Chapter 4 California Environmental Quality Act Evaluation

The proposed MSN 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.

The proposed project refers to improvements to the MSN corridor. Caltrans is considering two Build Alternatives (the Fixed HOV Lane and the Reversible HOV Lane), as described in Chapter 2, Project Alternatives. In addition, four access options are being considered in the Central Segment to provide replace access to US 101 and local circulation should the expressway be upgraded to a freeway under either of the Build Alternatives. Any of the Access Options could be combined with either Build Alternative, but only one will be identified as part of the preferred alternative prior to the final environmental document.

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, would 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, it is the magnitude of the impact that 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 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. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. Therefore, this chapter discusses the effects of this project and CEQA significance.

4.1 Determining Significance under CEQA

The CEQA Guidelines Section 16064 (b) broadly defines a significant effect on the environment as a substantial or potentially substantial adverse change in the physical environment. One of the basic purposes of the CEQA is to inform state, regional, and local governmental decisionmakers and the public of impacts of proposed activities, and in particular, those impacts that are either significant or potentially significant.

Determining and documenting whether an activity may have a significant effect on the environment plays a critical role in the CEQA process. CEQA requires specific significant impacts to be determined in an EIR. Determination of significance under CEQA guidelines begins by eliminating impacts that are obviously insignificant. Those impacts whose significance is uncertain or potentially significant undergo studies. The studies determine if the impacts result in substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change may be considered in determining whether the physical change is significant. CEQA requires substantial evidence—"facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts"—in determining significance. Serious public controversy over the environmental effects of a project shall, however, be treated as an indicator of significance. Additionally, CEQA distinguishes four mandatory findings of significance:

- Potential to substantially degrade the environment, reduce the habitat of a fish and wildlife species, cause fish or wildlife populations to drop below self-sustaining levels, threaten or eliminate a plant or animal community, reduce the number or range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory;

- Potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals;
- Environmental effects that are individually limited but cumulatively considerable; and
- Environmental effects will cause substantial adverse effects on human beings, either directly or indirectly.

4.2 CEQA Environmental Checklist

The CEQA Environmental Significance Checklist (Appendix K in this FEIR/S) identifies direct and indirect physical, biological, social factors that might be affected by the Fixed HOV Lane Alternative and the Reversible HOV Lane Alternative. This checklist is not a National Environmental Policy Act (NEPA) requirement. The findings for the CEQA checklist were determined in consultation with the technical studies prepared for the MSN Project listed in Chapter 9.

CEQA impact levels include potentially significant impact, less than significant impact with mitigation, less than significant impact, and no impact. Table 4-1 provides a reference for project impacts under CEQA. As noted in the table, impact determinations may vary by project segment. In some cases a "no impact" determination has been made based upon the project's technical and background studies, and are not presented in this chapter. Please refer to Appendix K for the complete MSN Project CEQA Checklist.

Table 4-1 Summary of Impact Determinations under CEQA

Section No.	Topic Areas	Impact Determination
4.3.1 4.3.2	Aesthetics	Segment A: Significant Unavoidable Segment B: Significant Segment C: Cumulatively Significant
4.3.3	Agricultural Resources	All Segments: Less than Significant
4.3.3	Air Quality	All Segments: Less than Significant
4.3.3	Biological Resources	All Segments: Less than Significant
4.3.3	Hazards and Hazardous Materials	All Segments: Less than Significant
4.3.3	Hydrology and Water Quality	All Segments: Less than Significant
4.3.3	Cultural Resources	Segment B: Less than Significant
4.3.3	Mineral Resources	Segment B: Less than Significant
4.3.3	Noise	All Segments: Less than Significant

Table 4-1 Summary of Impact Determinations under CEQA

Section No.	Topic Areas	Impact Determination
4.3.3	Paleontology	Segment C: Less than Significant
4.3.3	Population and Housing	All Segments: Less than Significant
4.3.3	Recreation	Segment B: Less than Significant
4.3.3	Transportation and Traffic	All Segments: Less than Significant
4.3.5	Growth Inducing	All Segments: Less than Significant

4.3 Discussion of Significant Impacts Under CEQA

4.3.1 Significant Unavoidable Impacts of the Proposed Project

This section pertains to potential environmental effects of the Fixed HOV Lane and Reversible HOV Lane Alternatives that would remain significant even after mitigation measures are taken.

4.3.1.1 Aesthetics

Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

The construction of roadway improvements and soundwalls within Segment A (the Northern Segment) could result in the removal of several hundred mature Redwood and Eucalyptus trees, which would substantially degrade the visual quality within the Northern Segment's Landscape Unit. These impacts could be partially mitigated, but would remain **significant** in the long term. Please refer to Section 3.1.11 for more information on this topic.

4.3.2 Significant Environmental Effects of the Proposed Project

4.3.2.1 Aesthetics

Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

Various project features under either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative, including the construction of interchanges, access roads, and soundwalls, would result in degradation of the visual character and quality of the highway corridor. Tree removal in the highway foreground, major landform alterations due to grading and roadway re-alignments, increased

roadway visual dominance, and other effects would result in a decline in the overall visual quality. However, with recommended mitigation measures, these adverse impacts would be substantially mitigated to **less than significant** levels in the long term within the Southern and Central Segments (Segments A and B) of the proposed project.

In the short term, **significant** temporary impacts would exist in the Central Segment until vegetation and tree replantings reach maturity (10-20 years). Please refer to Sections 3.1.11 and 3.3.2 for more information on this topic. For more detailed information on tree loss in the Northern Segment (Segment C), please refer to Section 3.3.2.

4.3.3 Less than Significant Effects of the Proposed Project

Following is a summary of the project impacts that are less than significant under CEQA:

4.3.3.1 Aesthetics

Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

The Build Alternatives would require concrete median barriers and may involve the construction of soundwalls, which would be treated to reduce potential glare. With recommended mitigation this impact would be **less than significant**.

Nighttime construction activities could have the potential to cause substantial light and glare impacts on motorists, adjacent residences, and other sensitive receptors. With recommended mitigation measures however, these impacts would be **less than significant.**

Temporary light and glare impacts from auto headlights could occur to residents adjoining the highway in the Northern Segment after removal of existing tree screening. With recommended mitigation measures, however, these impacts would be **less than significant**. Please refer to Section 3.1.11 for more information on this topic.

4.3.3.2 Agriculture Resources

Would the project convert prime farmland, unique farmland, or Farmland of Statewide Importance as show on maps prepared pursuant to the Farmland

Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Under the Fixed HOV Lane Alternative and the Reversible HOV Lane Alternative, conversion of farmland to transportation use would occur, primarily in the Central Segment. The conversion of farmland to transportation would vary depending on the Access Option. The impact of Access Option 14d would be the greatest with the conversion of 73.52 ha (181.67 ac), while Access Option 12b would have the least impact with the conversion of 63.22 ha (156.23 ac).Under the Access Options, between 0.61-0.77 ha (1.5-1.9 ac) of prime and unique farmlands would be impacted under either Build Alternative. In addition, 0.73 to 0.93 ha (1.8 to 2.3 ac) of statewide or locally important farmland would be converted under either of the Build Alternative, depending upon the Access Option identified. Minor conversion would also occur in the Northern Segment. See Section 3.1.5 for more discussion on this topic.

Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Potential conversion of Williamson Act parcels would be due to the proposed Access Options. This potential conversion is shown in Table 3.1-4, which shows that, in Marin County, potential conversions range from 5.46 to 13.5 ha (13.5 to 33.36 ha) and, in Sonoma County, from 2.68 to 3.07 ha (6.62 to 7.59 ac). The conversion of Williamson Act parcels to transportation would vary depending on the Access Option. The impact of Access Option 14d would be the greatest with conversion of 16.18 ha (39.98 ac), while Access Option 12b would have the least impact with the conversion of 8.53 ha (21.09 ac) for both counties combined. Throughout the design phase, Caltrans would continue reducing right of way impacts, where feasible.

The proposed farmland conversions would not bisect any parcels or sever existing owners from accessing their properties. Project-related construction would not interfere with the operations or functions of agricultural land uses.

For conversions that cannot be avoided, Caltrans' compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act would reduce impacts to farmlands to a less-than significant level.

Would the project involve other changes in the existing environment which, due to their location, could result in conversion of farmland, to non-agricultural use?

Under the Access Options proposed in the Central Segment, farmland would be converted to transportation and transferred to county jurisdiction. Conversion of adjacent farmland would depend upon County plans which presently support the retention of farmland (see Section 3.1.5).

4.3.3.3 Air Quality

Would the project expose sensitive receptors to substantial pollutant concentrations?

Construction activities associated with either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative, along with the identified Access Option, would generate emissions of criteria pollutants over a phased and intermittent construction period, including suspended particulate matter and equipment exhaust emissions. These construction-related emissions would be limited to the construction period but would still cause adverse effects on the local air quality. Incorporation of appropriate mitigation measures would reduce the impacts to a **less than significant** level under CEQA. Please refer to Section 3.2.6 for more information on this topic.

Would the project create objectionable odors affecting a substantial number of people?

Objectionable odors may occur during the construction phase of the Build Alternatives due to use of heavy diesel-fueled equipment; however, this is a temporary exposure and would not be expected to affect a substantial number of people. Please refer to Section 3.2.6 for more information on this topic.

4.3.3.4 Biological Resources

Would the project 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 by the California Department of Fish and Game or US Fish and Wildlife Service?

Construction of either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative would cause temporary impacts to Salt Marsh Harvest Mouse

(SMHM) habitat [0.02 ha (0.05 ac)].. California red legged frog (CRLF) habitat is present within the project area and the Build Alternatives may directly impact potential, but marginal, habitat Construction within the project area would permanently impact approximately 82.47 ha (203.78 ac) and temporarily impact approximately 1.34 ha (3.16 ac) of upland habitat. Incorporation of avoidance and minimization measures would reduce impacts to CRLF habitats to **less than significant**. Study results will be reported in the final environmental document along with the USFWS Biological Opinion in Appendix N. Please refer to Section 3.3.6 for more information on this topic.

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations by the California Department of Fish and Game or US Fish and Wildlife Service?

Construction of either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative would result in the removal of riparian and native oak trees. However, incorporation of mitigation measures would reduce impacts to a **less than significant** level under CEQA. Please refer to Section 3.3.2 for more information on this topic.

Potential impacts on nesting birds could be considered adverse if construction occurs in the proximity of nesting birds. However, adherence to avoidance measures, such as a qualified biologist conducting nesting surveys prior to vegetation removal, would ensure that impacts to nesting birds would be reduced to a **less than significant** level.

Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act?

Construction of either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative would permanently impact between 2.86 and 3.06 ha (7.08–7.60 ac) of wetlands and temporarily impact between 0.86 and 0.97 ha (2.13-2.40 ac) of wetlands. Temporary impacts to other Waters of the US would be between 0.24 and 0.28 ha (0.57 and 0.67 ac), and permanent impacts would be from 1.16 to 1.29 ha (2.83 to 3.16 ac) depending on Access Option. Access Options 4b and 12b would involve the greatest impact to wetlands and waters of the US, 5.23 ha (12.9 ac), while Access Option 14b would involve the least impact, 4.87 ha (12.03 ac). However, through implementation of the appropriate

mitigation under either Build Alternative, these impacts would be reduced to a **less than significant** level under CEQA. Please refer to Section 3.3.3 for further discussion of this topic.

Would the project interfere substantially with the movement of any native resident, migratory fish or wildlife species?

The Build Alternatives would permanently impact 0.47 ha (1.16 ac) of Central California coast steelhead and California Coast Chinook salmon habitat, 0.20 ha (0.49 ac) of green sturgeon habitat, and 0.257 ha (0.63 ac) of Sacramento splittail habitat. Adherence to avoidance and minimization measures, such as allowing bridge work only during low flow periods, would not disrupt fish migration and would reduce impacts to a **less than significant** level. See Section 3.3.6 and the NOAA Biological Opinion for more information on this topic.

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with establish native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The MSN Project area currently provides an abundance of nesting habitat for many species of birds. For instance, bridges provide habitat for cliff swallows. Several large nests have been observed in a stand of eucalyptus trees adjacent to San Antonio Road and have been identified as potential raptor nests. A snowy egret, great egret, and great blue heron rookery is also present along the Petaluma Boulevard.

Modifications were made under the Preferred Alternative to decrease the radius of the ramp along Petaluma Boulevard in order to minimize impacts to the rookery; however, it was not possible to avoid the rookery entirely. Minimization measure will be employed where feasible to avoid further impacts to the rookery during final design and during project construction.

In accordance with the Migratory Bird Treaty Act, the contractor will conduct tree trimming and removal first and foremost outside of the nesting bird season of February 15-September 1. Trees may be identified for removal during the nesting season only if a qualified biologist has surveyed the trees and confirmed that there are no active nests present within the trees identified for removal or immediately adjacent. If any active nests are identified during this period, the trees cannot be disturbed for the duration of the nesting season. Although it is true that the project

will impact a substantial number of trees under the Build Alternatives, many more trees will remain in the project area that can provide alternative nesting habitat. A tree replacement plan will also be implemented, particularly in Segment B wherever it is feasible, but plantings may take 10-20 years to reach maturity (see Appendix J). Therefore, impacts to nesting bird habitat would be **less than significant.**

Would the project conflict with any local policies or ordinances protecting biological resource, such as a tree preservation policy or ordinance?

The Build Alternatives would result in the removal of substantial numbers of trees within all three segments. Under either the Fixed HOV lane or Reversible HOV lane alternative, oak tree removal would range from approximately 439 to 569 trees. In the Central Segment, tree removal would vary depending on the Access Option identified. The impact of Access Option 12b would be the greatest with the removal of 441 native oak trees, while Access Option 14d would have the least impact with the removal of 311 oak trees. These numbers are preliminary and will be revised during the final design process. Efforts to minimize impacts to oaks will be made both during the design process as well as the construction process.

The Oak Woodlands Conservation Environmental Quality Act recognizes the importance of oak woodlands. The MSN Project would comply with the OWCEQ by mitigating for oak trees that would be removed under the Build Alternatives through conservation covenants.

The Marin County General Plan (1994, as amended), Policy EQ 3.14, indicates that the county shall strive to protect large trees, trees with historical importance, and oak woodland habitat, and prevent the untimely removal of trees through implementation of tree preservation ordinance.

The Sonoma County General Plan (1989, as amended), includes the County's policy for community separators. Goal OS-1 as stated proposes to preserve visual identities of communities by maintaining open space areas between cities and communities."

Although tree loss has been substantially reduced, Caltrans will continue to limit impacts to trees where practicable throughout the design process. In accordance with Sonoma County, the MSN Project would maintain community separators.

Implementation of tree mitigation measures would be developed in consultation with CDFG would reduce these impacts to a **less than significant** level. Please refer to Sections 3.1.11 and 3.3.2 for more information on this topic.

4.3.3.5 Cultural Resources

Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Construction of either the Fixed HOV Lane Alternative or the Reversible HOV Lane Alternative would have an adverse effect on two site complexes in the Area of Potential Effects. The site complex near Olompali SHP, three sites of which are eligible for the National Register of Historic Places would be entirely or partly destroyed by construction of the project. Mitigation, including the recovery of significant data that would be destroyed by construction, would reduce this impact to a **less than significant** level. Please refer to Section 3.1.12 for more information on this topic.

Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Located near the project area is the Wilson Grove Formation, a known fossil resource. As there is low potential for fossil occurrence in the project area, the impact on paleontological resources is **less than significant**. Avoidance and minimization measures will be utilized. As excavation for construction gets underway it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a Construction Change Order (CCO) will be prepared in order to have a qualified Principal Paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation will be employed.

Would the project disturb any human remains, including those interred outside of formal cemeteries?

During project development, Caltrans modified the Build Alternatives to avoid and minimize project-related impacts to cultural resources; however, total avoidance of archaeological resources is not achievable due to the scale of the proposed construction, tight grade areas, and turning constraints. To resolve adverse effects of the proposed project on archaeological sites, Caltrans has consulted with the SHPO and interested Native American groups. A

Memorandum of Agreement (MOA) has been developed to identify mechanisms for treatment of historic properties, primarily through recovery of significant data that would be destroyed by construction of the project (Appendix D). The MOA will also outline the process for finishing identification of subsurface contexts that might contain historic properties that might be affected by the project and will also outline procedures for treatment of historic properties inadvertently discovered during construction.

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

4.3.3.6 Geology and Soils

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

The Fixed HOV Lane and Reversible HOV Lane Alternatives would be constructed in a seismically active area. All structures included under the Build Alternatives and Access Options would be designed to withstand the largest magnitude earthquake (7.0) the active Rodgers Creek Fault is capable of producing, thereby minimizing potential adverse effects related to ground shaking, ground failure, and liquefaction. As a result, impacts related to seismic events are considered to be **less than significant**.

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

Slope stability in the Northern and Southern Segments would not be a concern for the Build Alternatives because of the generally level terrain in these stretches. However, slope stability hazards, such as landslides, in the Segment B, especially in areas where cuts are proposed, may be of concern. Embankments would be stabilized and appropriate cut/embankment slope ratios and benches would be analyzed during final design for the preferred Build Alternative and Access Option. Therefore risk due to landslide is considered a **less than significant** impact.

Would the project result in substantial soil erosion or the loss of topsoil?

There would be no significant increase in soil erosion as a consequence of the Build Alternatives. Materials used for any embankment or foundation construction would conform with standard specifications to ensure proper soil settlement. Adherence to Caltrans specifications and the NPDES permit under which Caltrans would construct and operate the Build Alternatives and Access Options would result in **less than significant** erosion impacts.

Would the project 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?

Standard design and construction methods would minimize impacts associated with unstable soils. Soil settlement problems associated with the Build Alternatives and the Access Options would be avoided by various standard engineering practices, such as the removal of soft soils, soil mixing, wick drains, lightweight fill, grouting, or stone columns. As a result, geotechnical and soil limitations would be addressed and result in **less than significant** impacts.

Would the project 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?

Soils with the Central Segment are subject to expansion and contraction when going from wet to dry conditions. Standard construction techniques for dealing with this soil type would ensure that potential effects of the Build Alternatives and the Access Options are **less than significant**.

For more information on Geology and Soils, please refer to Section 3.2.4.

4.3.3.7 Hazards and Hazardous Materials

Would the project 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?

While US 101 operations under either the Fixed HOV Lane or Reversible HOV Lane Alternatives would not result in hazardous conditions due to accidental releases of hazardous materials, the activities related to construction of the project could release hazardous materials into the environment. During the construction phase of the preferred Build Alternative and Access Option, there would be ground disturbance that could release aerially deposited lead in surface soils adjacent to the edge of the existing pavement; lead and other potentially toxic substances found in the yellow traffic striping and/or pavement markings; naturally occurring asbestos; and mercury from mine tailings. In addition, demolition or modification of bridge structures that may contain man-made asbestos could release asbestos fibers into the air.

Finally, these hazardous materials, as well as contaminated ground water from dewatering activities, would be transported for proper disposal. In the event of an accident, the materials could be released into the environment. Without proper precautions, exposure to these hazardous materials could become human health hazards.

Implementation of mitigation measures including compliance with existing state and federal laws pertaining to the handling and disposal of hazardous materials would reduce these impacts to a **less than significant** level. Please refer to Section 3.2.5 for more information on this topic.

Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous material?

All potential hazardous waste, (naturally occurring asbestos, contaminated groundwater, aerially deposited lead, among others) generated during construction of the Build Alternatives would be transported and disposed in accordance with existing state and federal laws pertaining to the handling and disposal of hazardous materials, which would reduce hazards to a **less than significant** level. Please refer to Section 3.2.5 for more information on this topic.

Would the project 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 Preliminary Site Investigation (PSI) was completed for the Build Alternatives in 2006. There are 71 known or suspected areas of contamination located within or adjacent to the project footprint. Disturbance of these areas could result in exposure to environmental contamination that could adversely affect humans and the environment. For areas proposed for acquisition, Caltrans would prepare, during the design phase, site-specific Phase I Environmental Site Assessments (ESA) in accordance with the requirements of the Final Rule for All Appropriate inquiries promulgated as an amendment to Community Environmental Response, Compensation, and Liability Act. A Phase I ESA will provide information to determine if there is a reasonable expectation that the site is contaminated. If the Phase I ESA reveals that it is reasonable to expect that some contamination would be encountered, the potentially impacted sites would be further investigated and sampled, the constituents of concern identified, and potential impacts delineated in a Phase II ESA. Caltrans would make every effort to have the property owner or responsible party, investigate and clean-up the contamination prior to Caltrans acquisition.

For those sites not proposed for acquisition where environmental contamination may occur as determined by the PSI or by discovery of mercury mine tailings, aerially deposited lead, or naturally occurring asbestos, the construction contracts for the proposed project would require the development and implementation of plans to safeguard human health and the environment. These plans are stipulated in existing hazardous materials regulations and include a Waste Management and Disposal Plan, a Health and Safety Plan, and a Stormwater Pollution Prevention Plan.

Given the existence of existing plans and regulations to avoid or reduce hazardous materials exposure and health risks, the impact of hazardous materials exposures is considered to be **less than significant**.

For a project located within an airport land use plan or 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?

The project is located less than 1.25 km (2 mi) from the Marin County Gnoss Field Airport. However, the Fixed HOV Lane and Reversible HOV Lane Alternatives and the various Access Options propose roadway improvements exclusively for transportation purposes and does not run the same risk of being involved in a severe air traffic incident as a site of public aggregation such as a school or public building. Therefore, potential impacts to local residents or the airport would be **less than significant** under CEQA.

Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Caltrans would coordinate with emergency service providers (e.g., police, fire, hospital, etc.) to develop a traffic management plan to ensure no disruptions occur to vital emergency services during construction of the preferred Build Alternative and Access Option. Implementation of the traffic management plan would reduce potential significant impacts to **less than significant** under CEQA On completion, the Fixed HOV Lane and Reversible HOV Lane Alternatives would not impair, but rather improve, the efficiency of emergency response by alleviating congestion along US 101, enabling greater maneuverability for emergency vehicle route, increasing the shoulder-width along the mainline-for emergency stops, and eliminating the at-grade connections in the Central Segment that interfere with continuous traffic movements. Thus, potential impacts to emergency response plans would be **beneficial** under CEQA.

4.3.3.8 Hydrology and Water Quality

Would the project 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)?

Proposed grading required for the Fixed HOV Lane and the Reversible HOV Lane Alternatives may have localized impacts to the flow of groundwater. However, because the affected ground water basins are so large, the localized impacts would have **less than significant** effects on the overall direction or rate of ground water flow towards San Pablo Bay.

The addition of impervious surfaces from the widened freeway facilities would reduce the areas that serve to recharge groundwater. . In the Central Segment, increase in impervious surface would vary depending on the Access Option. The impact of Access Option 12b would be the greatest with the addition of 14.0 ha (34.6 ac) of impervious surface, while Access Option 4b would have the least impact with the addition of 11.5 ha (28.3 ac) of impervious surface. However, as noted above, the impact would be minimal because the increase is relatively small when compared to the extensive recharge areas for local ground water basins.

Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

The Fixed HOV Lane and Reversible HOV Lane Alternatives pass through or lie adjacent to several flood hazard areas. However, the Build Alternatives would not increase flood hazards or diminish the 100-year floodplain. The Build Alternatives would be designed to minimize encroachment into the floodplain. In addition, culverts would be designed and/or upgraded to enable upstream areas to drain more quickly and efficiently. As a result, it is expected that the 100-year floodplain would not increase hazards for US 101, and the Build Alternatives would not exacerbate flooding. Consequently, potential flood hazards as a result of the Build Alternatives and Access Options would be **less than significant**. For more information on this topic, please refer to Section 3.2.2.

Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality?

For both the Fixed HOV Lane and Reversible HOV Lane Alternatives, increased sediment load, construction activities in the waterways, and accidental spills would all trigger temporary water quality deterioration and, in the short term, compromise maintenance of the water quality objectives that are established to protect the beneficial water uses of the water bodies in the MSN project area.

Unmitigated, the increased pollutant loading from storm water runoff could adversely affect their identified beneficial uses.

Caltrans' adherence to statewide Construction General Permit (Order No. 98-08-DWQ, CAS000002), the required Storm Water Pollution Prevention Plan, and Construction Site Best Management Practices (BMPs) would be incorporated to reduce the discharge of pollutants during construction to the maximum extent

practicable. Implementation of these measures would reduce water quality, construction impacts of the Build Alternatives to **less than significant**.

Caltrans' adherence to statewide NPDES Storm Water Permit to regulate discharges from Caltrans facilities (Order No. 99-06-DWQ, CAS000003) which includes the implementation of permanent BMPs would reduce the discharge of pollutants over the life of the MSN Project to the maximum extent practicable. Furthermore, in compliance with Caltrans' NPDES requirements, water quality BMPs and drainage facilities would be included where practicable. Implementation of the appropriate mitigation measures would reduce permanent water quality impacts of the Fixed HOV Lane and Reversible HOV Lane Alternatives to **less than significant**.

Would the project 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 flooding on-or off-site, or result in substantial erosion or siltation on-or off-site or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site?

The Fixed HOV Lane and Reversible HOV Lane Alternatives would traverse areas that are characterized by high erosion hazards and subject to flooding. Perennial waterways crossed by the Build Alternatives include Petaluma River, San Antonio Creek, Basalt Creek, Rush Creek, and Novato Creek. However, replacement bridges that are part of the MSN Project would not further constrict the channels, and therefore not increase flow velocity through the bridges. The Build Alternatives and the Access Options would increase the paved surface of the area of the freeway corridor and thereby could increase storm water runoff to the regions historically affected by flooding.

Adherence to the Caltrans NPDES permit that requires preparation of a SWPPP and implementation of BMPs (particularly the earlier identified design pollution prevention measures) would mitigate alterations to the drainage pattern that would substantially increase erosion or siltation. In addition, several methods of detaining storm water runoff are being considered to ensure that storm water runoff volumes are maintained at existing levels. These measures collectively would reduce the impact related to alteration to drainage patterns to a **less than significant** level.

Would the project 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?

The Build Alternatives would create approximately 83 ha (205 ac) of new impervious area, according to the Preliminary Drainage Report (Caltrans, 2006). As a result, storm waters that would otherwise have percolated into the ground would be expected to run off the new roadways, carrying pollutants that had accumulated on the roadway surface. In the Central Segment, increase in impervious surface would vary depending on the Access Option. The impact of Access Option 12b would be the greatest with the addition of 14.0 ha (34.6 ac) of impervious surface, while Access Option 4b would have the least impact with the addition of 11.5 ha (28.3 ac) of impervious surface.

In order to mitigate runoff impacts, the Build Alternatives would include upgrading all undersized drainage facilities as needed to address increased flows due to the additional impervious areas. In addition, increased runoff volumes from roadway widening would be captured and held in appropriately designed detention facilities, so that most construction runoff can be maintained at existing levels.

Finally, treatment and permanent erosion control BMPs would be implemented to the maximum extent practicable. These measures collectively would reduce the impact related to increased runoff to a **less than significant** level.

4.3.3.9 Mineral Resources

Would the project 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?

Under Access Options 12b, 4b, and 14d, a portion of a quarry on the Silveira property would be acquired for an access road. Caltrans will seek to reduce this impact; however, in terms of loss of availability of mineral resources to the state this impact would be **less than significant**.

4.3.3.10 Noise

Does the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Temporary and intermittent noise from construction activities would most likely impact sensitive noise receptors in the urbanized areas of Novato and Petaluma. Caltrans would identify sensitive noise receptors during the design phase based upon construction activities. Specific mitigation measures would be proposed which may include, but not be limited to, installing shrouds to temporarily reduce noise. Construction activities would conform to the latest Standard Specifications listed in Section 7-1.011 of Caltrans' Sound Control Requirements. As a result, temporary increases in ambient noise conditions in the project corridor would be reduced to **less than significant**. Please refer to Section 3.2.7 for more information on this topic.

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Under the Fixed HOV Lane and the Reversible HOV Lane Alternatives, the predicted future peak noise levels along US 101 would increase by approximately one to two dBA Leq(h). This would be considered a **less than significant** increase in traffic noise. Although the Build Alternatives would not result in a significant increase in traffic noise, noise abatement is under consideration at some locations. For more information on this topic, please refer to Section 3.2.7.

For a project located 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?

The Marin County Gnoss Field Airport is in the vicinity of the expressway corridor, an area of rural land uses. The US 101 would be shifting eastward closer to the airport; however, neither the freeway nor the airport are considered sensitive receptor than would warrant special consideration for potential noise impacts. Under the Build Alternatives, construction noise and traffic noise would be **less than significant** under CEQA.

4.3.3.11 Population and Housing

Would the project displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?

The Fixed HOV Lane and Reversible HOV Lane Alternatives would cause one potential residential displacement within the Central Segment. Caltrans would provide the appropriate relocation benefits to any property owner impacted by the

acquisition of their property under the Build Alternatives. Because the displacement would not involve a substantial number of people, the impact is considered to be less than significant.

4.3.3.12 Recreation

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?

The Fixed HOV Lane Alternative and the Reversible HOV Lane Alternatives include the construction of bicycle/pedestrian lanes to replace bicycle access that currently exists on the expressway shoulder in the Central Segment.

The effects of these lanes are evaluated as part of the Build Alternatives. During construction, bicycle/pedestrian access may be interrupted; however, Caltrans would provide alternative routes during construction to reduce temporary closure of access roads to a **less than significant** level. Please refer to Section 3.1.10 for further discussion of Bicycle/Pedestrian facilities.

4.3.3.13 Transportation and Traffic

Would the project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e. result in a substantial increase in congestion at intersections) or exceed a level of service standard established by the county congestion management agency for designated roads?

Caltrans included the US 101 Southbound and Northbound Ramps at the Atherton Avenue Intersections in the MSN Highway Operations study due to their close proximity to the Atherton Avenue/Redwood Boulevard intersection. Performance at the studied intersections is partially dependent upon operations at the Atherton Avenue/Redwood Boulevard intersection, where the westbound storage load is inadequate under existing conditions. The study determined that traffic at the US 101 Southbound ramps would operate at Level of Service (LOS) B during A.M. peak, and LOS A in the P.M. peak in Year 2030. Northbound ramps would operate at LOS C in the A.M. peak and LOS D in P.M. peak in Year 2030. According to the Marin County CMP, that establishes LOS standards, non-freeway routes on the designated system must maintain an LOS D or better. Therefore, this impact would be **less than significant** under CEQA.

In addition, there is a causal connection between the South Petaluma Boulevard bottleneck that the MSN Project is alleviating and the latent bottleneck south of Miller Creek as shown in Figure 3.1-11. However, the impact of this bottleneck is **less than significant** as the MSN Project would reduce delay and increase productivity through the 16.1-mile project area.

Would the project result in inadequate parking capacity?

The Build Alternatives would impact a small portion of the large parking lot at the Plaza North Shopping Center in Petaluma; however, there is sufficient room to reconfigure parking spaces for no net loss in the parking supply. There would be some minor temporary impacts to three Park and Ride Lots due to construction of either of the Build Alternatives. Therefore, impacts to parking due to the Build Alternatives would be **less than significant** under CEQA.

Would the project result in inadequate emergency access?

Caltrans would coordinate with emergency service providers (e.g., police, fire, hospital, etc.) to develop a traffic management plan to ensure no disruptions occur to vital emergency services during construction of the preferred Build Alternative and Access Option. Implementation of the traffic management plan would reduce potential significant impacts to **less than significant** under CEQA. Please refer to Section 3.1.8 for more information on this topic.

4.3.4 Topics that were Found to be Beneficial or have No Impact

A complete list of topics that were found to have beneficial or no impacts is found in Appendix K, CEQA Checklist, of this report. A partial list is presented below. The proposed project would not:

- Conflict with adopted policies, plans, or programs, including those concerning support for alternative transportation modes, land use and development policies, biological habitat protection and conservation.
- 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.
- Expose persons to long-term noise levels in excess of Caltrans standards
- Result in loss of mineral resources and conflict with mineral resource plans.

- Adversely affect fire protection, police protect, schools, parks, and other public facilities or utility systems.

- Conflict with adopted policies, plans or programs supporting alternative transportation.

- Require or result in the construction of new wastewater or stormwater facilities that would cause significant effects.

- Require additional water supplies or exceed the capacity of local wastewater treatment providers, or exceed wastewater treatment requirements.

4.3.5 Growth Inducing Impacts

The Build Alternatives would improve traffic conditions and travel times through the project area and vicinity. The Fixed HOV Lane Alternative would eliminate delay in HOV lanes, allowing the HOV lane users to travel at or very near free-flow speeds through the project area. Since the Reversible HOV Lane Alternative would not improve effective capacity in the reverse commute direction (northbound in the morning and southbound in the evening), there would be no travel time savings for traffic from Hamilton Field, Miller Creek and Central Sonoma County. Furthermore, the mixed flow lanes within the project boundaries would not be operating at free-flow speed during peak hours and would still experience congestion and delay. Therefore, growth would not be induced entirely by the HOV free-flow speeds. Hence, while the Fixed HOV Lane Alternative would support some of the planned growth in the area, it would not fully accommodate planned growth or induce unplanned growth. Other factors, in addition to traffic conditions, that influence growth, are local plans and policies that control local land use and undevelopable lands within their jurisdictions and the cost and availability of housing. In consideration of these factors, the growth inducing impacts of the MSN Project would be **less than significant**. Please see Section 3.1.4 for further information on this topic.

As noted in Section 3.1.8 of this FEIR/S, utility relocations will be necessary under the Build Alternatives due to the shifting of the US 101 mainline, occurring primarily in Segment B of the MSN Project boundaries, and not as a result of growth inducing impacts. Service expansion or facility upgrades by PG&E, Sonoma County Water Agency, North Marin Water District, or Marin Municipal

Water District would be separately planned actions by these agencies and, as such, are not addressed in this FEIR/S.

4.3.6 Climate Change

4.3.6.1 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[1] (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 year 2020, and (3) 80 percent 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-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

[1] Greenhouse gases related to human activity, as identified in AB 32, 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; at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. However, California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHGs as a pollutant under the Clean Air Act (Massachusetts vs. Environmental Protection Agency et al., U.S. Supreme Court No. 05-1120. 549. Argued November 29, 2006—Decided April 2, 2007). The court ruled that GHGs do fit within the Clean Air Act's definition of a pollutant, and that EPA does have the authority to regulate GHGs. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting greenhouse gas emissions.

According to recommendations by the Association of Environmental Professions on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Figure 4-1 is a graph from that update showing the total GHG emissions for California for 1990, 2009-2004 average, and 2020 projected if no action is taken.

Figure 4-1 California GHG Inventory Forecast

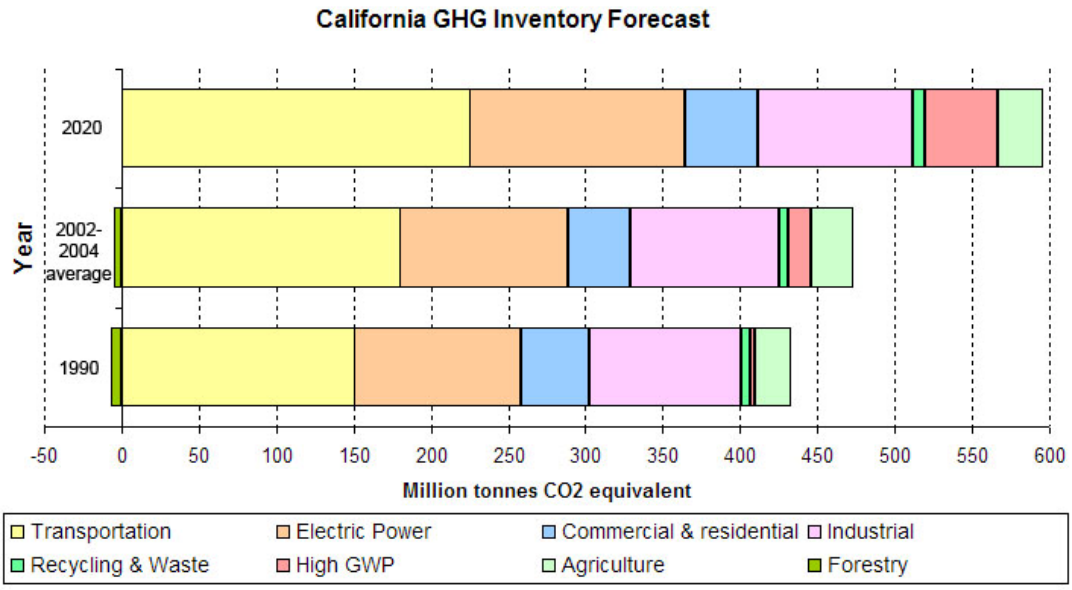


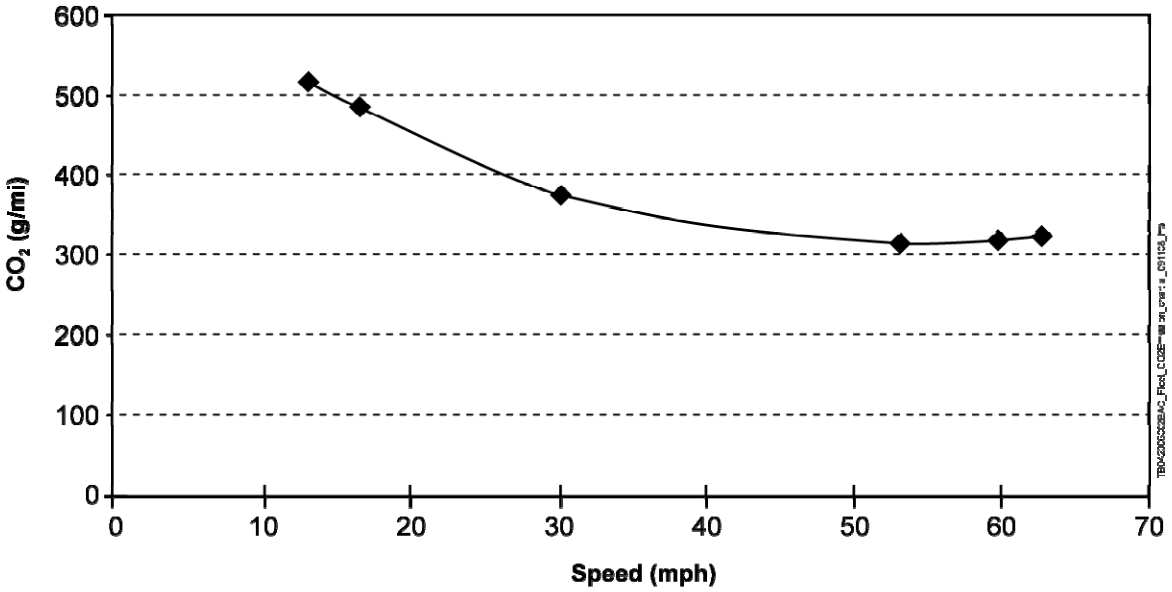
Figure taken from http://www.arb.ca.gov/cc/inventory/data/forecast.htm

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 is implementing the Climate Action Program, published in December 2006. This document can be found at http://www.dot.ca.gov/docs/ClimateReport.pdf.

Project Analysis

One of the main strategies in the Department's 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 mph) and speeds over 55 mph, with the most severe emissions occurring from 0-25 mph (see Figure 4-2 below). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO_2, may be reduced.

Figure 4-2 Fleet CO_2 Emission vs. Speed (Highway)



Source: Center for Clean Air Policy – http://www.ccap.org/Presentations/Winkelman%20TRB%202004%220(1-13-04).pdf

As stated in the alternatives analysis of this document, HOV lanes under the Build Alternatives would capitalize on the productivity trends in Sonoma and Marin Counties (Section 2.6.6). Furthermore, the performance and efficiency of HOV lanes would substantially improve travel time for carpooling commuters and transit, as they would operate at speeds of 65 mph in new HOV lanes vs. 9 mph in congested mixed flow lanes under the No Build Alternative (Section 3.2.8). Moreover, the Fixed HOV Lane (the Preferred Alternative) could reduce peak-hour delay by 2.5 to 7.2 minutes (49 to 76 percent), and by as much as 89 percent at some bottlenecks (Section 3.2.8).

Quantitative Analysis

Caltrans has conducted a quantitative analysis using the EMFAC model, the same model used to conduct project-level air quality analysis. Due to the limitations with the EMFAC model discussed below, the CO_2 emissions presented in Table 4-2 are useful principally for a comparison between the project alternatives. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions will be.

Table 4-2 Comparison of CO_2 Emissions between Build and No Build Alternatives

Year	Existing (2009/10)	No-Build Alternative in 2030	Either Build Alternative in 2030
Total CO_2 Emissions (US Tons)	569.2	611.5	777.9

Impacts Discussion

Fixed HOV Alternative. According to the modeling**,** CO_2 emissions under the Build Alternatives would be increased over existing levels and also the No Build in 2030.

Reversible HOV Alternative. Reduced travel time due to HOV lanes would be similar under the Reversible HOV alternative as under the Fixed HOV Alternative. Therefore, emissions under this alternative are anticipated to be roughly the same as those estimated for the Fixed HOV Alternative above.

Access Options. Any of the Access Options would be compatible with either Build Alternative. The Access Options would provide for new interchanges, overcrossings, and frontage roads that largely seek to replace at-grade connections to US 101. As stated in Section 3.1.4 Growth, based upon limits to access roads proposed under the Build Alternatives, and continued stability of land use zoning toward agricultural and open space land uses in Segment B, most traffic will continue to be destined for the city of Novato and southward or the city of Petaluma and northward. Therefore, the CO_2 emissions estimates in Table 4-2 under the Fixed HOV and Reversible HOV Alternatives also include the CO_2 emissions resulting from either of the Access Options (4b, 12b, 14b, or 14d), and no separate evaluation is needed.

No Build Alternative. No Build Alternative would require routine maintenance of US 101, and would not include congestion-relieving improvements. As shown in Table 4-2, even the No Build Alternative is anticipated to have increased CO_2 emissions when compared to existing conditions.

Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting CO_2 emissions. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008), studies have revealed that brief but rapid accelerations can contribute significantly to a vehicle's carbon monoxide and hydrocarbon emissions during a typical urban trip. Current emission-factor models are insensitive to the distribution of such modal events (i.e., cruise, acceleration, deceleration, and idle) in the operation of a vehicle and instead estimate emissions by average trip speed. This limitation creates an uncertainty in the model's results when compared to the estimated emissions of the various alternatives with baseline in an attempt to determine impacts. Although work by EPA and the CARB is underway on modal-emission models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling. In addition, EMFAC does not include speed corrections for most vehicle classes for CO_2 – for most vehicle classes emission factors are held constant which means that EMFAC is not sensitive to the decreased emissions associated with improved traffic flows for most vehicle classes. Therefore, unless a project involves a large number of heavy-duty vehicles, the difference in modeled CO_2 emissions due to speed change will be slight.

It is interesting to note that CARB is currently not using EMFAC to create its inventory of greenhouse gas emissions. It is unclear why the CARB has made this decision. Their website only states:

> REVISION: Both the EMFAC and OFFROAD Models develop CO_2 and CH_4 [methane] emission estimates; however, they are not currently used as the basis for [CARB's] official [greenhouse gas] inventory which is based on fuel usage information. However, ARB is working towards reconciling the emission estimates from the fuel usage approach and the models.

Other Variables

With the current science, project-level analysis of greenhouse gas emissions is limited. Although a greenhouse gas analysis is included for this project, there are

numerous key greenhouse gas variables that are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2008 (http://www.epa.gov/oms/fetrends.htm)," which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy has improved each year beginning in 2005, and is now the highest since 1993. Most of the increase since 2004 is due to higher fuel economy for light trucks, following a long-term trend of slightly declining overall fuel economy that peaked in 1987. These vehicles also have a slightly lower market share, peaking at 52 percent in 2004 with projections at 48 percent in 2008. Table 4-3 shows the alternatives for vehicle fuel economy increases studied by the National Highway Traffic Safety Administration in its Final EIS for New Corporate Average Fuel Economy (CAFE) Standards (October 2008).

Table 4-3 Model Year 2015 Required Miles Per Gallon (mpg) by Alternative

No Action		25% Below Optimized	Optimized (Preferred)	25% Above Optimized	50% Above Optimized	Total Costs Equal Total Benefits	Technology Exhaustion
Cars	27.5	33.9	35.7	37.5	39.5	43.3	52.6
Trucks	23.5	27.5	28.6	29.8	30.9	33.1	34.7

Second, near zero carbon vehicles will come into the market during the design life of this project. According to a March 2008 report released by University of California Davis (UC Davis), Institute of Transportation Studies:

> "Large advancements have occurred in fuel cell vehicle and hydrogen infrastructure technology over the past 15 years. Fuel cell technology has progressed substantially resulting in power density, efficiency, range, cost, and durability all improving each year. In another sign of progress, automotive developers are now demonstrating over 100 fuel cell vehicles (FCVs) in California – several in the hands of the general public – with configurations designed to be attractive to buyers. Cold-weather operation and vehicle range challenges are close to being solved, although vehicle

cost and durability improvements are required before a commercial vehicle can be successful without incentives. The pace of development is on track to approach pre-commercialization within the next decade.

"A number of the U.S. DOE 2010 milestones for FCV development and commercialization are expected to be met by 2010. Accounting for a five to six year production development cycle, the scenarios developed by the U.S. DOE suggest that 10,000s of vehicles per year from 2015 to 2017 would be possible in a federal demonstration program, assuming large cost share grants by the government and industry are available to reduce the cost of production vehicles."[2]

Third and as previously stated, California has recently adopted a low-carbon transportation fuel standard. CARB is scheduled to come out with draft regulations for low carbon fuels in late 2008 with implementation of the standard to begin in 2010.

Fourth, driver behavior has been changing as the U.S. economy and oil prices have changed. In its January 2008 report, "Effects of Gasoline Prices on Driving Behavior and Vehicle Market," (http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf) the Congressional Budget Office found the following results based on data collected from California: 1) freeway motorists have adjusted to higher gas prices by making fewer trips and driving more slowly; 2) the market share of sports utility vehicles is declining; and 3) the average prices for larger, less-fuel-efficient models have declined over the past five years as average prices for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles.

Limitations and Uncertainties with Impact Assessment

Taken from p. 3-70 of the National Highway Traffic Safety Administration Final EIS for New CAFE Standards (October 2008), Figure 4-3 illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

"Cascade of uncertainties typical in impact assessments showing the "uncertainty explosion" as these ranges are multiplied to encompass a comprehensive range of

[2] Cunningham, Joshua, Sig Cronich, Michael A. Nicholas. March 2008. Why Hydrogen and Fuel Cells are Needed to Support California Climate Policy, UC Davis, Institute of Transportation Studies, pp. 9-10.

future consequences, including physical, economic, social, and political impacts and policy responses."

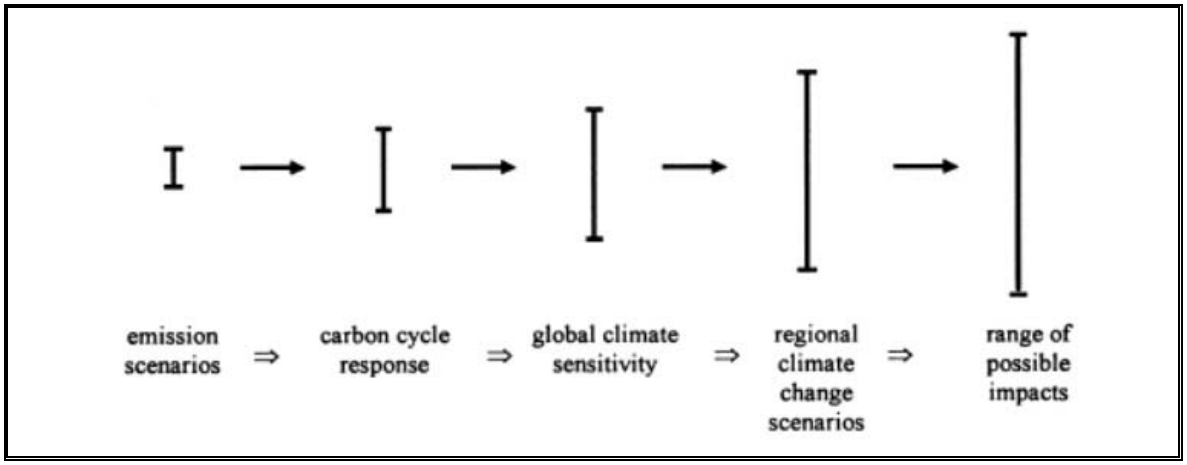


Figure 4-3 Cascade of Uncertainties

Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO_2 equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce greenhouse gas emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO_2 from 2000 to 2030, which represents an increase of between 25 and 90%.[3]

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather

[3] Intergovernmental Panel on Climate Change (IPCC). February 2007. Climate Change 2007: The Physical Science Basis: Summary for Policy Makers. http://www.ipcc.ch/SPM2feb07.pdf.

than causing "new" greenhouse gas emissions. It is difficult to assess the extent to which any project level increase in CO_2 emissions represents a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

The complexities and uncertainties associated with project level impact analysis are further borne out in the recently released Final EIS completed by the National Highway Traffic Safety Administration CAFE standards, October 2008. As the text quoted below shows, even when dealing with greenhouse gas emission scenarios on a national scale for the entire passenger car and light truck fleet, the numerical differences among alternatives is very small and well within the error sensitivity of the model.

> "In analyzing across the CAFE 30 alternatives, the mean change in the global mean surface temperature, as a ratio of the increase in warming between the B1 (low) to A1B (medium) scenarios, ranges from 0.5 percent to 1.1 percent. The resulting change in sea level rise (compared to the No Action Alternative) ranges, across the alternatives, from 0.04 centimeter to 0.07 centimeter. In summary, the impacts of the model year 2011-2015 CAFE alternatives on global mean surface temperature, sea level rise, and precipitation are relatively small in the context of the expected changes associated with the emission trajectories. This is due primarily to the global and multi-sectoral nature of the climate problem. Emissions of CO_2, the primary gas driving the climate effects, from the United States automobile and light truck fleet represented about 2.5 percent of total global emissions of all greenhouse gases in the year 2000 (EPA, 2008; CAIT, 2008). While a significant source, this is a still small percentage of global emissions, and the relative contribution of CO_2 emissions from the United States light vehicle fleet is expected to decline in the future, due primarily to rapid growth of emissions from developing economies (which are due in part to growth in global transportation sector emissions)." [NHTSA Draft EIS for New CAFE Standards, June 2008, pp.3-77 to 3-78]

CEQA Conclusion

As discussed above, both the future with project and future no build show increases in CO_2 emissions over the existing levels. As discussed above, there are limitations with EMFAC and with assessing what a given CO_2 emissions increase means for climate change. Therefore, it is Caltrans determination that in the

absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $107 in transportation funding during the next decade. As shown on Figure 4-4 below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

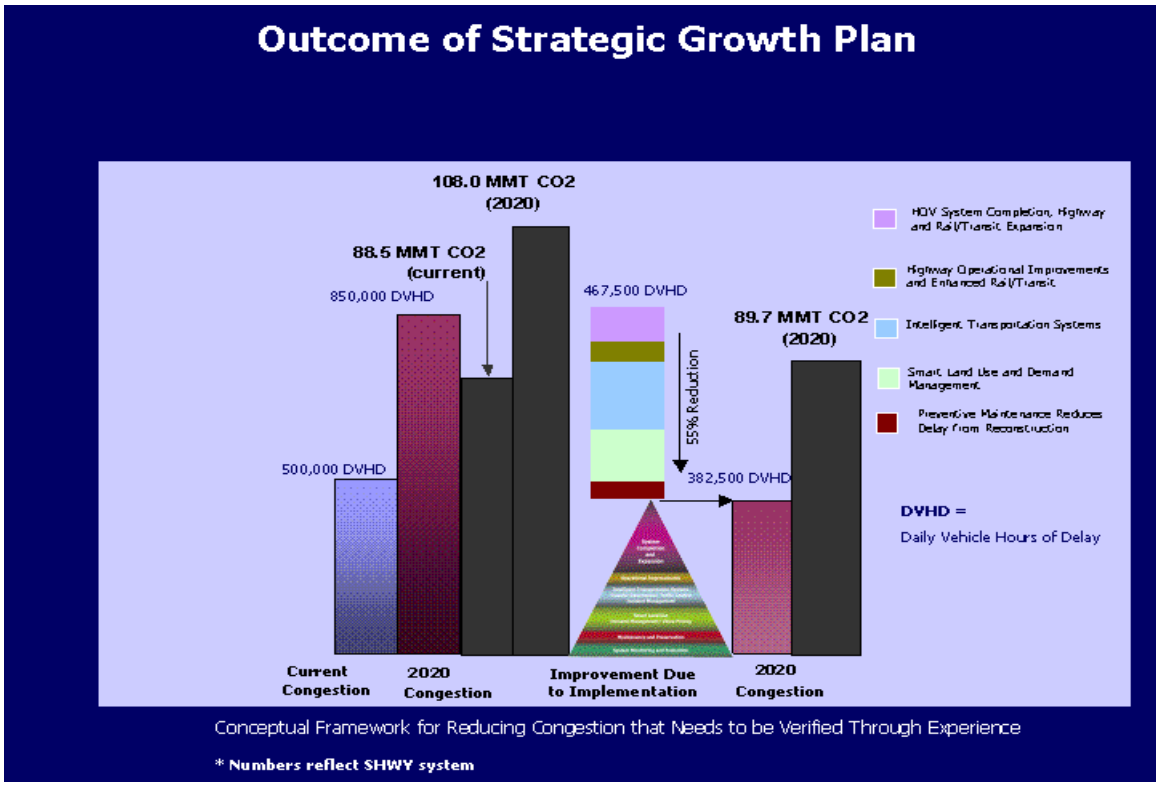


Figure 4-4 Outcome of Strategic Growth Plan

As part of the *Climate Action Program at Caltrans* (December 2006, http://www.dot.ca.gov/docs/ClimateReport.pdf), 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-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the UC Davis.

Table 4-4 summarizes efforts that Caltrans and other state agencies are implementing in order to reduce greenhouse gas emissions. For more detailed

Table 4-4 Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & Greenhouse Gas into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34

Table 4-4 Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

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information about each strategy, please see *Climate Action Program at Caltrans (December 2006);* it is available at http://www.dot.ca.gov/docs/ClimateReport.pdf.

To the extent that it is applicable or feasible for the MSN Project, the following measures can also help to reduce the GHG emissions and potential climate change impacts from the MSN Project:

1. Use of reclaimed water—currently 30 percent of the electricity used in California is used for the treatment and delivery of water. Use of reclaimed water helps conserve this energy, which reduces GHG emissions from electricity production.

2. Landscaping—reduces surface warming and through photosynthesis decreases CO_2.

3. Portland cement—use of lighter color surfaces such as Portland cement helps to reduce the albedo[4] effect and cool the surface. In addition, Caltrans has been a leader in the effort to add fly ash to Portland cement mixes. Adding fly ash reduces the GHG emissions associated with cement production—it also can make the pavement stronger.

4. Use of energy efficient lighting, such as LED traffic signals.

5. Idling restrictions for trucks and equipment.

4.3.7 Mandatory Findings of Significance

Does the project have impacts that are individually limited, but cumulatively considerable?

The project may contribute to cumulative impacts to the following resources: aesthetics, farmland/agriculture and cultural/archaeological. See Chapter 5 for more information.

[4]Albedo is defined as the ratio of diffusely reflected to incident electromagnetic radiation. It is a unitless measure indicative of a surface's or body's diffuse reflectivity. The classic example of albedo effect is the snow-temperature feedback. If a snow covered area warms and the snow melts, the albedo decreases, more sunlight is absorbed, and the temperature tends to increase. The converse is true: if snow forms, a cooling cycle happens (Wikipedia 9/18/08).

4.3.8 Mitigation Measures for Significant Impacts under CEQA

Table 4-5 summarizes mitigation measures for significant impacts under CEQA. For a complete summary of mitigation measures for all impacts under CEQA, please refer to Appendix J: Mitigation and Monitoring Reporting Form.

Table 4-5 Significant Impacts and Mitigation Measures

Potentially Significant Impacts	Mitigation Measures
Adverse effect from new soundwalls and accompanying tree and vegetation removal	Minimization of vegetation removal; replacement planting in combination with standard project landscaping; vine planting to cover walls on highway and community sides.
Adverse effect from new soundwalls and accompanying tree and vegetation removal.	Installation of lights underneath; architectural and landscape design determined with Policy Advisory Group.
Adverse impact from new interchanges, major grading, tree removal, and overcrossings.	Minimization of vegetation removal; replacement planting in combination with standard project landscaping; center median design treatments. All disturbed areas shall be provided with permanent erosion control grasses and appropriate locally native annual shrub and tree species. Areas of disturbed native vegetation shall be replaced at a 5 to 1 ratio wherever feasible. Where in-place planting is not practical, planting will be replaced, where feasible, off site in the visual foreground of the corridor.
Adverse impact from major landform alteration due to mainline realignment	Same as above. Also, contour grading and contour rounding shall be employed at slope transitions in all major grading activities, to minimize the artificial, engineered appearance of resulting slopes and to blend with the natural topography to the greatest extent feasible. Where the alignment of the freeway or ramps are to be superseded, existing pavement and roadbed shall be removed and contour graded to provide a natural appearance and blend with the adjacent landform, and graded areas re-vegetated. Trees and shrubs shall be planted at cut/fill transition areas to help screen or soften prominent grade transitions. Grading shall utilize techniques such as slope rounding, slope sculpting, and variable gradients to approximate the appearance of natural topography.
Adverse impact from new soundwalls, interchange ramp improvements, and auxiliary lane due to substantial decline in motorists' views and community character and to loss of tree hedgerows.	Minimization of artificial, engineered appearance of slopes to blend with natural topography; plantings and revegetation to screen slope transitions; revegetation of removed native vegetation at 5:1 ratio.