input from NOAA Fisheries, DFG, and the USFWS and will be included as a part of the Endangered Species consultation process. Additional conditions will be included in permits issued by resource agencies.

Tide gates will be replaced at low tide so no there will be negligible impacts to fishes and water quality.

Construction best management practices (BMPs) will be implemented to minimize impacts to water quality and special status fish by minimizing or avoiding siltation

and erosion of exposed soils. These practices consist of application of permanent and temporary construction treatments for controlling storm water runoff and preventing discharges of excessively turbid water from the job site. The applicable BMPs include the following:

- No concrete washings or water from concrete will be allowed to flow into the streams. No concrete will be poured within flowing water in the streams.

- Construction disturbance will be restricted to the minimum necessary for completion of the project.

- Staging areas, storage areas and equipment parking will not occur within any watercourse bed, bank and channel.

- Measures will be taken to assure that no discharges from equipment operating in the ditches will get into the watercourse. Leaky equipment may be placed on pads underlain with plastic sheeting (Visqueen) that would absorb any fueling spillage or be a barrier for any spillage.

- Silt fences will be placed the limits of construction in order to eliminate potential impacts to fisheries and other aquatic resources that potentially occur within these sensitive areas.

- Construction within this area will likely be scheduled during the dry season, typically between June 1 and October 15, to minimize the potential for erosion and sediment impacts. Bridge construction work may be year round.

The replacement of some of the existing tide gates with fish-friendly tide gates is an additional measure Caltrans is employing to minimize impacts to listed fish species.

To minimize noise effects on wildlife, Caltrans will implement standard construction practices, which include noise minimization measures. See Section 3.2.7 in this Chapter for more information.

To avoid impacts to cliff and barn swallows in compliance with the Migratory Bird Treaty Act, measures such as exclusionary netting or nest removal every 2-3 days will be implemented in during the breeding season (March 1 – September 1). It is likely that other species of migratory birds may be nesting in the BSA. To avoid adverse effects to these birds, the removal of any suitable nesting habitat (grasses, shrubs and trees) will take place between September 1st and March 1st, outside the nesting season.

3.3.6 Invasive Species

REGULATORY SETTING

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

AFFECTED ENVIRONMENT

The following invasive plant species were observed in the BSA:

TABLE 3-32
Invasive Plant Species List

Scientific Name	Common Name	Cal-EPPC List[1]	CNPS List[2]
Cirsium vulgare	bull thistle	B	Invasive A-list
Conium maculatum	poison hemlock	B	Invasive B-list
Cortaderia jubata	pampas grass	A-1	Invasive A-list
Digitalis purpurea	foxglove	Not listed	Invasive B-list
Dipsacus folllonum	wild teasel	Not listed	Invasive B-list
Eucalyptus globulus	blue gum eucalyptus	A-1	Not listed
Erica lusitanica	Spanish heath	Not listed	Invasive A-list
Lotus corniculatus	bird's foot trefoil	Not listed	Invasive B-list
Mentha pulegium	pennyroyal	A-2	Invasive B-list
Phragmites australis	common reed	Not listed	Invasive A-list
Pittosporum sp.	pittosporum	Not listed	Invasive B-list
Rubus discolor	Himalayan blackberry	A-1	Invasive A-list
Spartina densiflora	Chilean cordgrass	A-2	Invasive A-list
Vinca major	greater periwinkle	B	Invasive B-list

[1]Cal-EPPC (California Exotic Pest Plant Council) Listings:
List A: Most Invasive Wildland Pest Plants; documented as aggressive invaders that displace natives and disrupt natural habitats. Includes two sub-lists;
List A-1: Widespread pests that are invasive in more than 3 Jepson regions and
List A-2: Regional pests invasive in 3 or fewer Jepson regions.
List B: Wildland Pest Plants of Lesser Invasiveness; invasive pest plants that spread less rapidly and cause a lesser degree of habitat disruption; may be widespread or regional.

[2]CNPS (California Native PLANT Society) Invasive Weeds Listings:
"A-list" plants are those that have proven most harmful, and which are the target of most eradication efforts.
"B-list" consists of species which have not yet and may never have quite the magnitude of impact of A-list species, but are or have the potential to become a major problem. Each plant description lists ways to remove and control these species.

Himalayan blackberry was found widely distributed on the project site and is listed as a California Exotic Pest Plant Council (Cal-EPPC) List A invasive weed. The A-List is comprised of weed species that have been documented as aggressive invaders;

displacing natives and disrupting natural habitats. Caltrans has determined that it would be impracticable to attempt to eradicate Himalayan blackberry at this site, as the species is widespread in the project area and birds commonly use the roadside shrubs (and spread seed). Small, scattered occurrences of additional A- List species such as bull thistle (*Cirsium vulgare*), pampas grass (*Cortaderia jubata*), and Chilean cordgrass (*Spartina densiflora*) can be found in the project area.

The Roadside Management Unit of Caltrans Maintenance Division has been actively controlling invasive plants within the ROW in the Eureka Arcata Corridor. Most of the effort has focused on pampas grass and has been going on for a number of years. It involves digging up new growth annually. Labor is provided by California Conservation Corps and inmate crews.

There is a localized population of the CNPS Invasive A-List Common reed (*Phragmites australis*) within the Caltrans ROW on the east side of Route 101 adjacent to Resale Lumber Products (4056 N. Hwy 101) near Bracut. Caltrans is working with the Humboldt County Weed Management Area to control this *Phragmites* population (this work is not included as part of the overall Eureka-Arcata Corridor Improvement project). The plants will be cut off to soil level, and then a heavy black tarp will be placed over the infestation for the summer (six months). This is intended to kill the plants by denying them access to sunlight.

B-List species including periwinkle (*Vinca major*), poison hemlock (*Conium maculatum*), foxglove (*Digitalis purpurea*), fennel (*Foeniculum vulgare*), teasel (*Dipsacus folllonum*), pennyroyal (*Mentha pulegium*), and birdsfoot trefoil (*Lotus corniculatus*) can be found throughout the project area. These species are found on the Cal-IPC List B. List B is comprised of invasive pest plants that spread less rapidly and cause a lesser degree of habitat disruption (v. List A). It would not be practical to attempt to eradicate these plants in the BSA, as the species are widespread within and around the project area and would quickly reestablish.

ENVIRONMENTAL CONSEQUENCES

Approximately 350 mature blue gum eucalyptus trees (with diameters of over 60-centimeters or 24 inches) on the west side of Route 101 would be removed for the proposed acceleration/deceleration lanes at the Simpson Mill. Although blue gum eucalyptus is not listed on the CNPS List of Invasive Weeds of Humboldt County, it is listed on California Exotic Pest Plant Council's (CalEPPC) List as A-1: Most Invasive Wildland Pest Plants; Widespread.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

To reduce the spread of invasive non-native plant species Caltrans may implement the protection measures in compliance with Executive Order (EO) 13112, to the greatest degree possible, as described below.

Excess excavated soil and plant materials will be disposed of at an upland location where it cannot be washed into any watercourse. The disposal will be in compliance with all county and local regulations. Plant species used for erosion control will consist of native, non-invasive species or non-persistent hybrids that will serve to stabilize site conditions and prevent invasive species from colonizing.

Gravel and/or fill material to be placed in relatively weed-free areas will come from weed free sources. Certified weed-free imported materials (or rice straw in upland areas) will be used.

If invasive weeds in areas that were disturbed by project activities show evidence of spreading, Caltrans will develop an Invasive Weed Eradication Plan, targeting identified invasive species on the CDFA list. Herbicides would not be used since Caltrans does not use herbicides in Mendocino County or in most of Humboldt County. Implementation of these measures would avoid invasive plant impacts.

For more information about Eucalyptus tree removal and replanting trees, see Section 3.1.7 in this chapter.

Areas of tree removal will be replanted with locally native tree and shrub species.

3.4 - Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Project implementation of any of the Build Alternatives would result in attainment of short-term and long-term benefits at the expense of short and long-term social, aesthetic, biological, air, energy, water quality, and noise effects.

All three Build Alternatives would result in short-term (approximately three years or less) adverse effects during project construction, including:

- Increase in noise levels from construction activities – see Section 3.2.6 in this chapter for more information;

- Removing 200 to 300 mature trees on both sides of Route 101 for the construction of acceleration and deceleration lanes; interchange construction; and maintaining a clear recovery zone for errant vehicles;

- Traffic delays and detours from construction activities – see Section 3.1.6 in this chapter for more information;

- Energy and construction materials consumed – see Section 3.2.7 in this chapter for more information;

- Increase in dust, air pollution from construction activities – see Section 3.2.5 in this chapter for more information;

- The temporary wetland disturbance – see Section 3.3.2 in this chapter for more information;

- Potential for temporary interruption of utilities and emergency vehicle response during construction activities – see Section 3.1.5 in this chapter for more information;

- Temporary water quality degradation – see Section 3.2.2 in this chapter for more information;

Short-term benefits include increased jobs and revenue generated during construction for any of the Build Alternatives.

Long-term project adverse effects from construction of any of the Build Alternatives would include:

- Economic losses experienced by businesses affected by access restrictions – see Section 3.1.1 in this chapter for more information;

- Environmental Justice impacts experienced by low-income residents along the Route 101 corridor affected by access restrictions – see Section 3.1.4 in this chapter for more information;

- Visual impacts from loss of open space and trees; Alternatives 2 and 3 include constructing a new interchange at Indianola Cutoff – see Section 3.1.7 in this chapter for more information;

- Noise increases resulting from higher traffic speeds – see Section 3.2.6 in this chapter for more information;

- Fuel consumption beyond the No-Build condition resulting from out-of-direction travel – see Section 3.2.7 in this chapter for more information;

- The removal of up to 300 trees; Alternatives 2 and 3 would remove an additional 25 trees to construct the interchange – see Section 3.1.7 in this chapter for more information;

- Wetland Impacts are shown in Table 3-29.

Long-term gains derived from construction of any of the Build Alternatives include:

- Improvement of the transportation network of the region and the project vicinity – see Section 3.1.7 in this chapter for more information;

- Enhanced traffic safety and improved Level-of-Service at intersections resulting from the project would benefit businesses and residents within the corridor– see Section 3.1.1 in Chapter 3 for more information;

- Wetland enhancement – see Section 3.3.2 in this chapter for more information;

- Tree/shrub planting – see Section 3.1.7 in this chapter for more information;

- Aesthetic design features for the proposed interchange and bridge improvements – see Section 3.1.7 in this chapter for more information.

Overall, this project is based on local, regional, and state comprehensive transportation planning that considers the need for present and future traffic safety enhancement and long-term roadway maintenance for a critical transportation corridor. In such a situation, local short-term effects and use of resources by the proposed action are consistent with the maintenance and enhancement of long-term productivity for the region: this translates into increased long-term productivity of the transportation system on a local and regional level, with improved movement of people, goods, and services.

The No-Build Alternative would provide none of the gains or have the losses listed above. However, the proposed project would not achieve the project Need and Purpose of enhancing safety, improving long-term traffic level of service, and enhancing long-term roadway maintenance of the Route 101 corridor. In addition, based on Route 101 traffic trends between Eureka and Arcata, both vehicle speeds and volumes on Route 101 are predicted to increase: consequently in the foreseeable future, deteriorating highway conditions will likely necessitate closing one or more Route 101 median openings to maintain safety and minimize collisions. One or more median closures would restrict access to businesses and residences and result in out-of-direction travel; increased energy consumption and travel delay and the Level-of-Service on Old Arcata Road could substantially degrade.

3.5 - Irreversible and Irretrievable Commitments of Resources That Would Be Involved In the Proposed Action

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time-period that the land is used for highway improvements. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended. Additionally, large amounts of labor and natural resources are used in the making of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds, which are not retrievable; savings in energy, time, and a reduction in collisions would offset this. In addition to the costs of construction and right-of-way would be costs for roadway maintenance, including pavement, roadside, litter/sweeping, signs and markers, electrical and storm maintenance.

The commitment of these resources is based on the concept that residents and businesses in the immediate area, region, and state would benefit from the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, which are expected to outweigh the commitment of these resources.

Chapter 4 California Environmental Quality Act Evaluation

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency or public agency responsible for preparing an environmental document to comply with CEQA regulations and the FHWA is the lead agency to comply with NEPA regulations.

One difference between NEPA and CEQA is that CEQA must address climate change (i.e. global warming). The following section discusses this issue.

Climate Change

Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas[2] (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-17-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

[2] Greenhouse gases related to human activity include: Carbon dioxide, Methane, Nitrous oxide, Tetrafluoromethane, Hexafluoroethane, Sulfur hexafluoride, HFC-23, HFC-134a*, and HFC-152a*.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change.

According to a recent white paper by the Association of Environmental Professionals[3], an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the *Climate Action Program at Caltrans* (December 2006).

One of the main strategies in the Caltrans Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions.

Caltrans recognizes the concern that carbon dioxide emissions raise for climate change. However, modeling and gauging the impacts associated with an increase in GHG emissions levels, including carbon dioxide, at the project level is not currently possible. No federal, state or regional regulatory agency has provided methodology or criteria for GHG emission and climate change impact analysis. Therefore, the Caltrans is unable to provide a scientific or regulatory based conclusion regarding whether the project's contribution to climate change is cumulatively considerable.

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement AB 1493 and AB 32. As part of the *Climate Action Program at Caltrans* (December 2006), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-

[3] Hendrix, Michael and Wilson, Cori. *Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), p. 2.

duty trucks. However it is important to note that the control of the fuel economy standards is held by the United States Environmental Protection Agency and ARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California Davis.

Significance Determination

In addition to addressing climate change, one of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or some lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The NEPA determination of significance is based on context and intensity; CEQA is based on a similar concept—the environmental setting. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, the impact magnitude is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. This chapter discusses the effects of this project and CEQA significance.

Significant Environmental Effects of the Proposed Project

Without mitigation or measures to minimize harm implemented, the following are potentially significant impacts of the three project Build Alternatives:

- Economic losses experienced by businesses affected by access restrictions– see Section 3.1.1 in Chapter 3 for more information;

- Residents on Jacobs Avenue would experience delay and out-of-direction travel by access restrictions– see Section 3.1.1 in Chapter 3 for more information;

- Visual impacts from loss of open space and trees; Alternative 2 and 3 would involve constructing a new interchange and removal of trees within the roadway median – see Section 3.1.7 in Chapter 3 for more information;

- Fuel consumption beyond the No-Build condition resulting from out-of-direction travel – see Section 3.2.7 in Chapter 3 for more information;

- The removal of up to 400 trees on both sides of Route 101 – see Sections 3.1.7 and 3.3.1 in Chapter 3 for more information;

- The permanent filling of up to 6.24 hectares or 15.41 acres of wetlands – see Section 3.3.2 in Chapter 3 for more information;

- Temporary water quality degradation – see Section 3.2.2 in Chapter 3 for more information;

- And reduce the number or restrict the range of an Endangered, Rare or Threatened species. See Section 3.3.2 in Chapter 3 for more information.

- Project construction emissions (e.g. dust) result in nuisance or contribute to area-wide nonattainment. See Section 3.2.5 in Chapter 3 for more information.

Unavoidable Significant Environmental Effects

Depending on the project alternative, the following project impacts would remain significant even after mitigation measures are taken:

- Potential economic losses experienced by businesses affected by access restrictions– see Section 3.1.1 in Chapter 3 for more information;

- Residents on Jacobs Avenue would experience delay and out-of-direction travel by access restrictions– see Section 3.1.1 in Chapter 3 for more information;

- Fuel consumption beyond the No-Build condition resulting from out-of-direction travel – see Section 3.2.7 in Chapter 3 for more information;

- The removal of approximately 300 eucalyptus trees on the west side of the roadway. Alternatives 2 and 3 would remove an additional 25 trees to construct the interchange – see Sections 3.1.7 and 3.3.1 in Chapter 3 for more information;

Significant Irreversible Environmental Changes

The No-Build Alternative would not directly involve the use of resources. The Build Alternatives would involve the commitment of a range of natural, physical, human, and fiscal resources.

Uses of nonrenewable resources such as during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or non-use thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as a highway improvement that provides access to a previously inaccessible area) generally commit future generations to similar uses. Irreversible damage can also result from environmental accidents associated with the project.

All of the replacement alternatives would affect habitat areas, special aquatic sites, and vegetation to some extent. Mitigation measures would be implemented, but creation/restoration sites may not be in the project area.

Considerable amounts of fossil fuels, labor, and construction materials (such as cement, aggregate, steel) would be expended. Workers are expected to be drawn from the regional labor pool.

Additionally, labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply, and their use would not have an adverse effect upon continued availability of these resources.

The Build Alternatives would require a substantial expenditure of funds, which would not be retrievable.

The commitment of these resources is based on the concept that the Eureka-Arcata region would benefit from an enhanced major transportation corridor, which would outweigh the commitment of these resources.

For more information, please refer to discussions in Sections 3.4 and 3.5 in Chapter 3 regarding short-term uses versus maintenance and enhancement of long-term productivity and irreversible and irretrievable commitments.

Mitigation Measures For Significant Impacts Under CEQA

The following are proposed avoidance, minimization and/or mitigation measures included in this project for significant impacts listed above.

In order to minimize tree removal, trees will be evaluated in terms of safety enhancement, landscape maintenance, and aesthetic considerations as a basis for deciding tree removal or preservation. Tree, shrub planting to offset tree removal – see Section 3.1.7 in Chapter 3 for more information;

Enhance, restore, and create wetlands – see Section 3.3.2 in Chapter 3 for more information.

Adhere to construction work windows, abate pile-driving noise, identify and implement appropriate best management practices to avoid adversely affecting Endangered, Rare or Threatened Species. In addition, habitat enhancement measures are proposed including installing "fish friendly" tide gates and restoring brackish water to a watercourse adjacent to Route 101– see Section 3.3.2 in Chapter 3 for more information.

The following checklist identifies the physical, biological, social, and economic factors that might be affected by the four alternatives. For each question in the checklist, a number representing the alternative is listed under the appropriate checklist heading. For example, the first question under the topic Aesthetics indicates Alternatives 2 and 3 would have a potentially significant impact; Alternative 1 would have a less than significant impact; and Alternative 7 (No-Build) Alternative would have no impact. "A" indicates all four alternatives would apply under the specific heading. See Chapter 2 – Project Alternatives for a detailed description of each alternative.

Even though the No-Build Alternative does not include any proposed roadway changes, traffic volumes and speeds are expected to increase in the future, which would likely necessitate closing one or more Route 101 median openings within the corridor. Closing one or more medians could potentially restrict access to businesses and residents; add out-of-direction travel and delay; increase fuel consumption; adversely affect the Level-of-Service of local streets as well as State Route 255. For the purpose of completing this checklist, however, the No-Build Alternative describes the existing highway condition.

Supporting documentation of all CEQA checklist determinations is provided in Chapter 3 of this Environmental Impact Report/Environmental Impact Statement.

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
AESTHETICS - Would the project:				
a) Have a substantial adverse effect on a scenic vista?	1,2,3			7
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?	1,2,3			7
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	1,2,3			7
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			1.2,3	7
AGRICULTURE RESOURCES - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				A
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				A
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				A
AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			1,2,3	7

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			1,2,3	7
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			1,2,3	7
d) Expose sensitive receptors to substantial pollutant concentration?			1,2,3	7
e) Create objectionable odors affecting a substantial number of people?			1,2,3	7
BIOLOGICAL RESOURCES - Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		1,2,3		7
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		1,2,3		7
C) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		1,2,3		7
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		1,2,3		7
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		1,2,3		7

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?			1,2,3	7
COMMUNITY RESOURCES - Would the project:				
a) Cause disruption of orderly planned development?			1,2,3	7
b) Be inconsistent with a Coastal Zone Management Plan?		1,2,3		7
c) Affect lifestyles or neighborhood character or stability?			1,2,3	7
d) Physically divide an established community?				A
e) Affect minority, low-income, elderly, disabled, transit-dependent, or other specific interest group?	1,2,3			7
f) Affect employment, industry, or commerce, or require the displacement of businesses or farms?	1,2,3			7
g) Affect property values or the local tax base?			1,2,3	7
h) Affect any community facilities (including medical, educational, scientific, or religious institutions, ceremonial sites or sacred shrines?			1,2,3	7
i) Result in alterations to waterborne, rail, or air traffic?				A
j) Support large commercial or residential development?			1,2,3	7
k) Affect wild or scenic rivers or natural landmarks?				A
l) Result in substantial impacts associated with construction activities (e.g., noise, dust, temporary drainage, traffic detours, and temporary access, etc.)?		1,2,3		7
CULTURAL RESOURCES - Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				A

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				A
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				A
d) Disturb any human remains, including those interred outside of formal cemeteries?				A
GEOLOGY AND SOILS - Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:		1,2,3		7
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.		1,2,3		7
ii) Strong seismic ground shaking?		1,2,3		7
iii) Seismic-related ground failure, including liquefaction?		1,2,3		7
iv) Landslides?				A
b) Result in substantial soil erosion or the loss of topsoil?			1,2,3	7
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		1,2,3		7
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.				A
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				A

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
HAZARDS AND HAZARDOUS MATERIALS - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			1,2,3	7
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			1,2,3	7
c) Emit hazardous emissions or handle hazardous or acutely hazardous material, substances, or waste within one-quarter mile of an existing or proposed school?			1,2,3	7
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				A
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			1,2,3	7
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				7
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			1,2,3	7
h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?				A
HYDROLOGY AND WATER QUALITY - Would the project:				
a) Violate any water quality standards or waste discharge requirements?			1,2,3	7

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				A
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			1,2,3	7
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			1,2,3	7
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?			1,2,3	7
f) Otherwise substantially degrade water quality?			1,2,3	7
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				A
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?			1,2,3	7
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				A
j) Inundation by seiche, tsunami, or mudflow?				A
LAND USE AND PLANNING - Would the project:				
a) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			1,2,3	7

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b) Conflict with any applicable habitat conservation plan or natural community conservation plan?				A
MINERAL RESOURCES - Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				A
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				A
NOISE - Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			1,2,3	7
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			1,2,3	7
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			1,2,3	7
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			1,2,3	7
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				A
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				A
POPULATION AND HOUSING - Would the project:				

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			1,2,3	7
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				A
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				A
PUBLIC SERVICES -				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?			1,2,3	7
Police protection?			1,2,3	7
Schools?				A
Parks?				A
Other public facilities?				A
RECREATION -				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				A
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				A
TRANSPORTATION/TRAFFIC - Would the project:				

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
a) Cause an increase in traffic which his substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	1,2,3			7
b) Exceed, either individually or cumulatively, a Level-of-Service standard established by the county congestion management agency for designated roads or highways?	1,2,3			7
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				A
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incomplete uses (e.g., farm equipment)?				A
e) Result in inadequate emergency access?			1,2,3	7
f) Result in inadequate parking capacity?				A
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				A

UTILITY AND SERVICE SYSTEMS - Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				A
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				A
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				A
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				A
e) Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				A

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				A
g) Comply with federal, state, and local statutes and regulations related to solid waste?				A

MANDATORY FINDINGS OF SIGNIFICANCE -

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, or cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		1.2.3		7
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			1,2,3	7
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		1.2.3		7

Chapter 5 SUMMARY OF PUBLIC / AGENCY INVOLVEMENT PROCESS / TRIBAL COORDINATION

5.1 Introduction

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential effects and measures to minimize or avoid harm and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: project development team meetings, interagency coordination meetings, and presentations at public meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address and resolve project-related issues through early and on-going coordination.

Early Project Planning

Community outreach for the Route 101 corridor traffic and safety projects began March 2000 when Caltrans and Humboldt County Association of Governments (HCAOG) were in the process of preparing the Project Study Report. Caltrans held a public informational meeting on March 7, 2000 to discuss traffic safety and operations improvement alternatives along the Route 101 corridor, including upgrading the expressway to a freeway. Public comments on proposed alternatives were received through March 24, 2000. Approximately 150 people attended during the three-hour period. Comments received from the public included concerns about wetland impacts, growth-inducement, impacts to local streets, bicycle accommodation, and interest in assessing public rail and bus transit as a congestion solution.

Project alternatives proposed by Caltrans and HCAOG and associated documents (such as the Project Study Report, Supplemental Project Report, Value Analysis Report etc.) have undergone review by Caltrans' Project Development Team and HCAOG's Citizens Advisory Committee, which has representatives from different geographic areas as well as different transportation modal interest groups.

A multi-agency Eureka-Arcata Corridor Safety Task Force was established on September 17, 2001, with representatives from local cities and the county as well as local law enforcement agencies. The purpose of this Task Force was to make recommendations on interim safety improvements for the corridor, monitor the effectiveness of measures taken and provide input on any additional improvements that might be necessary. As part of the safety education and promotional effort, the

Task Force created the "Give a Minute, Safe a Life" campaign and developed educational materials and public service announcements to help publicize the program. The Safety Corridor measures were implemented in May 2002.

Scoping

Scoping is the process for determining the range of project related issues to be addressed in an Environmental Impact Statement (EIS) and for identifying substantial issues to be analyzed in depth in an EIS.

In compliance with NEPA, a Notice of Intention to prepare an Environmental Impact Statement was published in the Federal Register on August 31, 2001. In compliance with CEQA, the State Clearinghouse to reviewing agencies sent a Notice of Preparation for an Environmental Impact Report on September 7, 2001.

A Public Scoping Meeting was held on September 20, 2001, in Eureka to identify project related environmental issues or concerns at the beginning of the formal environmental documentation process. Caltrans staff explained the traffic safety and operations improvement alternatives/options that were under consideration, answered questions, and listened to comments. Approximately fifty people attended. Most comments were in support of the project, however comments also reflected concerns for restricting access to businesses and wetland impacts.

A separate meeting with resource agencies was held earlier on the same day. Representatives from the following agencies attended: California Coastal Commission, Humboldt Bay Harbor Recreation and Conservation District, California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corps of Engineers. Comments received were similar to those from the public meeting; however there was a greater emphasis on wetlands, endangered species, and visual effect of the proposed Indianola Cutoff interchange structure, and wetland mitigation prospects.

The main concerns associated with the alternatives under consideration included:

- The potential economic impact of median closures on the businesses and residents located along the Route 101 corridor;
- Possible loss of farmland or displacement of businesses;
- The potential impact of increased traffic on safety and quality of life in the small communities located along Old Arcata Road or the Samoa Peninsula;
- The potential for inducing "big box" or strip commercial development in the area of the proposed Indianola interchange;

- The potential impact on bicycle safety; and
- The potential impact of doing nothing, which could make entering and exiting Route 101 increasingly difficult as population growth and economic expansion continues in the future.

In early 2006, roadway rehabilitation work and new alternatives were added to the project necessitating a second NOI and NOP. The second NOI was published in the Federal Register on May 26, 2006. The second Notice of Preparation (NOP) for the Eureka-Arcata Route 101 Corridor Improvement Project was submitted on May 23, 2006, to the State Clearinghouse. In addition to the NOP submittal, a press release was sent out on May 23, 2006, notifying the public of the combined Eureka-Arcata project and preparation of the EIR. The public comment period closed June 16, 2006.

Copies of the NOIs, NOPs, public meeting notice, and written comments submitted by the public are included in this chapter.

May 2003 Open House

Caltrans held a public open house in Eureka on May 15, 2003. Project information including refined project alternatives and preliminary study findings were presented. Many area residents, as well as representatives of some of the business and property owners in the Route 101 corridor attended this meeting. Some of the business owners expressed concern about the potential closure of median openings along Route 101 and the effect this could have on their business, income and property values. Others expressed the view that the project was essential for safety. Owners of businesses that provide one-of-a-kind merchandise, have few competitors in the area, and/or have a loyal customer base expressed the view that their businesses would not be affected by any of the project alternatives. Others business owners stated that increased travel times and out-of-direction travel would drive many of their customers to competitors and possibly force them out of business.

Additionally, concerns were raised regarding increased traffic on Route 255, where traffic volumes increased by approximately 30% after the Safety Corridor was implemented. Residents along Route 255 expressed strong interest in developing a project that would reduce speeds on Route 255.

The meeting also provided an opportunity for the public to submit comments to the Project Development Team. Copies of written comments received from the public are included in this chapter.

Other Public Participation

In addition to the public participation efforts described above, Caltrans made special efforts to reach out to and involve residents of Lazy J Trailer Ranch and the Eureka KOA in the Route 101 corridor improvement project area. In Spring 2004, invitations were sent to all 54 units at Lazy J Trailer Ranch inviting residents to attend a focused meeting with Caltrans staff from 6:00 to 7:00 PM on April 15, 2004, at the City Council Chambers in Eureka City Hall.

Caltrans also sponsored two meetings on the evening of December 8, 2004, for residents along the Route 101 corridor. The first meeting was held from 5:00 PM to 6:00 PM at the Carl Johnson Store, located at 3950 Jacobs Avenue, immediately adjacent to the Lazy J Trailer Ranch. The second was held from 7:00 to 8:00 PM at the Caltrans Maintenance facility, adjacent to the Eureka KOA.

Caltrans also published two project newsletters; the most recent one was published September 2003.

The Eureka-Arcata Corridor Improvement Project was featured at the Caltrans information booth at the 2006 Humboldt County Fair in Ferndale, California from August 10-20, 2006.

Formal Project Development Team Meetings

Representatives from the following organizations as well as Caltrans representatives constitute the Project Development Team (PDT), which provided, and will continue to provide guidance to Caltrans staff preparing the preliminary engineering design and environmental documentation: U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration – Fisheries, Humboldt County Association of Government (HCAOG), U.S. Fish & Wildlife Service, California Coastal Commission, City of Arcata Public Works, Federal Highway Administration (FHWA), Eureka Police Department, Table Bluff Reservation, California Highway Patrol, the County of Humboldt Planning Department, County of Humboldt Public Works Department. The PDT met at the following dates:

8-23-01– Project kick-off meeting;

10-3-02 – Discussed draft traffic alternatives report and project designs;

7-22-04 – Discussed possible new project alternatives;

9-16-04 – Continued discussion of possible new project alternatives.

Tribal Coordination

Caltrans initiated consultation efforts with the various Native American Tribes of the area in 2002. Appendix C of the Archaeological Survey Report (ASR) completed by Morgan et al. (2006) contains copies of a majority of the Native American Correspondence for this project. The ASR also contains a written summary of verbal consultation conducted for this project. The Table Bluff Rancheria (Wiyot Tribe) was identified by all as the group to speak to regarding this project and its potential effects to culturally sensitive areas. Due to this, the Wiyot Tribe has received the focus of a majority of the consultation efforts.

At the Project Development Team (PDT) Meeting held on October 3, 2002, the Table Bluff Rancheria (Wiyot Tribe) was invited and attended. Marnie Atkins, Cultural Resource Coordinator for the Tribe noted during the meeting that the Tribe was concerned about potential impacts to culturally sensitive areas along Old Arcata Road, which will receive more traffic during the building of this project. Due to this, no changes or alterations to Old Arcata Road are being proposed as part of this project.

Caltrans requested review of Sacred Lands File and list of potential Native American individuals/organizations who might have knowledge of cultural resources in project area from the Native American Heritage Commission. Caltrans received response on October 31, 2002, which noted no known Native American cultural resources in project area. A list of Native American individuals/organizations was also received.

Information provided by Tribes and Native individuals is considered confidential and questions about this can be referred to Timothy Keefe, Caltrans Archaeologist, at 707-441-2022.

Citizen Advisory Committee

The Humboldt County Association of Governments, working in cooperation with Caltrans, formed a Citizen Advisory Committee (CAC). The CAC has, and will continue to function in an advisory capacity to the Project Development Team to express community opinions and concerns. CAC topics have included neighborhood associations, business interests, environmental groups, advocacy groups and special interests.

The first meeting was held in March 2002, and the project alternatives and environmental process were described.

A second meeting was held July 1, 2004, to discuss residential/business concerns along Jacobs Avenue.

At this time there has been no formal feedback from the CAC to the PDT, however, some concern has been expressed from CAC members through HCAOG over potential effects to businesses, customers, and residents resulting from out-of-direction travel created by access restrictions.

VA Team Meeting

Since the project exceeds $25 million, and because of the controversial nature of the project, a Value Analysis (VA) was performed for the project in 2002. The VA team was comprised of representatives from Caltrans, the California Department of Fish and Game, City of Eureka, U.S. Fish and Wildlife Service, and one private citizen from the City of Arcata. See Chapter 2 for more information about the VA process.

Project Manager's Speaking engagement on Eureka – Arcata Corridor Improvement Project

In addition to Caltrans sponsored public meetings, Kim Floyd, the Caltrans Project Manager for the Eureka-Arcata Corridor Improvement Project, attended the following meetings to make presentations and answer questions.

Board of Supervisors - public comment received - August 21, 2001
Scoping Meeting - public comment received - September 20, 2001
Arcata Kiwanis Club - October 1, 2001
Eureka Chamber of Commerce - October 11, 2001
McKinleyville Chamber of Commerce - November 5, 2001
Focus on Bayside - Bayside Grange - January 30th, 2002
Citizen Advisory Committee Kickoff - March 6, 2002
Humboldt Planning Commission Study Session - March 7, 2002
McKinleyville Kiwanis Club - April 16, 2002 (CCF)
Public Informational Meeting – public comment received - May 15, 2003
Humboldt Bay Kiwanis Club - June 12, 2003
CAP Working Group at the Farm Store - July 23, 2003
Eureka City Council - September 16, 2003, see notes
Board of Supervisor - September 23, 2003, see notes
CAC Meeting - October 1, 2003
Arcata City Council – October 2003
CAP Working Group at the Farm Store – April 25, 2006

Caltrans personnel meetings with public resource agencies:

- Met with Coastal Commission staff on April 6, 2006, and July 27, 2006.

- Met with resource agencies August 14, 2006, to discuss fish-friendly tide-gates, listed Threatened and Endangered Species.

- Provided an informational field tour of the Route 101 Eureka – Arcata Corridor and described the proposed project to California Coastal Commission staff and commissioners on September 14, 2006.

- Met with resource agencies October 24, 2006, to discuss draft conceptual wetland mitigation plan.

- Project manager met with Robert Merrill and Melanie Faust October 31, 2006 to discuss California Coastal Trail as it relates to the project as well as other project issues.

Newspaper Articles

The Route 101 Eureka-Arcata Improvement project has been the subject of numerous articles, opinion-editorials, and letters to the editors of several newspapers. The following is a sampling of article titles:

- "Slow progress on fix for deadly stretch of highway." *McKinleyville Press*. 1-30-02.

- "Making Highway 101 Safer: No Quick Fixes." 2-1-02.

- "Caltrans unveils possible plans for safety corridor." *Times-Standard*. 5-17-03

- "Safety Corridor works – but not for Manila." *The Arcata Eye*. 7-22-06

- "Caltrans moves forward with 'safety corridor.'" *The Eureka Reporter*. 5-24-06

[Insert NOPs, NOIs, public notices, written comments]

Chapter 6 MITIGATION AND MONITORING COMMITMENTS

Mitigation Measures For Significant Impacts Under CEQA

The following are proposed avoidance, minimization and/or mitigation measures included in this project for each significant impact listed above.

- Tree, shrub planting to offset tree removal – see Section 3.1.7 in Chapter 3 for more information;

- Enhance, restore, and create wetlands to offset permanent filling of wetlands – see Section 3.3.2 in Chapter 3 for more information;

- Adhere to construction work windows, abate pile-driving noise, identify and implement appropriate best management practices to avoid adversely affecting Endangered, Rare or Threatened Species– see Section 3.3.2 in Chapter 3 for more information.

Measures to Avoid or Minimize Non-significant Impacts:

- The construction contractor shall only be allowed to stage or otherwise use unpaved areas shown on plans;

- Fencing will be installed prior to construction activities to identify sensitive cultural/biological resources to avoid;

- Revegetation will be initiated within one year of slope disturbance;

- For monitoring purposes, the District Archaeologist shall receive at least two weeks notice that the work will begin;

- Through consultation between Caltrans and the Table Bluff Wiyot Tribe it has been agreed to monitor these locations in the event that items of significance to the Tribe are unearthed during earthmoving activities;

- Best Management Practices to avoid and minimize adverse water quality effects during and after construction will be implemented – see Section 3.2.2 in Chapter 3 for more information.

Other measures to avoid, minimize, and mitigate for adverse project effects could be imposed during the resource agency permitting process after the Environmental Impact Report/Statement is approved.

Chapter 7 LIST OF PREPARERS

The following Caltrans personnel prepared this document:

Todd Lark, Transportation Engineer, BS Civil Engineering, California Polytechnic University, San Luis Obispo 1989; 11 years design experience for private consulting engineering firm, six years highway design and project development experience Caltrans. Prepared Project Report.

Kimberly Floyd, Senior Transportation Engineer, BS Civil Engineering, UC Davis, 15 years engineering experience. Project Manager.

Rod J. Parsons, Senior Environmental Planner, BS Biology, Hayward State University. Fifteen years of environmental planning experience. Supervised preparation of Initial Study and coordination of environmental studies for the project.

Mitchell Higa, Associate Environmental Planner, BA Environmental Studies and Planning, Sonoma State University. Eighteen years of environmental planning experience. Prepared Environmental Impact Report/Statement and coordinated environmental studies for the project.

Gail G. Popham, Associate Environmental Planner – Natural Science, BS Fisheries Science, Oregon State University, 1996. BS Wildlife Science, Oregon State University, 1996. MS Natural Resources, Humboldt State University, 2000. Ten years of research experience with plant, fish, and wildlife ecology. Four years of experience in Environmental Planning. Prepared natural environment study.

Laura Lazzarotto, Landscape Architect license #4045. BA Landscape Architecture, University of California, Berkeley; 17 years experience in Landscape Architecture. Prepared Visual Impact Analysis report for Roadway Rehabilitation Project.

Timothy Keefe, Associate Environmental Planner – Archaeology. BA Anthropology, University of Massachusetts at Amherst, 1990; 8 years experience as an archaeologist for the State of California. 10 years previous archaeological experience includes National Park Service at Yosemite National Park and Stanislaus National Forest, fieldwork in Michoacan and Zacatecas, Mexico, archaeological field projects in New Mexico and Massachusetts. Prepared supplemental Archaeological Survey Report.

Judy Tordoff, Associate Environmental Planner - Archaeology. MA and Ph.D., Anthropology (Human Osteology and Historical Archaeology, respectively), Michigan State University. 39 years archaeological experience, 25 of them in California. Caltrans PQS - Principal Investigator, Historical Archaeology. Prepared Archaeological Survey Report.

Kimberly Wooten, Associate Environmental Planner, Archaeology. BA Anthropology, University of California, Santa Barbara, and has worked as an archaeologist since 1988 on both prehistoric and historical sites in California; prehistoric sites in British Columbia; and classical period sites in Greece. Ms. Wooten qualifies as a PQS Co-principal Investigator in historical archaeology. Co-authored the supplemental HRER.

Janice Calpo, Caltrans Headquarters Staff Architectural Historian, MS Historic Preservation, University of Oregon, Eugene. Eleven years experience in the field of Cultural Resources Management, including cultural resource surveys for Section 106 and CEQA compliance. Assisted in both the archival research and field inventory for the project.

Ted Schultz, P.E., Transportation Engineer. BS Civil Engineering; 30 years of transportation and facility engineering experience. Prepared Water Quality Study Supplemental Report.

Kelley Garrett, Associate Environmental Planner, BS Natural Resources Planning, Humboldt State University, Arcata; seven years experience as a project biologist. Prepared Conceptual Mitigation Plan.

Sharon Tang, Transportation Engineer Technician (Air/Noise); AA Business/Engineering, Sacramento City College; five years experience. Prepared Air Quality Analysis.

Benjamin Tam, Transportation Engineer, BS Civil Engineering, San Jose State University, San Jose, CA; 16 years Caltrans experience, 9 years as noise specialist. Oversight of noise and energy studies.

Steve Werner, Associate Engineering Geologist. MS Geology, San Diego State University. Registered geologist with fifteen years experience in Hazardous Waste Management. Prepared Hazardous Waste Study.

Other Caltrans project development personnel who contributed to the EIR/S preparation:

Lena Ashley, Senior Transportation Engineer
Deborah Harmon, Senior Environmental Planner
Barry Douglas, Associate Environmental Planner – Archaeology
Dave McCanless, Senior Right-of-Way Agent
John Carson, Senior Transportation Engineer
Rick Mayberry, Transportation Engineer
Illene Poindexter, Senior Transportation Engineer
Audrey Oakley, Associate Right-of-Way Agent - Utilities
Larry Bowermaster, Senior Transportation Engineer, Construction

David Melendrez, Senior Transportation Engineer, Water Quality
Jim Hibbert, Landscape Architect
Mark Sobota, Transportation Engineer
Charlie Hayler, Transportation Engineer

The following consultants prepared specialized studies for this environmental document:

URS Corporation

Armando Cuellar. MA Anthropology, Hayward State University; five years experience in cultural resources management. Prepared Cultural Resources reports.

Sean Dexter. BA Anthropology, University of Nevada, Reno; nine years experience in cultural resources management. Prepared Cultural Resources reports.

Suzanne Eastridge. BS Environmental Sciences, University of California, Santa Cruz; 5 years experience as an environmental planner. Assistant Project Manager for Environmental Studies.

David Fee. MA Anthropology, University of Arizona; 21 years of technical and project management experience. Project Manager for Environmental Studies.

Brian Graham. BA Geology, University of Colorado; 5 years of project experience related to hazardous materials. Prepared Phase 1 Environmental Site Assessment report.

Rosemary Laird. MS Marine Science, College of William and Mary; six years experience in preparing biological resources studies. Prepared Natural Environment Study report.

Stephen Leach. MA Plant Ecology, University of California, Davis; ten years experience preparing biological resources studies. Prepared Natural Environment Study report.

Corrina Lu. MA Geography, University of California, Los Angeles; five years experience in preparing biological resources studies. Prepared Natural Environment Study report.

Joe Morgan. BS Chemistry, Georgia Institute of Technology; 18 years of project experience related to hazardous materials. Prepared Phase 1 Environmental Site Assessment report.

Sally Morgan. MA Anthropology, San Francisco State University; 22 years experience in cultural resources management. Prepared Cultural Resources reports.

Geoff Thornton. BS Biochemistry, University of California, San Diego; three years experience as an environmental scientist and environmental planner. Prepared Air Quality and Energy reports.

Cheri Velzy. BS Meteorology, California State University, San Jose; 8 years experience as an air quality specialist. Prepared Air Quality report.

Jeff Zimmerman. BS Conservation of Natural Resources, University of California, Berkeley; 20 years experience in environmental planning and project management. Peer Reviewer.

Illingworth & Rodkin, Incorporated

Richard Illingworth. BS Civil Engineering, University of California, Davis; 34 years experience as a noise specialist. Prepared Noise Impact Study report.

James Reyff. BS Geosciences, San Francisco State University; 12 years experience as a noise specialist. Prepared Noise Impact Study report.

Michael Thill. BS Environmental Studies, University of California, Santa Barbara; 4 years experience as a noise specialist. Prepared Noise Impact Study report.

JRP Historical Consulting Services

Brian Hatoff. Registered Professional Archaeologist; BA, MA Anthropology, University of California, Davis; 31 years experience in cultural resources management. Prepared Cultural Resources reports.

Amanda Blosser. MS History, Texas Tech University; 3 years experience as an architectural historian. Prepared Historical Resources Evaluation Report.

Courtney Chambers. MA Candidate Public History, California State University, Sacramento; 2 years experience as an architectural historian. Prepared Historical Resources Evaluation Report.

Rand Herbert. MAT History, University of California, Davis; 27 years of experience as an architectural historian. Prepared Historical Resources Evaluation Report.

Mara Feeney & Associates

Mara Feeney. MA Community and Regional Planning, University of British Columbia; 23 years experience as a community and regional planner. Prepared Community Impact Assessment.

William Paul. PhD Environmental Planning and Design, Virginia Tech. 7 years experience as a land use planner and community involvement specialist. Prepared Community Impact Assessment.

Vallier Design Associates

Matt Brockway. Bachelor of Science / Landscape Architecture, 1986, Colorado State University, Fort Collins, CO; 17 years of professional experience in the production of visual simulations and visual impact assessments. Prepared Visual Impact Assessment.

WRECO

John Mountain. MS Civil Engineering, California State University, Long Beach; 22 years experience as a civil engineer specializing in water resources and transportation projects. Prepared Water Quality Study Report.

Chapter 8 DISTRIBUTION LIST

In compliance with NEPA and CEQA, public agencies have been notified of the availability of the Draft EIR/S. The Draft EIR/S availability has been published in the Federal Register and in local newspapers. The notifications of availability have been sent to all parties on the project mailing list.

The Draft EIR/S has been distributed to key interested parties and key elected and appointed officials. The Draft EIR/S is available at the following locations:

Arcata Public Library, 500 7th Street, Arcata

Eureka Public Library, 1313 3rd Street, Eureka

Caltrans District 1 Office, 1656 Union Street, Eureka
Please call Mitchell Higa at (707) 441-5855 in advance.

The Draft EIR/S was sent to the following organizations:

Resources Agency
1416 Ninth St. Ste. 1311
Sacramento, CA 95814

Dept. of Conservation
801 K Street, 24th Floor
Sacramento, CA 95814

Department of Fish and Game
60l Locust Street
Redding, CA 96001

California Coastal Commission
Eureka Office
P.O. Box 4908
Eureka, CA 95502-4908

Regional Water
Quality Control Board
North Coast Region
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

State Office of
Historic Preservation
P. O. Box 942896
Sacramento, CA 94296 – 0001

Native American
Heritage Commission
9l5 Capitol Mall, Room 364
Sacramento, CA 95814

California State Lands Commission
100 Howe Ave Suite 100 South
Sacramento, CA 95825-8202

California Highway Patrol
Office of Special Projects
2555 1st Ave.
Sacramento, CA 94298

California Highway Patrol
255 East Samoa Blvd.
Arcata 95521-6797

Air Resources Board
1001 I St
Sacramento, CA 95814-2814

Integrated Waste
Management Board
1001 I St
Sacramento, CA 95814

Dept. of Toxic
Substances Control
CEQA Tracking Center
400 P Street, Fourth Floor
P.O. Box 806 (1001 "I" St)
Sacramento, CA 95812-0806

North Coast
Unified Air Quality
Management District
2300 Myrtle Avenue
Eureka, CA 95501

Natural Resources
Conservation Service
5630 S. Broadway
Eureka, CA 95503

Humboldt County
Planning Department
3033 H Street
Eureka, CA 95501

Hank Seemann
Environmental Services
Humboldt County
Public Works Department
1106 Second Street
Eureka, CA 95501

City of Eureka
Public Works and Building Dept.
531 K Street
Eureka, CA 95501

City of Arcata
736 F Street
Arcata, CA 95521

Humboldt Bay Harbor,
Recreation and
Conservation District
601 Startare Drive
Eureka, CA 95501

Federal Agencies

U.S. Fish and Wildlife Service
1655 Heindon Rd.
Arcata, CA 95521

National Marine Fisheries Service
1655 Heindon Road
Arcata, CA 95521-4573

U.S. Army Corps of Engineers
Eureka Field Office
P. O. Box 4863
Eureka, CA 95502

U.S. Environmental
Protection Agency
75 Hawthorne Street
San Francisco, CA 94105-3901

U.S. Coast Guard
Eleventh Coast Guard District
Building #50-6, Coast
Guard Island
Alameda, CA 94501

Interested parties

Table Bluff Reservation
of Wiyot Indians
P. O. Box 519
Loleta, CA 95551

Blue Lake Rancheria
P. O. Box 428
Blue Lake, CA 95525

Bear River Band of
Rohnerville Rancheria
P. O. Box 731
Loleta, CA 95551

101 Corridor Access Project Group
c/o Harper Ford Country
4800 Highway 101 North
Eureka, CA 95501
Attn.: Trevor Harper

Humboldt Transit Authority
133 V Street
Eureka, CA 95501

Eureka Heritage Society
P. O. Box 1354
Eureka, CA 95502

Humboldt County
Historical Society
703 Eighth Street
Eureka, CA 95501

Sierra Club
Redwood Chapter Sierra Club
P. O. Box 238
Arcata, CA 95521

Northcoast Environmental Center
575 H Street
Arcata, CA 95521

California Native Plant Society
P. O. Box 1067
Arcata, CA 95518

Audubon Society
Redwood Region
P. O. Box 1054
Eureka, CA 95502

Eureka Chamber of Commerce
2112 South Broadway
Eureka, CA 95501

Redwood Community
Action Agency
Natural Resources Services

904 G Street
Eureka, CA 95501

Keep Eureka
Beautiful Committee
2020 Fern Street
Eureka, CA 95503

Friends of Humboldt County
P.O. Box 738
Eureka, CA 95502-0738

Humboldt Bay Bicycle
Commuters Association

Chapter 9 References

This chapter consists first of references to prepare the overall document followed by references used to prepare individual specialized studies that are summarized in this document.

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Appendix A – Project Plan Sheets and Typicals

List of Appendix A Displays

Display Number or Name	Display Description
X-1	Typical roadway cross section at three Route 101 locations showing the existing and proposed roadway elements
X-2	Typical cross sections of the proposed Route 101/Indianola Cutoff interchange
X-3	Typical cross sections of staged bridge construction; traffic staging during construction is also shown for the two Jacoby Creek Bridges
X-4	Typical cross sections of Route 101 showing proposed median barrier
X-5	Typical cross sections of proposed work at Route 101/255 interchange ramps in Arcata
Index of Plan Sheets	This map shows the location of plan sheets that follow in relation to the project limits
Plan Sheets 1-29	To show the proposed project in sufficient detail, the proposed project was divided into 29 separate project plan sheets to show the proposed project elements for the three Build Alternatives. The existing highway elements are shown in a lighter color to contrast from the proposed project elements. The plan sheets also indicate the proposed easement acquisition.
Wetland Plan Sheets 1-29	This set of plan sheets depict the temporary and permanent wetland impact as well as Waters of the U.S. that would result from building any of the three build project alternatives

Appendix B – Level of Service

Appendix C – Title VI Statement

Appendix D – Resources Evaluated Relative to the Requirements of Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 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 recreation lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) specifies that the Secretary [of Transportation] may approve a transportation program or project . . . 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.

In this Draft Environmental Impact Report/Statement, all archaeological and historic sites within the Section 106 area of potential effects (APE) and all public and private parks, recreational facilities, and wildlife refuges within approximately one-half mile of any of the project alternatives were analyzed to determine whether they are protected Section 4(f) resources.

This section discusses parks, recreational facilities, wildlife refuges and historic properties found within or adjacent to the project area that do not trigger Section 4(f) protection either because: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, 4) the project does not permanently use the property and does not hinder the preservation of the property, or 5) the proximity impacts do not result in constructive use.

Four designated wildlife areas and refuges located adjacent to, or within the BSA (see Plan Sheets in Appendix A):

- Humboldt Bay National Wildlife Refuge is managed by U.S. Fish and Wildlife Service and is located along the Humboldt Bay shoreline west of Route 101 between Eureka and Arcata;

- Fay Slough Wildlife Area is managed by the California Department of Fish and Game (CDFG) and is located between Indianola Cutoff and Airport Road east of Route 101;

- Eureka Slough Wildlife Area is also managed by CDFG and is located at the western end of Jacobs Drive on the eastern side of Route 101.
- Bracut Marsh was established by the Redwood Community Action Agency. This marsh is located west of Route 101 and north of the Bracut businesses.

These wildlife areas provide wetland habitat, including diked marshes, seasonal wetlands, salt marshes, mudflats and open water, to thousands of migratory birds along the Pacific flyway. The proposed project would avoid direct, indirect, and cumulative impacts to all Wildlife Areas and Refuges.

Public access for hunting is permitted from approximately October through January at the Humboldt Bay National Wildlife Refuge near the Route 101 southbound Jacoby Creek Bridge. Although designated public parking is not available, hunters often park vehicles near the bridge during hunting season. Replacement of this bridge is included in all Build Alternatives. Bridge construction activities are not expected to substantially affect hunting, wildlife, or parking for hunting. Therefore, the provisions of Section 4(f) are not triggered of the Humboldt Bay National Wildlife Refuge resource.

Route 101 is an undesignated bikeway; primarily not a recreational bicycle facility; this project will not affect the possible future construction of the California Coastal Trail. Therefore, the provisions of Section 4(f) are not triggered.

Section 4(f) *De Minimis* Use

Under 49 USC 303(d)[+], FHWA may determine, if certain conditions are met, that a project will have only a *de minimis* impact on a property protected by Section 4(f) of the U.S. Department of Transportation Act of 1966. With respect to historic sites, FHWA may make such a finding only if it is determines that the project will have no adverse effect on the site (or that there will be no historic properties affected by the project) and the SHPO concurs in the no adverse effect finding. If this is the case, the requirements of Section 4(f) are considered satisfied (49 USC 303(d)(1)(A)).

Alternative 3 would require right-of-way acquisition from the Murray Field Airport west of Route 101 near Airport Road, which does not include the NRHP eligible portion of the airport. As mentioned above, on November 29, 2006, the SHPO concurred in FHWA's finding of no adverse effect to the airport property. Accordingly, FHWA has preliminarily determined that if Alternative 3 were selected it would result in a *de minimis* impact to the Murray Field Airport property for purposes of Section 4(f).

[+] Title 23, USC, § 138(b) contains an identical provision, applicable only to the Federal Highway Administration. Section 303 of title 49, USC, applies to all USDOT programs and projects.

Appendix E – NEPA/404 Integration Process

In May 1992, the Federal Highway Administration (FHWA), the U.S. Army Corps of Engineers (USACE), and the U.S. Environmental Protection Agency (EPA) adopted an agency policy to improve interagency coordination and to integrate National Environmental Policy Act (NEPA) and Clean Water Act Section 404 procedures. A Memorandum of Understanding (MOU) was developed for Arizona, California, and Nevada that specifies how these states will implement the agency policy. The Western States MOU applies to all projects needing both Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) action under NEPA and a U.S. Army Corps of Engineers (USACE) individual permit under Section 404 of the Clean Water Act. An updated MOU applicable only to California was approved in April 2006.

Under the MOU process, U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration - Fisheries (NOAAF), Federal transit Administration (FTA), USACE and EPA are asked to concur on the project Need and Purpose statement and criteria for selecting and evaluating alternatives. USACE also verifies the delineation of jurisdictional wetlands. The MOU process also incorporates analysis of the project pursuant to 404(b)(1) of the Clean Water Act. Prior to release of the Final Environmental Impact Report/Statement (FEIR/S), USACE, EPA and USFWS are asked to provide preliminary agreement on conceptual mitigation for unavoidable impacts to special aquatic sites. USACE and EPA are also asked to provide preliminary agreement on the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to the Clean Water Act.

The goal of the MOU is to have regulatory agencies participate in the project early in its planning and to have decisions made once for each stage of the process in order to expedite matters. Regulatory agencies are to provide comments in a timely manner and are to provide written concurrence that information to date is adequate for a particular stage and that the project may proceed to the next stage. Agencies do not revisit previous concurrences unless there is significant new information or a significant change to the project, the environment, or laws and regulations. Agencies agree to attempt to resolve issues causing non-concurrence and to try to do so informally before entering formal dispute resolution.

Preliminary studies indicated the Eureka-Arcata Corridor Improvement Project would require permanently filling several acres of USACE jurisdictional wetland. Consequently consultation was initiated for the Eureka-Arcata corridor Improvement project with the USACE, EPA, USFWS, and NOAAF in accordance with the California NEPA-404 MOU. A project overview and a preliminary project Need and Purpose Statement were presented to the federal agencies at the January 15, 2002 NEPA/404 Kick-off Meeting. Comments on the Need and Purpose Statement were received, and the statement was revised accordingly. A second Integration meeting was held on March 16, 2006. At this meeting, a revised Need and Purpose Statement, Selection Criteria, and revised Range of

Alternatives were presented and discussed a to gain a greater understanding of the agencies' comments. One or more futures meetings will be required, to continue the NEPA/404 Integration MOU process by discussing the conceptual wetland mitigation plan and selecting the LEDPA.

After the revisions were made, letters of concurrence were received from the federal agencies. The agencies also provided written concurrence (letters follow) with the criteria for alternative selection and the range of alternatives being included in the Final Environmental Impact Report/Statement for this project.

Subsequent actions under the NEPA/404 Integration MOU will be to concur on the conceptual wetland mitigation plan; select the LEDPA; the publication of this Final EIR/S by Caltrans and FHWA and notification; and issuance of the Section 404 Individual Permit by the USACE.

Table E
List of NEPA/404 Correspondence Letters

Date	From	To	Subject
6-10-02	Caltrans	NEPA/404 Participants	Request concurrence on Need and Purpose Statement; range of alternatives; selection criteria
7-8-02	U.S. EPA	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
7-29-02	U.S. Fish and Wildlife Service	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
5-9-02	National Marine Fisheries Service	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
9-16-02	U.S. Army Corps of Engineers	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
4-11-06	Caltrans	NEPA/404 Participants	Request concurrence on revised Need and Purpose; Range of alternatives; Selection criteria
6-12-06	National Marine Fisheries Service	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
6-19-06	U.S. Environmental Protection Agency	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
8-11-06	U.S. Fish and Wildlife Service	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
6-12-06	U.S. Army Corps of Engineers	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria

Appendix F – Traffic Noise Fundamentals

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. There are several noise measurement scales, which are used to describe noise. The *decibel (dB)* is a unit of measurement, which indicates the relative amplitude of a sound. Zero on the decibel scale is based on the lowest sound level that a healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a wide range of intensities. Since decibels are logarithmic units, sound pressure levels are not added arithmetically. Two sounds of equal sound pressure level are added; the result is a sound pressure level that is three dB higher. For example, if the sound pressure level were 70 dB when 100 cars pass an observer, then it would be 73 dB when 200 cars pass the same observer. Doubling the amount of energy would result in a 3 dB increase to the sound pressure level.

Frequency relates to the number of pressure oscillations per second, or Hertz (Hz). The range of sound frequencies that can be heard by healthy human ears ranges from about 20 Hz at the low frequency end to 20,000 Hz (20kHz) at the high frequency end.

There are several methods of characterizing sound. The most common is the *A-weighted sound level or dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Studies have shown that the A-weighted Leq is closely correlated with annoyance to traffic noise. Table 2 shows typical A-weighted noise levels that occur in human environments.

Noise Descriptors. Because sound levels can vary over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. A common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration. The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus one dBA.

Human Response to Noise. Studies have shown that under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of one dBA. In the normal environment, the healthy human ear can detect changes of about two dBA; however, it is widely accepted that changes of three dBA in the normal environment are considered barely detectable to most people. A change of five dBA is readily perceptible and a change of ten dBA is perceived as being twice as loud.

Sound Propagation. When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise is reduced with distance depends on the following important factors:

Geometric spreading. Sound from a single source (i.e., a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of six dBA for each doubling of distance. Highway noise is not a single, stationary point source of sound. The movement of the vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a "line" source) rather than from a point. This results in cylindrical spreading rather than the spherical spreading resulting from a point source. The change in sound level from a line source is three dBA per doubling of distance.

Ground absorption. Most often, the noise path between the highway and the observer is very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.

Atmospheric effects. Research by Caltrans and others have shown that atmospheric conditions can have a substantial effect on noise levels, especially locations beyond 60-meters (200-feet) of a highway. Wind has been shown to be the single most important meteorological factor within approximately 150-meters (500-feet), whereas vertical air temperature gradients are more important over longer distances. Other factors, such as air temperature, humidity, and turbulence, also have significant effects. Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels.

Shielding by natural or human-made features. A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by this shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver to specifically reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least five dB of noise reduction. A higher barrier may provide as much as twenty dB of noise reduction.

Appendix G – Plant Species Observed

Based upon the existing records search, site reconnaissance, and surveys of a list of special status plant species with the potential to occur in the BSA, the following list was prepared:

Table G Plant Species Observed in the Biological Study Area (BSA)		
Scientific Name	**Common Name**	**Native or Non-native**
Achillea millefolium	yarrow	native
Agrostis stolonifera	creeping bent grass	non-native
Aira caryophyllea	silver hair grass	non-native
Alisma plantago-aquatica	water plantain	native
Alnus rubra	red alder	native
Alopecurus geniculatus	water foxtail	native
Anagallis arvensis	scarlet pimpernel	non-native
Anaphalis margaritacea	pearly everlasting	native
Anthoxanthum odoratum	sweet vernal grass	non-native
Aster chilensis	California aster	native
Avena barbata	slender wild oat	non-native
Avena fatua	wild oat	non-native
Baccharis pilularis	coyote brush	native
Boronia sp.	Boronia	non-native
Brassica rapa	field mustard	non-native
Briza maxima	rattlesnake grass	non-native
Briza minor	little rattlesnake grass	non-native
Bromus carinatus var. carinatus	California brome	native
Bromus diandrus	ripgut brome	non-native
Bromus hordeaceus	soft chess	non-native
Carduus pycnocephalus	Italian thistle	non-native
Carex section Ovalesa	Sedge	native
Carex obnupta	slough sedge	native
Carex praegracilis	clustered field sedge	native
Castilleja ambigua ssp. humboldtiensis	Humboldt Bay owl's-clover	native
Cirsium vulgare	bull thistle	non-native
Cistus sp.	Rockrose	non-native
Conium maculatum	poison hemlock	non-native
Cordylanthus maritimus ssp. palustris	Point Reyes bird’s-beak	native
Cortaderia jubata	pampas grass	non-native
Cotula coronopifolia	brass buttons	non-native
Cerastium fontanum ssp. vulgare	mouse ear chickweed	non-native

Cupressus macrocarpa	Monterey cypress	native
Cynosurus echinatus	hedgehog dog tail grass	non-native
Cynodon dactylon	Bermuda grass	non-native
Cyperus eragrostis	nut sedge	native
Dactylis glomerata	orchard grass	non-native
Daucus carota	Queen Anne's lace	non-native
Deschampsia cespitosa ssp. holci-formis	California hair grass	native
Digitalis purpurea	Foxglove	non-native
Dipsacus folllonum	wild teasel	non-native
Distichlis spicata	Saltgrass	native
Eleocharis macrostachya	Spike rush	native
Epilobium ciliatum	Willow herb	native
Equisetum telmateia ssp. braunii	giant horsetail	native
Erechtites glomerata	New Zealand fireweed	non-native
Escallonia sp.	Escallonia	non-native
Eucalyptus globulus	blue gum eucalyptus	non-native
Euphorbia peplus	petty spurge	non-native
Epilobium ciliatum	Willow herb	native
Festuca arundinacea	tall fescue	non-native
Foeniculum vulgare	Fennel	non-native
Galium sp.	Bedstraw	native or non-native
Genista monspessulana	French broom	non-native
Geranium bicknelli	Bicknell's geranium	native
Geranium dissectum	cut leaf geranium	non-native
Grindelia stricta var. stricta	coastal gum plant	native
Heracleum lanatum	cow parsnip	native
Hirschfeldia incana	short-pod mustard	non-native
Holcus lanatus	velvet grass	non-native
Hordeum murinum ssp. leporinum	foxtail barley	non-native
Hydrocotyle sp.	marsh-pennywort	native
Hypochaeris radicata	rough cat's ear	non-native
Iris douglasiana	Douglas' iris	native
Juncus articulatus	jointed rush	native
Juncus bufonius var. bufonius	toad rush	native
Juncus effusus s.l.	bog rush	native
Juncus lesueurii	salt rush	native
Juncus occidentalis	western rush	native
Juncus phaeocephalus var. phaeo-cephalus	brown-headed rush	native
Juncus xiphioides	iris-leaved rush	native
Lathyrus latifolius	perennial sweet pea	non-native
Leucanthemum vulgare	ox-eye daisy	non-native
Limonium californicum	marsh rosemary	native
Linum bienne	narrow leaf flax	non-native
Lolium multiflorum	Italian ryegrass	non-native

Lolium perenne	perennial ryegrass	non-native
Lonicera involucrata var. ledebourii	twinberry	native
Lotus corniculatus	bird's foot trefoil	non-native
Lupine sp.	lupine	native or non-native
Luzula comosa	Pacific woodrush	native
Lythrum hyssopifolium	hyssop loosestrife	non-native
Madia sativa	coast tarweed	native
Medicago polymorpha	California bur clover	non-native
Melilotus indica	sour clover	non-native
Mentha pulegium	pennyroyal	non-native
Modiola caroliniana	Carolina bristle mallow	non-native
Myosotis discolor	changing forget-me-not	non-native
Myrica californica	wax murtle	native
Nerium oleander	oleander	non-native
Oenanthe sarmentosa	water parsley	native
Parentucellia viscose	yellow parentucellia	non-native
Paspalum dilatatum	dallis grass	non-native
Picris echioides	bristly ox-tongue	non-native
Pinus contorta ssp. contorta	shore pine	native
Pinus muricata	Bishop pine	native
Pittosporum sp.	pittosporum	non-native
Plantago lanceolata	narrow leaf plantain	non-native
Pleuropogon californicus	semaphore grass	native
Poa pratensis ssp. pratensis	Kentucky blue grass	non-native
Polygonum arenastrum	common knotweed	non-native
Polypogon monspeliensis	rabbitfoot grass	non-native
Polystichum munitum	western sword fern	native
Potentilla anserina ssp. pacifica	silverweed	native
Prunella vulgaris var. lanceolata	self-heal	native
Pteridium aquilinum var. pubescens	bracken fern	native
Ranunculus repens	creeping buttercup	non-native
Raphanus sativus	wild radish	non-native
Rhododendron sp.	rhododendron	non-native
Ribes sp.	currant or gooseberry	native
Rosa sp.	rose	non-native
Rubus discolor	Himalayan blackberry	non-native
Rubus ursinus	California blackberry	native
Rumex acetosella	common sheep sorrel	non-native
Rumex crispus	curly dock	non-native
Salicornia virginica	Pickle weed	native
Salix scouleriana	Scouler's willow	native
Sambucus racemosa var. racemosa	red elderberry	native
Sanguisorba minor ssp. muricata	garden burnet	non-native
Scirpus cernuus	low clubrush	native
Scirpus maritimus	prairie bulrush	native
Scirpus microcarpus	panicled bulrush	native

Scrophularia californica ssp. californica	California bee plant	native
Sequoia sempervirens	redwood	native
Silene gallica	windmill pink	non-native
Silybum marianum	milk thistle	non-native
Sonchus oleraceus	common sow thistle	non-native
Spartina densiflora	Chilean cord grass	non-native
Spergularia macrotheca	sand-spurrey	native
Stachys ajugoides var. ajugoides	Ajuga hedge nettle	native
Stachys ajugoides var. rigida	rigid hedge nettle	native
Triglochin maritima	seaside arrow-grass	native
Trifolium dubium	little hop clover	non-native
Trifolium variegatum	variegated clover	native
Trifolium repens	white clover	non-native
Trifolium hirtum	rose clover	non-native
Trifolium incarnatum	crimson clover	non-native
Typha latifolia	broad-leaved cattail	native
Veronica anagallis-aquatica	water speedwell	non-native
Vicia hirsuta	hairy vetch	non-native
Vicia sativa ssp. nigra	spring vetch	non-native
Vinca major	greater periwinkle	non-native
Vulpia bromoides	six-weeks fescue	non-native
Xanthium strumarium	rough cocklebur	native

aFlora of North America Editorial Committee, ed. 2000. Flora of North America North of Mexico. Volume 23: Magnoliophyta: Commelinidae (in part): Cyperaceae.

Appendix H – Threatened and Endangered Species Lists

Appendix H includes a letter from the U.S. Fish and Wildlife Service with a Species List for the proposed project. Since this letter was issued in 2002, an updated Species List was obtained on March 15, 2007 from the U.S. Fish and Wildlife Service website and is included in Appendix H.