

3.1

Alternatives to the Project

Introduction

CEQA Guidelines require EIRs to consider a reasonable range of alternatives to a proposed Project or to the location of the proposed Project. These alternatives must “feasibly attain the basic objectives of the project” (CEQA Guidelines, Section 15126(a)). “Feasible” means that the alternatives “are capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors” (CEQA Guidelines, Section 15364). The EIR need not analyze these alternatives at the same level of detail that it analyzes the project itself. The Guidelines require only that the EIR analyze the comparative merits of the alternatives.

Section 15126 of the CEQA Guidelines outlines the range of alternatives that the EIR should analyze. All EIRs must assess a “No Project” Alternative. The No Project Alternative analyzes the effects of not approving the 2009 CTP, thus leaving in place only projects and programs that already have funding commitments. The range of alternatives is determined by the “rule of reason.” That is, the EIR needs to analyze only those alternatives that will help decision-makers make reasoned choices. The EIR should also focus on alternatives that reduce or eliminate the identified impacts of the proposed Project, even if those alternatives would impede to some degree the attainment of Project objectives or would be more costly. If the alternatives themselves would have significant environmental impacts, the EIR must identify them.

Finally, the CEQA Guidelines require each EIR to identify the environmentally superior alternative among the alternatives analyzed. If the No Project Alternative is the most environmentally superior alternative, the EIR must then identify another of the alternatives as “environmentally superior.”

Alternatives Screening

EIR SCOPING

As required by CEQA, CCTA sent a copy of the NOP to the State Clearinghouse within the California Office of Planning and Research on May 16, 2008. The NOP elicited four responses that were considered in determining which alternatives this EIR analyzed. In addition, a public scoping meeting was held on May 30, 2008, at the Authority offices in Pleasant Hill, California to solicit comments on the EIR. The following is a summary of comments regarding alternatives and information on why these suggestions were either included or not included for full evaluation in the EIR. The comments and scoping meeting notes are included in full in Appendices C and D.

Contra Costa Department of Conservation and Development

The Contra Costa Department of Conservation and Development requested that a green house gas alternative focus on reducing the number and length of vehicle trips to reduce GHG emissions. Specifically, the Department requested that this EIR consider:

- Amendments to the CCTA General Plan Amendment (GPA) Review Process to support GPAs within the urban limit line (ULL). Promoting GPAs within the ULL will help reduce the number and length of vehicle trips that would otherwise occur outside the ULL. Provide a program for the distribution of TLC grants that is dependent on projects demonstrating the ability to reduce vehicle trips or vehicle trip lengths.

As described in more detail below, Alternative 3, the Greenhouse Gas Reduction Alternative, is intended to assess the comparative benefits and disadvantages of going beyond the measures already in Measure J to reduce the number and length of vehicle trips. In particular, Alternative 3 assumes new pricing strategies to increase the cost of driving, which are not part of Measure J. The TLC program, which is already part of Measure J, is intended to support local development that is compact, mixed-use, pedestrian friendly, or integrated into transit networks, as well as to encourage affordable housing. Because these projects would encourage and support the use of alternatives to driving, it is expected that most projects in this category would help reduce VMT. The basic purposes of the TLC program are established in Measure J and changes to them would likely require amendment of the measure itself, which is beyond the scope of this plan.

Measure J would already penalize jurisdictions that propose urban development outside of the ULL. In addition, the mere fact that development occurs within the ULL would not necessarily result in development that is compact, mixed-use, or pedestrian- and transit-friendly and thus would not necessarily reduce the number and length of vehicle trips.

The Department also requested that the alternatives consider two additional transportation projects in East County:

- Providing four lanes on Vasco Road from SR 4 bypass to I-580 in Livermore
- Construction of SR 239, a four-lane expressway connecting SR 4 near Brentwood to the I-580/ I-205 interchange.

The draft CTP includes safety projects on Vasco Road, consistent with Measure J. The policies included in the measure encourage improvements to Vasco Road that improve safety and discourage projects that would encourage development outside the ULL. By adding capacity outside of the Urban Limit Line, the widening of Vasco Road to four lanes could be growth inducing and could increase impacts on agricultural land. In addition, the project would not help mitigate an identified impact of the project, which is the purpose of alternatives in CEQA. The construction of SR 239 is included in the proposed Project.

The remaining comments from the Department of Conservation and Development were included in the EIR, including a description of the status of the Actions Plan, and consideration of the 2004 Mitigation Monitoring Report to refine feasible mitigation measures.

East Bay Regional Park District

The East Bay Regional Parks District requested that completion of the regional trails network in Contra Costa County should be a high priority, that evaluation of commuter and other travel uses on Contra Costa County Regional Trails should be considered, that trails be viewed as a significant component of the transportation infrastructure, that bicycling and walking be considered legitimate transportation modes, and that the DEIR should address formalization of Measure J expenditures over the 25 year period to ensure non-motorized allotments of funding for construction and maintenance.

The proposed Project includes multiple trail, bicycle, and pedestrian projects, proposed at the same priority as other types of projects at the programmatic level. The proposed 2009 CTP does consider bicycling and walking as legitimate modes of transportation, with mode share for bicycles and walking increasing in project forecasts. The voters of Contra Costa approved the Expenditure Plan when they approved Measure J in 2004. The Expenditure Plan allocates expected funding from the measure to specific projects and funding categories, including several categories that will fund bicycle, pedestrian and trail projects. The Pedestrian, Bicycle and Trail Facilities program includes specific funding for the expansion and maintenance of park district trails. Changes to this document are considered outside the scope of this EIR. No adverse impacts are expected in relation to the trail system, and as such it is not evaluated in this EIR. However, bicycle and pedestrian planning is more specifically addressed in the County-wide Bike and Pedestrian Plan and will be further evaluated there.

Public Utilities Commission and Department of Transportation

The Public Utilities Commission recommended that development projects proposed near rail corridors be planned with safety in mind. Specific safety impacts and measures will be eva-

luated and applied at the project level environmental review. Requests made by the Department of Transportation are addressed in 2.1: *Transportation and Circulation*.

OTHER ALTERNATIVES CONSIDERED BUT REJECTED FROM FULL EIR ANALYSIS

An alternative initially considered by CCTA staff and the Technical Coordinating Committee (TCC) assumed a different pattern of future development in Contra Costa. The original idea for this alternative was to use the land use database built on local General Plans that ABAG has been working on. Upon subsequent research, CCTA learned that this database would require significant local review and therefore would not be ready in time for use in this EIR. While CCTA could create its own “transportation-efficient” land use database, CCTA concluded that this database would not be feasible since the Authority does not have the ability to put it into effect. Perhaps more important, determination of an appropriate, transportation-efficient land use pattern for Contra Costa would be a complex and challenging study in itself. For these reasons, CCTA concluded that this alternative is not feasible and would not be analyzed in the EIR for the 2009 CTP.

ALTERNATIVE LOCATIONS

Although CEQA suggests that alternative locations for the project be investigated, analysis of alternative locations is not feasible or appropriate for this Program EIR. The proposed Project is a set of programs for all of Contra Costa, and is designed to address the specific needs of the county, in terms of transportation planning and growth management. Moving the Project to a different location is not reasonable, and would not achieve the objectives of the proposed Project.

Alternatives Analyzed in this EIR

This EIR analyzes the No Project and three alternatives relative to the adoption of the 2009 CTP, which is the “Project” for purposes of this EIR. These alternatives were selected to provide a reasonable range of choices for consideration by the Authority, which is responsible for preparing and adopting the CTP. The alternatives look at alternative sets of projects and programs to those proposed in the 2009 CTP. These alternatives embody different ways of achieving the goals of the 2009 CTP, which are described at greater length in *Section 1.2 Project Description*. These goals are:

- Enhance the movement of people and goods on highways and arterial roads.
- Manage the impacts of growth to sustain Contra Costa’s economy and preserve its environment.
- Provide and expand safe, convenient and affordable alternatives to the single-occupant automobile.
- Maintain the transportation system.

The Alternatives evaluated in this EIR were approved by the Authority's Planning Committee on September 3, 2008. Alternatives considered in this EIR include the following:

- No Project Alternative
- Alternative 1 – Freeway Performance Initiative
- Alternative 2 – Frequent Service Transit Network
- Alternative 3 – Greenhouse Gas Reduction Alternative

Table 3.1-1 summarizes the individual projects contained within each of the alternatives. The analysis of these alternatives assumes the same forecast growth in households and jobs for the year 2030 as would occur under the proposed Project.

Table 3.1-1: Summary of Projects included in Alternatives

<i>Proposed Project</i>	<i>No Project</i>	<i>1. Freeway Performance Initiative</i>	<i>2. Frequent Service Transit Network</i>	<i>3. Greenhouse Gas Reduction Alternative</i>
Arterial and Roadway Projects	Various Projects, many not included	All projects included	All projects included	All projects included
Caldecott Tunnel Fourth Bore	Included	Included	Included	Included
Capitol Corridor Improvements including Rail Stations at Hercules and Martinez	Most elements included	All projects included	All projects included	All projects included
East County Corridor Improvements: Vasco Road, Byron Hwy, Non Freeway SR 4	Several included on Vasco Road and State Route 4/ Byron Hwy intersection	All projects included	All projects included	All projects included
East County Rail Extension (eBART)	Included	Included	Included	Included
I-680/State Route 4 Interchange	Only Phase I included	All projects/ phases included	All projects/ phases included	All projects/ phases included
I-680 Carpool Lane Gap Closure/ Transit Corridor Improvements	Some projects included	All projects included	All projects included	All projects included
I-80 Carpool Lane Extension and Interchange Improvements	Interchanges at San Pablo Dam and Central Avenue only and some HOV lanes on I-80	All projects included	All projects included	All projects included
Interchange Improvements on I-680 and State Route 242	Most projects included	All projects included	All projects included	All projects included
Other Freeway, Expressway or Interchange improvements	Only ramp improvements at Willow Pass Road	All projects included	All projects included	All projects included
Richmond Parkway	Included	Included	Included	Included
Richmond- San Rafael Bridge: Seismic Retrofit (CCC portion)	Not Included	Included	Included	Included
State Route 4 Bypass	Some sections included	All sections included	All sections included	All sections included
State Route 4 East Widening	Only from Loveridge to Somersville and Somersville to Route 160	All sections included	All sections included	All sections included

Table 3.1-1: Summary of Projects included in Alternatives

<i>Proposed Project</i>	<i>No Project</i>	<i>1. Freeway Performance Initiative</i>	<i>2. Frequent Service Transit Network</i>	<i>3. Greenhouse Gas Reduction Alternative</i>
BART Parking, Access, Improved Capacity, and Other Improvements	Countywide access improvements, vertical circulation, and safety improvements. Few projects included.	Various improvement projects	Various improvement projects	Various improvement projects
Bus Services and Improvements	WCCTA Service expansion, C3 route expansion,	Multiple services expanded	Service expanded beyond Project and alternatives 1 and 2.	Multiple services expanded
Commute Alternatives (Intermodal, park & ride, other rail or rapid transit)	Not included	Multiple improvements included	Multiple improvements included	Multiple improvements included, with an added increase in work from home
Congestion Management, Transportation Planning, Facilities & Services	Not included	Multiple improvements included	Increased congestion management on all major freeways	Multiple improvements included, with additional element of increased parking and driving costs
Express or Rapid Bus Service	Not Included	Multiple services expanded	Multiple services expanded	Multiple services expanded
I-80 Corridor Mobility Improvement Project	Only Phase I included	All phases included	All phases included	All phases included
Maintenance	Not Included	Multiple projects included	Multiple projects included	Multiple projects included
Martinez Ferry	Not Included	Included	Included	Included
Pedestrians, Bicycles and Trails	Only bicycle parking at BART Stations	Various improvement projects	Various improvement projects	Various improvement projects
Transportation for Livable Communities Project Grants	Not specifically included	Grants Included	Grants Included	Grants Included

Source: *Comprehensive Transportation Project List, Dyett & Bhatia, 2008.*

NO PROJECT ALTERNATIVE

The No Project alternative, required by CEQA, addresses the effects of not implementing the 2009 CTP. According to the CEQA Guidelines,

The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.

The No Project alternative must describe *both* the existing conditions and the conditions that are “reasonably expected to occur in the foreseeable future if the project were not approved.” In the case of a revision of an existing plan or policy, the alternative describes the continuation of the existing plan, policy or operation. Therefore, the No Project alternative for this EIR includes a set of highway, transit, local roadway, bicycle, and pedestrian projects that are in advanced planning stages and slated to go forward since they already have full funding commitments. Specifically, this alternative includes projects that are:

1. included in the adopted 2008 State Transportation Improvement Program (STIP);
2. not yet in the STIP but are specifically named projects in the Measure J Expenditure Plan;
3. included in the most recent Measure C and Measure J Strategic Plans; or
4. within Contra Costa or the Tri-Valley that have specifically committed funding.

The “specifically named” projects include the Caldecott Tunnel Fourth Bore, State Route 4 East widening, eBART to Antioch, Capitol Corridor improvements at Martinez and Hercules, and the school bus program in San Ramon Valley. The Measure J Strategic Plan includes several phases of the State Route 4 Bypass, safety improvements on Vasco Road, and improvements to several interchanges, including I-680/SR 4, I-80/Central, I-80/San Pablo Dam Road, and SR 242/Clayton Road.

ALTERNATIVE 1—FREEWAY PERFORMANCE INITIATIVE (FPI)

This alternative uses the approach that MTC used in its Vision analysis (MTC 2007). Called the “Freeway Performance Initiative” (FPI), this alternative assumes implementation of a variety of “intelligent transportation systems” (ITS) and operational improvements such as ramp metering, changeable message signs and variable speed limits. According to MTC and Caltrans, these improvements could result in an increase in freeway capacity of approximately eight percent.

The Project Alternative already includes ITS on the I-80 corridor in West Contra Costa County through the Integrated Corridor Management (ICM) Project on that route. This alternative assumes implementation of an ICM project on all freeways within Contra Costa. The FPI alternative is modeled by increasing hourly freeway capacity on all freeways within Contra

Costa by eight percent. This theoretical increase in freeway capacity only has a beneficial impact on freeway segments that are at or above capacity.

ALTERNATIVE 2—FREQUENT SERVICE TRANSIT NETWORK

This alternative uses the Frequent Service Transit Network (FSTN) that MTC developed in consultation with transit agency staff throughout the region. The FSTN focuses on an expanded HOV lane network and enhanced express bus service in the region.

Generally speaking, in addition to increasing transit frequency, this alternative would add HOV lanes, based on MTC's HOV Master Plan (MTC 2002). MTC is also proposing a HOT lane network, where SOVs could use the HOV lanes by paying a toll. Tolls for lanes would increase over time and would vary with congestion levels. The viability of HOT lanes is currently being analyzed by MTC. Because operating strategies will vary by time-of-day, roadway location and qualifying minimum occupancy of 2 or 3 persons, the proposal for HOT lanes is not analyzed here.

To increase the attractiveness of transit service, this alternative incorporates a Frequent Transit Service network in the travel model for analysis in this EIR. To do this, some transit routes in countywide model (which contains fixed-route transit routes and headways) were given more frequent day-long headway of 15 minutes. While the actual routes in such a program may vary, this provides a tool by which to simulate the effects of running buses more frequently. Those routes assumed with enhanced day-long frequencies were County Connection Routes 107, 116, 121 and 115, as well as Tri-Delta Transit Route 391. Another key route, AC Transit Route 72R, was already operating at a headway of less than 15 minutes. Furthermore, this alternative adds HOV lanes on I-80, I-680, and SR4.

ALTERNATIVE 3—GREENHOUSE GAS REDUCTION ALTERNATIVE

This alternative incorporates measures to limit conditions that increase emissions of greenhouse gases (GHG) such as carbon dioxide (CO₂) and methane. In June 2008, the Office of Planning and Research (OPR) released a "technical advisory" on CEQA and climate change. The advisory notes that:

Lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source [and] must assess whether those emissions are individually or cumulatively significant. . . . If the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

The California Attorney General's (AG) office has identified measures that lead agencies can take to reduce greenhouse emissions.¹ A subset of those measures applies to transportation projects. Several of the transportation measures identified by the Attorney General's Office are already part of the Measure J Expenditure Plan, including funding intermodal stations, supporting school bus programs, funding bicycle and pedestrian facilities, and providing TDM support through the 511 Contra Costa program. Many of the Attorney General's additional measures fall outside the scope of the 2009 CTP, however, either because they would apply to a more detailed level of design or would apply to different aspects of the environment, such as land use or water conservation, over which the Authority does not have control.

There are, however, a few additional measures that could apply to the 2009 CTP. One measure that is applicable — to “increase the cost of driving and parking private vehicles by, e.g., imposing tolls and parking fees” — forms the basis for this alternative. It is reflected in the Countywide Model by assuming higher parking costs in several commercial districts in the county. Specifically, these were added in the “downtown” sections of Richmond, El Cerrito, Walnut Creek, Concord, Pleasant Hill, Martinez, Pittsburg and Antioch. Another AG-suggested measure, an increase in tele-work, was reflected in the modeling for upper income workers and their response to forecast congestion, higher driving costs and improved communications technology. The Countywide Model contains four home-to-work trip purpose tables, which are stratified by household income. A reduction of seven percent was applied to the top two income category tables.

This approach is also consistent with the suggestions outlined in the recent update to the CTC's regional transportation guidelines, which were amended to address SB 375 and AB 32.² Suggestions made by the CTC, in addition to pricing, are already included in the 2009 CTP Project network, such as shifting more investment towards alternative modes, implementing operational efficiencies that reduce congestion, and including land-use requirements and performance measures (as found in the Measure J Growth Management Program and Action Plan framework).

Under this alternative, CCTA would also incorporate additional measures, based on the Attorney General's comments on RTPs, Draft EIRs on RTPs, and on General Plan policies related to GHGs and climate change. These measures include the following types of actions or commitments:

- Require the preparation of RTPC Climate Action Plans (the West County Action Plan already includes this commitment).

¹ The Attorney General published a document *The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level*, updated May 21, 2008 and available at <http://ag.ca.gov/globalwarming/ceqa.php>

² The California Transportation Commission adopted *Addendum to the 2007 Regional Transportation Plan Guidelines: Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process* on May 29, 2008.

- Offer voluntary incentives (or funding priorities) for projects or programs that include a component for reducing GHG emissions. This might include incentives for replacement buses that are hybrid electric or maybe even buses with hydrogen fuel cells.
- Adopt “green construction” policies and practices for Measure J funded work, modeled on the State’s requirements. These might include requirements for use of the lowest emitting construction equipment and fuels (e.g. diesel-powered vehicles with EPA Tier 3 or better engines or retrofitting to meet equivalent emission standards as Tier 3 engines).
- Promote use of light colored pavement for solar reflectivity and reduced heat island effects.
- Require shade tree planting as part of specified types of 2009 CTP construction projects or wherever Measure J-funded construction results in loss of tree cover (trees have a temporary carbon sequestration capacity depending on the life of the tree).
- Establish minimum standards for Measure J-funded or Authority-supported construction management, including specifying minimum content for recycled products in aggregate, concrete, etc. and construction waste management.³

Comparative Impact Analysis

This section compares the environmental impacts of each alternative to the proposed Project, by resource issue area. Alternatives 1 through 3 are expected to share the same network with the Project, differing in terms of freeway capacity, transit frequencies, rates of telecommuting, and costs of parking and driving. Increased freeway capacity would result from operational changes like ramp metering, changeable message signs, and variable speed limits rather than from expansion. The No Project includes a more limited network, though the network includes many of the major projects included in the proposed Project. Note that future project-level analysis would determine the actual significance level of the impacts described below, as well as the level of mitigation required.

TRANSPORTATION AND CIRCULATION

All future conditions reflect the cumulative impact of population growth and land use changes that will lead to increased use of the transportation system. Overall, the measurable differences in transportation performance among the Alternatives are not large. VMT and total vehicle trips, for example, remain essentially unchanged between the proposed Project and Alternatives 1, 2 and 3. In addition, transit ridership and transit mode share increase slightly or stay essentially the same between alternatives. This is perhaps not surprising given that all alterna-

³ In a May 2007 letter, the AG mentioned the value of “warm mix” asphalt to reduce GHG emissions as a feasible alternative paving material, Alameda County also mentioned the value of requiring use of fly ash in concrete.

tives share the same basic network of projects, as well as the existing system. Alternatives 1, 2 and 3 do, however, differ from existing conditions and the No Project Alternative in VMT, VHT, and Average Speed, as shown in Tables 3.1-2, 3.1-3 and 3.1-4.

The Greenhouse Gas Reduction Alternative results in the most beneficial environmental outcome, as reflected in lowest daily VHT, lowest peak hour VMT for both AM and PM peak periods (although with relatively higher levels of travel at LOS F), the lowest total daily vehicle trips, and comparable outcomes to the Project and Alternatives 1 and 2 for other indicators. The No Project Alternative would result in the longest travel times, highest peak hour VHT, and decreased average speed compared to the Project and Alternatives 1, 2 and 3.

Vehicle Miles Traveled

As shown in Table 3.1-2, the adoption and implementation of the Project or any of the three proposed Alternatives would decrease VMT at Level of Service F during peak hours significantly when compared to the No Project alternative (around 20 percent in both peak hours), as several of the new projects are intended to ease congestion at the most congested locations around Contra Costa. A beneficial impact in regard to VMT during peak hours is anticipated with all three alternatives. These improvements over the No Project alternative indicate that while the overall increase in VMT is cumulatively significant, none of the Alternatives contribute significantly to the impact.

Vehicle Hours Traveled

According to this forecast, overall VHT for all three alternatives and the Project will be lower when compared to the No Project alternative. Overall, the Project, Alternative 1 and Alternative 2 would each result in a reduction of around six percent in total daily VHT, with more substantial decreases for the peak hours. Alternative 3 would result in a reduction of around seven percent in total daily VHT, also with more substantial decreases for the peak hours. The VHT by facility type and level-of-service results for the AM peak hour, the PM peak hour and daily conditions are shown in Table 3.1-3. All three proposed Alternatives would reduce the aggregate vehicle hours traveled compared to the No Project alternative, with the most beneficial impact anticipated from Alternative 3, though only by a less than significant amount. Alternative 1 reflects the best results during peak hours, though not by a significant amount. These improvements over the No Project alternative indicate that while the overall increase in VHT is cumulatively significant, none of the Alternatives contribute significantly to the impact.

Table 3.1-2: Peak Hour Vehicle Miles of Travel at Level of Service F for Roadway Segments

Scenarios	Facility Type	Vehicle Miles of Travel at Level of Service F		Vehicle Miles of Travel	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
EXISTING CONDITIONS	Collector	7,368	910	138,207	165,130
	Expressway / Major Arterial	33,207	20,561	437,796	509,262
	Freeway	95,144	35,355	900,732	952,875
	Other	8,359	2,517	141,694	174,701
	Total	144,079	59,343	1,618,430	1,801,968
2030 NO PROJECT	Collector	70,220	63,620	287,525	320,684
	Expressway / Major Arterial	164,213	132,006	759,911	844,797
	Freeway	461,035	486,181	1,236,924	1,290,308
	Other	29,629	33,482	223,556	259,762
	Total	725,096	715,289	2,507,916	2,715,551
2030 PROJECT	Collector	29,968	42,072	255,150	287,816
	Expressway / Major Arterial	114,317	103,513	760,614	854,639
	Freeway	389,622	414,453	1,238,215	1,300,621
	Other	24,122	25,474	212,848	249,169
	Total	558,028	585,513	2,466,827	2,692,246
2030 ALTERNATIVE 1 FREEWAY PERFORMANCE INITIATIVE	Collector	27,622	38,833	250,804	281,965
	Expressway / Major Arterial	113,520	97,486	751,886	844,991
	Freeway	392,475	394,719	1,258,247	1,323,633
	Other	21,466	23,399	211,059	247,048
	Total	555,083	554,437	2,471,996	2,697,637
2030 ALTERNATIVE 2 FREQUENT TRANSIT SERVICE NETWORK	Collector	31,545	42,273	254,797	286,636
	Expressway / Major Arterial	116,008	103,528	760,621	855,984
	Freeway	414,376	414,185	1,236,721	1,299,464
	Other	23,806	25,246	211,807	249,113
	Total	585,736	585,232	2,463,946	2,691,197
2030 ALTERNATIVE 3 GREENHOUSE GAS REDUCTION	Collector	31,805	39,629	252,996	285,229
	Expressway / Major Arterial	123,237	100,432	759,111	856,094
	Freeway	394,425	417,342	1,235,051	1,299,318
	Other	24,179	25,056	211,966	248,056
	Total	573,646	582,458	2,459,125	2,688,696

Source: DKS Associates, 2008. "Other" includes primary approaches to toll plazas and HOV lane connectors.

Table 3.1-3: Daily Vehicle Hours of Travel for Roadway Segments

Scenarios	Facility Type	Vehicle Hours of Travel		
		AM Peak Hour	PM Peak Hour	Daily
EXISTING CONDITIONS	Collector	4,241	5,132	45,021
	Expressway / Major Arterial	12,467	14,890	131,068
	Freeway	20,528	22,879	228,810
	Other	5,923	7,016	73,455
	Total	43,159	49,917	478,355
2030 NO PROJECT	Collector	17,502	16,036	96,075
	Expressway / Major Arterial	35,844	33,108	231,095
	Freeway	58,199	54,090	435,298
	Other	12,057	12,256	108,222
	Total	123,601	115,490	870,690
2030 PROJECT	Collector	11,301	12,086	78,569
	Expressway / Major Arterial	28,713	29,456	224,138
	Freeway	46,420	46,968	407,772
	Other	10,450	11,087	103,990
	Total	96,885	99,597	814,469
2030 ALTERNATIVE 1 FREEWAY PERFORMANCE INITIATIVE	Collector	10,949	11,582	77,574
	Expressway / Major Arterial	27,654	28,651	224,725
	Freeway	45,816	46,597	408,090
	Other	10,291	10,948	104,516
	Total	94,710	97,778	814,906
2030 ALTERNATIVE 2 FREQUENT TRANSIT SERVICE NETWORK	Collector	11,393	12,240	78,635
	Expressway / Major Arterial	28,730	29,409	223,244
	Freeway	46,039	46,560	407,598
	Other	10,417	11,110	105,102
	Total	96,578	99,319	814,579
2030 ALTERNATIVE 3 GREENHOUSE GAS REDUCTION	Collector	11,022	11,851	77,180
	Expressway / Major Arterial	28,598	29,288	223,549
	Freeway	45,907	46,725	407,261
	Other	10,511	11,043	103,508
	Total	96,038	98,907	811,497

Source: DKS Associates, 2008. "Other" includes primary approaches to toll plazas and HOV lane connectors

Average Speed

Similar to vehicle hours traveled, average speeds are an indicator of the congestion in a network. Table 3.1-4 lists the average speed on roads within Contra Costa by Facility Type for all three alternatives. As these data show, the average peak hour speed is expected to decrease in

2030 when compared to existing conditions, no matter what condition is projected, with improvements in travel speeds demonstrated when comparing the Project and all three Alternatives to the No Project alternative in 2030. These improvements over the No Project alternative indicate that while the overall decrease in average speed is cumulatively significant, none of the Alternatives contribute significantly to the impact.

Table 3.1-4: Average Speed by Facility Type for Roadway Segments

Scenarios	Facility Type	Average Speed (miles per hour)		
		AM Peak Hour	PM Peak Hour	Daily
EXISTING CONDITIONS	Collector	32.6	32.2	33.9
	Expressway / Major Arterial	35.1	34.2	37.8
	Freeway	43.9	41.6	52.4
	Other	23.9	24.9	24.7
	Total	37.5	36.1	42.4
2030 NO PROJECT	Collector	16.4	20.0	27.5
	Expressway / Major Arterial	21.2	25.5	33.5
	Freeway	21.3	23.9	38.5
	Other	18.5	21.2	23.8
	Total	20.3	23.5	34.1
2030 PROJECT	Collector	22.6	23.8	30.3
	Expressway / Major Arterial	26.5	29.0	35.6
	Freeway	26.7	27.7	41.7
	Other	20.4	22.5	24.2
	Total	25.5	27.0	36.7
2030 ALTERNATIVE 1 FREEWAY PERFORMANCE INITIATIVE	Collector	22.9	24.3	30.6
	Expressway / Major Arterial	27.2	29.5	35.5
	Freeway	27.5	28.4	41.7
	Other	20.5	22.6	24.1
	Total	26.1	27.6	36.7
2030 ALTERNATIVE 2 FREQUENT TRANSIT SERVICE NETWORK	Collector	22.4	23.4	30.3
	Expressway / Major Arterial	26.5	29.1	35.7
	Freeway	26.9	27.9	41.7
	Other	20.3	22.4	23.9
	Total	25.5	27.1	36.6
2030 ALTERNATIVE 3 GREENHOUSE GAS REDUCTION	Collector	23.0	24.1	30.7
	Expressway / Major Arterial	26.5	29.2	35.6
	Freeway	26.9	27.8	41.7
	Other	20.2	22.5	24.2
	Total	25.6	27.2	36.7

Source: DKS Associates, 2008. "Other" includes primary approaches to toll plazas and HOV lane connectors.

Total Vehicle Trips

This analysis evaluates the change in total vehicle trips (traffic) and changes in the amount of travel at different levels-of-service on freeways and local streets (congestion). Overall, the number of vehicle trips generated within Contra Costa is anticipated to grow by 25 percent between 2007 Existing Conditions and 2030 No Project alternative. Table 3.1-5 lists the vehicle trips for each of the alternatives. When compared to the 2030 No Project, there is a slight decrease in number of vehicle trips for the Project and all three Alternatives. Even so, the projected change is less than one percent of the total number of vehicle trips within, into or out of Contra Costa for the Project and Alternatives 1 and 2, and less than two percent for Alternative 3, making the difference less than significant for any of the alternatives. These improvements over the No Project alternative indicate that while the overall increase in total vehicle trips is cumulatively significant, none of the Alternatives contribute significantly to the impact.

Table 3.1-5: Total Daily Vehicle Trips

<i>Alternative</i>	<i>Daily Vehicle Trips</i>	<i>% Change compared to Existing Conditions</i>	<i>% Change compared to 2030 No Project</i>
Existing Conditions	2,398,890	—	—
2030 No Project	3,008,101	25.4%	—
2030 Project	2,995,938	24.9%	-0.4%
2030 Alternative 1 Freeway Performance Initiative	2,995,929	24.9%	-0.4%
2030 Alternative 2 Frequent Transit Service Network	2,993,833	24.8%	-0.6%
2030 Alternative 3 Greenhouse Gas Reduction	2,969,588	23.8%	-1.6%

Source: DKS Associates, 2008.

Transit Trips

As detailed in Table 3.1-6, under Alternative 1 there would be a 79 percent increase in transit activity over existing conditions, under alternative 2 there would be a 84 percent increase in transit activity, and under alternative 3 there would be a 85 percent increase. Alternatives 2 and 3 see slightly more transit ridership than the Project and Alternative 1, under which there will be nearly 64,500 additional transit trips in the county when compared to the No Project condition, reflecting a 21 percent increase. This proportion is considered beneficial. It should be noted that eBART is assumed in all alternatives.

Table 3.1-6: Transit Activity in Contra Costa (both boardings and alightings)

	Operator			TOTAL
	AMTRAK	BART / eBART	BUS: Local and Express	
Existing Conditions	900	63600	143500	208000
No Project	1600	99600	205800	307000
Project				
Boardings and Alightings	1400	99500	270600	371500
Change from Existing Conditions	56%	56%	89%	79%
Change from No Project	-13%	0%	31%	21%
Alt 1: Freeway Performance				
Boardings and Alightings	1500	99500	270500	371500
Change from Existing Conditions	67%	56%	89%	79%
Change from No Project	-6%	0%	31%	21%
Alt 2: Frequent Transit Service Network				
Boardings and Alightings	1400	99100	282200	382700
Change from Existing Conditions	56%	56%	97%	84%
Change from No Project	-13%	-1%	37%	25%
Alt. 3: Greenhouse Gas Reduction				
Boardings and Alightings	1500	101200	281900	384600
Change from Existing Conditions	67%	59%	96%	85%
Change from No Project	-6%	2%	37%	25%

Source: DKS Associates, 2008.

Table 3.1-7: Mode Shares (Daily)¹

	Existing Conditions		2030 No Project		2030 Project		2030 Alternative 1 Freeway Performance Initiative		2030 Alternative 2 Frequent Transit Service Network		2030 Alternative 3 Greenhouse Gas Reduction	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
<i>All Trip Purposes</i>												
Drive Alone	1,296,700	38.4%	1,690,000	39.5%	1,680,439	39.3%	1,680,000	39.3%	1,679,000	39.3%	1,673,000	39.1%
Shared Ride 2+	448,850	13.3%	565,000	13.2%	560,620	13.1%	561,000	13.1%	560,000	13.1%	559,000	13.1%
Shared Ride 3+	293,500	8.7%	351,000	8.2%	350,205	8.2%	350,000	8.2%	350,000	8.2%	349,000	8.2%
Vehicle Driver I	871,800	25.8%	1,042,000	24.4%	1,040,337	24.3%	1,040,000	24.3%	1,040,000	24.3%	1,023,000	23.9%
Vehicle Passenger I	183,250	5.4%	235,000	5.5%	234,962	5.5%	235,000	5.5%	235,000	5.5%	230,000	5.4%
Transit	104,500	3.1%	162,000	3.8%	179,505	4.2%	180,000	4.2%	183,000	4.3%	185,000	4.3%
Bicycle	17,550	0.5%	21,000	0.5%	20,496	0.5%	20,000	0.5%	20,000	0.5%	22,000	0.5%
Walk	160,550	4.8%	210,000	4.9%	210,200	4.9%	210,000	4.9%	210,000	4.9%	237,000	5.5%
Total	3,376,700	100.0%	4,277,000	100.0%	4,276,765	100.0%	4,277,000	100.0%	4,277,000	100.0%	4,277,000	100.0%

¹ Non-home-based and home-to-school trips are divided into Vehicle Driver and Vehicle Passenger trips. Non-home-based trips include trips by commercial vehicles and errands made from work. Home-to-school trips are divided into three categories: trips to grade school, trips to high school and middle school, and trips to college. Vehicle Driver trips do not include drivers of vehicles making trips to grade school, which are typically included as a home-based shop/other shared ride 2 or shared ride 3+ trips.

Source: DKS Associates, 2008.

Mode share

Mode share is calculated at the trip purpose level. As an aggregate measure, all trip purposes are added together to obtain overall mode shares throughout the county. Table 3.1-7 lists the mode shares for trips that start or end within the county. Transit mode share increases in the Project and all three Alternatives when compared to existing conditions and the No Project alternative. For all three alternatives the changes in the transit mode share are minimal but would have a beneficial impact on the transportation system in Contra Costa.

AIR QUALITY

Emissions were estimated for the alternatives for the year 2030 using the same methodology as outlined in Section 2.2 *Air Quality*. Estimated daily emissions of criteria pollutants for the proposed Project and Alternatives for the year 2030 are shown in Table 3.1-8 along with estimated emissions for existing conditions. The table also presents the percent change between each alternative and existing 2007 conditions, proposed Project conditions, and No Project conditions.

As shown in Table 3.1-8, emissions associated with Alternative 1 for all criteria pollutants would be approximately 0.01 percent lower than emissions anticipated under implementation of the proposed Project. As with the proposed Project, Alternative 1 would result in a net decrease in emissions of ROG, NO_x and CO from existing 2007 conditions. Because the decline in emissions is regional and attributable to improvements in technology and successful regulation rather than the impacts of Alternative 1, Alternative 1 has no impact emissions of ROG, NO_x and CO. As with the proposed Project, Alternative 1 would result in an overall increase in PM-10 and PM-2.5 emissions. Nevertheless, similar to the proposed Project, PM-10 and PM-2.5 emissions associated with Alternative 1 would be less than those anticipated under the No Project conditions, and therefore the contribution from implementation of Alternative 1 to cumulative PM-10 and PM-2.5 levels would be less than significant.

Alternative 2 would result in slightly higher daily emissions of ROG and NO_x than the proposed Project. Nevertheless, as shown in Table 3.1-8, Alternative 2 would result in a net decrease in emissions of ROG, NO_x and CO from existing 2007 conditions. Because the decline in emissions is regional and attributable to improvements in technology and successful regulation rather than the impacts of Alternative 2, Alternative 2 has no impact on emissions of ROG, NO_x and CO. While Alternative 2 would result in lower PM-10 and PM-2.5 emissions than the proposed Project, cumulative impacts would be potentially significant. When compared to future No Project conditions, Alternative 2 would result in a net decrease in PM-10 and PM-2.5 emissions; therefore, the contribution from implementation of Alternative 2 to cumulative impacts would be less than significant.

Table 3.1-8: Estimated Transit and Non-Transit Emissions for Proposed Project and Alternatives (2030) – tons per day

	<i>Reactive Organic Gases</i>	<i>Nitrogen Oxides</i>	<i>Carbon Monoxide</i>	<i>Particulate Matter PM- 10</i>	<i>Particulate Matter PM- 2.5</i>
Existing Conditions (2007)					
Non-Transit Emissions	3.58	22.17	85.61	1.02	0.66
Bus Transit Emissions	0.02	0.64	0.12	0.01	0.01
eBART Emissions	0.00	0.00	0.00	0.00	0.00
Commuter Rail Emissions	0.10	1.85	0.28	0.07	0.06
Total Emissions	3.71	24.65	86.00	1.09	0.73
No Project (2030)					
Non-Transit Emissions	1.11	5.77	30.39	1.290	0.766
Bus Transit Emissions	0.03	0.63	0.17	0.011	0.009
eBART Emissions	0.01	0.01	0.09	0.000	0.000
Commuter Rail Emissions	0.00	0.00	0.00	0.000	0.000
Total Emissions	1.15	6.398	30.64	1.302	0.776
Change 2007 to 2030 No Project	-69.1%	-74.0%	-64.4%	-19.1%	6.6%
Proposed Project (2030)					
Non-Transit Emissions	1.09	5.73	29.54	1.232	0.74
Bus Transit Emissions	0.03	0.63	0.15	0.010	0.01
eBART Emissions	0.01	0.01	0.09	0.000	0.00
Commuter Rail Emissions	0.00	0.00	0.00	0.000	0.00
Total Emissions	1.12	6.37	29.79	1.243	0.75
Change 2007 to Project	-69.9	-74.2%	-65.4%	13.7%	3.0%
Change No Project to Project	-2.5%	-0.4%	-2.8%	-4.5%	-3.8%
Alternative 1: Freeway Performance Initiative (2030)					
Non-Transit Emissions	1.09	5.73	29.54	1.232	0.74
Bus Transit Emissions	0.03	0.63	0.15	0.010	0.01
eBART Emissions	0.01	0.01	0.09	0.000	0.00
Commuter Rail Emissions	0.00	0.00	0.00	0.000	0.00
Total Emissions	1.12	6.38	29.78	1.242	0.75
Change 2007 to 2030 Alternative 1	-69.9%	-74.2%	-65.4%	13.7%	2.5%
Change No Project to Alternative 1	-2.5%	-0.4%	-2.8%	-4.5%	-3.8%
Change Project to Alternative 1	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
Alternative 2: Frequent Transit Service Network (2030)					
Non-Transit Emissions	1.09	5.73	29.51	1.231	0.74
Bus Transit Emissions	0.03	0.66	0.16	0.011	0.01
eBART Emissions	0.01	0.01	0.09	0.000	0.00
Commuter Rail Emissions	0.00	0.00	0.00	0.00	0.00

Table 3.1-8: Estimated Transit and Non-Transit Emissions for Proposed Project and Alternatives (2030) – tons per day

	Reactive Organic Gases	Nitrogen Oxides	Carbon Monoxide	Particulate Matter PM- 10	Particulate Matter PM- 2.5
Total Emissions	1.12	6.40	29.76	1.24	0.75
Change 2007 to 2030 Alternative 2	-69.9%	-74.1%	-65.4%	13.7%	2.5%
Change No Project to Alternative 2	-2.5%	-0.1%	-2.9%	-4.6%	-3.8%
Change Project to Alternative 2	0.01%	0.37%	-0.08%	-0.06%	-0.05%
Alternative 3: Greenhouse Gas Reduction (2030)					
Non-Transit Emissions	1.09	5.72	29.48	1.23	0.74
Bus Transit Emissions	0.03	0.63	0.15	0.01	0.01
eBART Emissions	0.01	0.01	0.09	0.00	0.00
Commuter Rail Emissions	0.00	0.00	0.00	0.00	0.00
Total Emissions	1.12	6.36	29.72	1.24	0.75
Change 2007 to 2030 Alternative 3	-69.9%	-74.2%	-65.4%	13.5%	2.3%
Change No Project to Alternative 3	-2.7%	-0.6%	-3.0%	-4.7%	-3.9%
Change Project to Alternative 3	-0.21%	-0.19%	-0.21%	-0.21%	-0.21%

Note: These estimates were prepared using EMFAC2007 emissions factors and the results of transportation modeling by DKS Associates. EMFAC2007 factors reflect average speeds of 34 mph for the No Project Alternative conditions and 37 mph for proposed Project and Alternatives 1, 2 and 3 conditions based on the projected level of congestion. The factors assume the default temperature profile for Contra Costa County and Contra Costa County vehicle mixes in 2030 based on fleet mix information included in EMFAC2007. Data used from the transportation modeling include average speeds and daily VMT for transit and non-transit activity. PM-10 and PM-2.5 includes exhaust particulates, tire wear, brake wear, and 0.0014 grams per mile in entrained road dust.

Source: *Environmental Science Associates, 2008.*

Alternative 3 would result in the lowest emission rates of any of the future 2030 scenarios. As with the proposed Project, Alternative 1 would result in a net decrease in emissions of ROG, NO_x and CO from existing 2007 conditions. Because the decline in emissions is regional and attributable to improvements in technology and successful regulation rather than the impacts of Alternative 3, Alternative 3 has no adverse impact emissions of ROG, NO_x and CO. While Alternative 3 would result in lower emissions of PM-10 and PM-2.5 than the proposed Project, cumulative impacts would be potentially significant. However, when compared to the No Project conditions, Alternative 3 would result in approximately 4.7 percent less PM-10 emissions and approximately 3.9 percent less PM-2.5 emissions. Therefore, the contribution from implementation of Alternative 3 to cumulative PM-10 and PM-2.5 impacts would be less than significant.

Note that eBART activity would remain the same in the three alternatives and the No Project Alternative. Also, it was assumed that all commuter rail transit would utilize electricity by 2030; therefore it was assumed that no direct emissions would occur from these activities.

In addition to criteria pollutant emissions, Diesel Particulate Matter emissions were estimated for the alternatives for the year 2030 using the same methodology as outlined in Section

2.2, Air Quality. Estimated daily DPM emissions in pounds per day for existing 2007 conditions and future 2030 emissions from the proposed Project and Alternatives are presented in Table 3.1-9. The percent change from existing, No Project, and proposed Project conditions is also presented for each of the alternatives.

As shown in Table 3.1-9, DPM emissions associated with Alternatives 1 and 3 would be lower than those anticipated from the Proposed Project. Therefore, as with the proposed Project, impacts associated with these alternatives would be less than significant. Alternative 2 would result in approximately 0.52 percent more DPM emission than the proposed Project. Nevertheless, this alternative would still result in a net decrease of approximately 74.2 percent from existing 2007 DPM emissions.

Table 3.1-9: Estimated Transit and Non-Transit Diesel Particulate Matter Emissions for Proposed Project and Alternatives(2030)

	<i>DPM Emissions (Pounds Per Day)</i>	<i>Change from Existing</i>	<i>Change from No Project</i>	<i>Change from Project</i>
Existing (2007)	458.92	—	—	—
No Project (2030)	121.64	-73.49%	—	—
Proposed Project (2030)	117.78	-74.34%	-3.18%	—
Alternative 1: Freeway Performance Initiative (2030)	117.77	-74.34%	-3.19%	-0.01%
Alternative 2 Frequent Transit Service Network (2030)	118.39	-74.20%	-2.68%	0.52%
Alternative 3 Greenhouse Gas Reduction (2030)	117.56	-74.38%	-3.35%	-0.18%

Source: *Environmental Science Associates, 2008.*

ENERGY

As shown in Table 3.1-10, the 2009 CTP as well as Alternatives 1, 2, and 3 would all result in slightly less direct energy use than the No Project, slightly more indirect energy use than the No Project, and slightly more total energy use than the No Project. The difference between the Project and No Project is 2.3 billion BTUs.

The proposed Project, the No Project, and Alternatives 1, 2, and 3 would all result in a decrease in per capita energy use when compared with existing conditions. The No Project would result in the largest decline—6.9 percent, due to the fact that the No Project includes the least construction and thus the lowest indirect energy use, while still seeing some benefit of increased fuel efficiency. The Greenhouse Gas Reduction Alternative would result in the second largest decline of 6.1 percent, primarily because average speeds are highest in this Alternative, resulting in lower direct emissions.

Table 3.1-10: Energy Use by Alternative

	<i>Direct Energy Total (Billion BTUs/ Day)</i>	<i>Indirect Energy Total (Billion BTUs/ Day)</i>	<i>Total Daily Energy (Billion BTUs/ Day)</i>	<i>Per Capita Daily Energy (BTUs)</i>
Existing Conditions	149.2	59.6	208.9	202,159
No Project	143.7	88.6	232.3	188,234
Change from existing conditions to No Project	-3.7%	48.6%	11.2%	-6.9%
Project	142.5	92.0	234.6	190,081
Change from existing conditions to Project	-4.5%	54.3%	12.3%	-6.0%
2030 Alternative 1 Freeway Performance Initiative	142.6	92.0	234.6	190,074
Change from existing conditions to Alternative 1	-4.5%	54.3%	12.3%	-6.0%
2030 Alternative 2 Frequent Transit Service Network	142.5	92.0	234.5	190,051
Change from existing conditions to Alternative 2	-4.5%	54.3%	12.3%	-6.0
2030 Alternative 3 Greenhouse Gas Reduction	142.4	91.8	234.3	189,834
Change from existing conditions to Alternative 3	-4.6%	54.0%	12.2%	-6.1%

Source: Dyett and Bhatia, 2008

The decrease in direct energy use for the Project and three Alternatives when compared to the No Project is due primarily to forecast increases in average travel speed in the network. Decreases in direct energy use when compared to existing conditions are largely due to improvements in fuel efficiency. The increase in indirect energy use for the Project and the three Alternatives is due to increased construction and increased daily vehicle miles traveled. Second to the No Project, the Greenhouse Gas Reduction Alternative uses 0.3 billion BTU less than the Project (technically the highest energy use alternative). Given these indicators, the Greenhouse Gas Reduction Alternative is preferred by a small margin.

GEOLOGY AND SEISMICITY

Specific projects proposed in the Project, No Project, and three alternatives were analyzed collectively, as potential geologic impacts among the alternatives are similar.

The most significant geologic impacts would be those resulting from the continued exposure of people to earthquake-related geologic hazards. The population of the Bay Area is expected to grow substantially over the next two decades, bringing more people into Contra Cos-

ta to work, live, and for entertainment, with or without any transportation improvements, increasing the risks of injuries and loss of life in a major earthquake.

The No Project Alternative would result in fewer impacts related to Geology, Soils and Seismicity compared to the Project and other alternatives. In addition, many of the projects in the No Project have previously been evaluated in the CTP 2004 Update EIR. Significant but mitigable impacts would occur under the No Project Alternative and the proposed Project, resulting from the construction of new or expanded transportation networks. When compared to the No Project Alternative, impacts related to Geology, Soils, and Seismicity would likely be greater under the proposed Project due to the increased number of transportation network expansion projects, but still mitigable. Alternatives 1 through 3 are expected to cause similar impacts to the proposed Project.

BIOLOGICAL RESOURCES

Biological resource impacts would occur under the proposed Project and all alternatives, resulting from the construction of new or expanded transportation networks. The No Project Alternative would result in comparatively fewer biological resource impacts when compared to the Project and three other alternatives, due to the smaller number of transportation network expansion projects. The impacts discussed in Section 2.5 would occur under all alternatives, since all alternatives would result in new development. All alternatives have the potential to impact special-status species, and all projects would require project-level analysis and would be subject to wetland and endangered species regulations. Impacts under Alternatives 1 through 3 would be similar to the proposed Project.

HYDROLOGY AND WATER RESOURCES

Impacts on hydrology and water resources could result from an increase in impervious surfaces; stormwater runoff through construction activities; and an increase in pollutant levels in stormwater runoff generated from vehicles.

Overall, the construction of additional transportation facilities associated with the Project and three alternatives, and to a lesser extent with the No Project Alternative, would have the potential to result in a degradation of water quality. Additionally, increased vehicle usage associated with projected population increases in the Bay Area would result in a cumulative degradation of water quality.

Because the No Project Alternative would result in fewer construction projects, it would likely create fewer impacts related to hydrology resources compared to the Project and three other alternatives.

VISUAL RESOURCES

Short-term visual resources impacts could result from blocking or disrupting sensitive views through the construction of transportation projects. Long-term impacts could result by adding incongruous elements to the County's existing landscape that would block views or alter – the

existing scale, character, and quality of – rural or open space areas, important vistas along roadways, and urban communities.

The 2009 CTP contains some new projects with potentially significant visual impacts on scenic resources and thus would have a greater visual impact compared to the No Project Alternative. However, all the major projects with visual impacts listed in Section 2.7 Table 2.7-1, with the exception of the Martinez Ferry landside improvements, are included in the No Project. Likewise, the Freeway Performance Initiative Alternative, which would assume implementation of an ICM project on all freeways in Contra Costa County, could result in additional signage on Designated Scenic Highways 680 and 24, and Eligible Scenic Highway 4, and therefore would have a greater visual impact compared to the proposed Project.

The Frequent Service Transit Network Alternative and Greenhouse Gas Reduction Alternative focus mostly on operations and would not include construction in addition to that in the proposed Project. Both of these Alternatives would not significantly change the physical configuration of existing transportation facilities and are unlikely to have effects on views that differ from the Project impacts.

The Freeway Performance Initiative Alternative has slightly more visual impacts than the other alternatives given the potential impact on scenic highways. The No Project Alternative would have the smallest impact on visual resources since fewer projects are completed.

NOISE

Short-term noise impacts would result from the construction of transportation improvements under all four alternatives. Noise impacts would also result if transportation improvements would cause noise levels to approach or exceed FHWA and FTA Noise Abatement Criteria. Due to the local nature of noise, without project-level analysis, the full impact cannot be determined. The following analysis qualitatively compares noise impacts from each of the Alternatives.

Because only funded projects would be constructed under the No Project Alternative, noise from construction would be less than for the proposed Project and Alternatives 1 through 3. Construction activities under all three Alternatives would be similar to the proposed Project.

Alternatives 1 through 3 would have similar impacts on noise when compared to the proposed Project, with some distinctions. For instance, Alternative 2 would result in more noise related to transit use in terms of increased bus frequency. This impact would be focused along transit routes and would likely reduce noise impacts along other roadways since total vehicle trips would be less and mode share for single occupant vehicles would be lower than the proposed Project, resulting in less noise from traffic on other roadways.

Alternative 3 would result in the largest mode shift away from single occupancy vehicles, the lowest vehicle hours traveled and lowest vehicle miles traveled. This reduction in traffic on roadways would result in comparatively less noise than the No Project or proposed Project.

CULTURAL RESOURCES

Cultural resources impacts would result if construction activities resulted in the change or demolition of historic structures, changes in the historical setting of historic structures, or damage or destruction of archeological remains or buried human remains.

Because they contain the most new construction, the proposed 2009 CTP and Alternatives 1, 2, and 3 will have the most potential to disturb, disrupt, or significantly affect cultural resources, including historical, archaeological, and paleontological resources and human remains. The No Project Alternative contains less new construction so it has less potential to affect cultural resources.

The Freeway Performance Initiative Alternative focuses on ICM and operational improvements. These improvements may create significant visual changes adjacent to historic structures or landmarks through signage but they are unlikely to include ground-disturbing activities in addition to those listed in the Project. The Frequent Service Transit Network Alternative also focuses on operational improvements and is unlikely to include ground-disturbing activities or activities which will create significant visual changes adjacent to historic structures or landmarks, so potential cultural impacts are also similar to the 2009 CTP and slightly less than the Freeway Performance Initiative Alternative.

The Greenhouse Gas Reduction Alternative focuses on programs and measures that reduce greenhouse gases, and will include a similar amount of ground-disturbing activities or activities with potential significant visual impacts on historic resources as the proposed Project. Therefore, the Greenhouse Gas Reduction Alternative potential cultural impacts are also similar to the 2009 CTP and slightly less than the Freeway Performance Initiative Alternative.

In summary, the No Project is environmentally superior to the proposed Project and the three alternatives in the cultural resources issue area. Impacts among the proposed Project and Alternatives 1, 2 and 3 are negligibly different from one another in terms of cultural resource impacts.

HAZARDOUS MATERIALS

Significant but mitigable impacts would occur under the proposed Project and all alternatives, resulting from the construction of new or expanded transportation networks. Overall, there are not substantial differences in hazardous materials impacts associated with implementation of the proposed 2009 CTP compared to Alternatives 1, 2, and 3.

The No Project Alternative would result in comparatively fewer impacts related to hazardous materials compared to the Project and three alternatives. When compared to the No Project Alternative, impacts related to Hazardous Materials would likely be greater under the proposed Project due to the increased number of transportation network expansion projects but still mitigable.

LAND USE AND HOUSING

Impacts on land use are discussed in three main issue areas— agricultural land conversion, displacement or division of housing and/or businesses and conflicts with local plans.

Potentially significant and unavoidable impacts would occur under the proposed Project and all alternatives on agricultural lands. Compared to the No Project Alternative, impacts would likely be greater under the proposed Project due to the increased number of transportation network expansion projects. However, given that all of the major projects with high potential to impact farmlands are in the No Project, as shown in table 2.11-3, the potential to impact farmland still exists with the No Project. Impacts under Alternatives 1 through 3 are expected to be similar to impacts under the proposed project.

Significant but mitigable impacts would occur under the No Project Alternative and the Project Alternative for displacement or division of housing—both permanent and construction related—resulting from the construction of new or expanded transportation networks. When compared to the No Project Alternative, impacts would likely be greater under the Project Alternative due to the increased number of transportation network expansion projects, but still mitigable. Impacts under Alternatives 1 through 3 are expected to be similar to impacts under the proposed project. While the projects would not generally divide or displace communities, the transit alternative may offer additional benefit in terms of increasing access, particularly to low income communities because they tend to be more transit dependent. Finally, the added costs to transportation in the Greenhouse Gas Reduction Alternative may reduce connectivity for low income groups by increasing the cost of driving.

No adverse impacts are expected from the proposed Project or alternatives on patterns of growth since any final transportation plan for Contra Costa must occur in the framework of the RTPC bottom-up planning process, as described in Section 2.11.

GLOBAL WARMING AND GREENHOUSE GASES

As shown in Table 3.1-11, when Pavley Rules are taken into consideration, the proposed 2009 CTP as well as Alternatives 1, 2, and 3 would all result in a slight reduction in greenhouse gas emissions when compared to the existing condition. The No Project would result in slightly more greenhouse gas emissions than existing conditions. The Greenhouse Gas Reduction Alternative has the largest decrease in emissions from existing conditions.

Table 3.1-11 Transportation Greenhouse Gas Emissions, Assuming Pavley 1 and 2 (emissions in metric tons)

	Pavley Factor from MTC	Daily CO ₂ Emissions	% Change from Existing Conditions	Daily CO ₂ e Emissions	% Change from Existing Conditions
<i>Existing Conditions</i>	-	12,200	-	12,444	-
No Project	0.66	12,364	1.3%	12,612	1.3%
Project	0.67	11,968	-1.9%	12,208	-1.9%
<i>Alt 1 Freeway Performance Initiative</i>	0.67	11,967	-1.9%	12,206	-1.9%
<i>Alt 2 Frequent Transit Service Network</i>	0.67	11,957	-2.0%	12,197	-2.0%
<i>Alt 3 Greenhouse Gas Reduction</i>	0.67	11,943	-2.1%	12,182	-2.1%

Source: Dyett and Bhatia, 2008

Overall, the implementation of AB 1493 (Pavley) is the primary reason for decline in CO₂e emissions from existing conditions to the Project, and Alternatives 1, 2, and 3. This finding indicates the importance of fuel efficiency regulation. Population growth and related increases in transportation system demand, including an overall increase in VMT, are projected to 2030 for all alternatives. A reduction in CO₂e, given the increase in VMT in the future, can only be achieved through a multi-faceted approach.

The impact of reducing congestion is evident in the summary of emissions. The EMFAC factor for determining emissions varies between alternatives based on the average speed, which is an indicator for congestion. The Greenhouse Gas Reduction Alternative has the least congestion, as indicated by the highest average speed, and the lowest CO₂e emissions. At the same time, the No Project alternative has the highest CO₂e emissions, despite the lowest VMT and a lower MTC-based Pavley factor, due to having the lowest speeds and highest congestion. The proposed Project and Alternatives 1 and 2 have lower emissions than the No Project.

In addition, impacts of sea level rise would be primarily consistent between the Project and the three alternatives given the same network of projects. Potential impacts are less with the No Project because fewer projects are vulnerable to sea level rise and storm surge. For instance, the Martinez Ferry landside improvements and Phase III improvements for the Martinez intermodal project are not included in the No Project and would be subject to flooding.

The contributing factors to the cumulative impact are true for all alternatives. At the same time, the mitigation measures which include planning for infrastructure protection, investments in vulnerability analysis, and exploring the potential for important realignments, also apply to all alternatives. Because the three alternatives vary from the Project primarily in operational and programmatic differences, it can be expected that the contribution to the cumulative effect would be the same. The No Project would have a slightly smaller contribution due to the smaller number of projects. On the other hand, congestion in the No Project alternative is the highest, indicating that the system would not be able to redistribute traffic throughout the system as efficiently as other Alternatives in case of a storm surge. Generally, the existing infrastructure network in all cases represents a significant cumulative risk, and the additional

risk added by the proposed Project or the Alternatives does not make a considerable contribution to this risk.

The environmentally preferable alternative in reference to climate change and greenhouse gas emissions would be the Greenhouse Gas Reduction Alternative. This alternative provides the greatest reduction in greenhouse gas emissions as well as the greatest reduction in congestion, indicating a system that would respond effectively to redistribution of traffic in a storm surge situation.

Environmentally Superior Alternative

The CEQA Guidelines require each EIR to identify the environmentally superior alternative among the alternatives analyzed. If the No Project alternative is identified as the environmentally superior alternative, then the EIR must identify another alternative as environmentally superior among the alternatives analyzed.

No Project Alternative

Since it includes somewhat fewer projects than the proposed Project and the three Alternatives, the No Project Alternative would likely have fewer construction-related impacts overall. In addition, it is the best option in terms of energy impacts because of the indirect energy used in construction and maintenance of the expanded system in the Project scenario. However, the No Project Alternative has higher levels of adverse effects in the important issue areas of transportation, air quality, and greenhouse gas emissions due to increased congestion.

Alternative 1: Freeway Performance Initiative (FPI)

This alternative focuses on improving freeway capacity throughout Contra Costa to reduce congestion. The impacts of Alternative 1 are very similar to the proposed Project. The FPI Alternative would be preferable to the No Project and proposed Project for transportation, air quality, and greenhouse gas emissions. It would be comparable to Alternative 2 but would perform slightly less well than Alternative 3 for these indicators. It would also be preferable to the Project in terms of Energy and comparable to Alternative 2, but would have fewer environmental benefits in terms of energy when compared to Alternative 3 or the No Project. Alternative 1 would have the most potential for impacts on visual and cultural resources due to the added signage that would be required on scenic highways and potentially adjacent to cultural resources.

Alternative 2: Frequent Service Transit Network (FSTN)

This Alternative focuses on increasing transit service in Contra Costa County. It is effective at increasing transit use and reducing congestion, though its impact is negligible when compared with Alternatives 1 and 3. The impacts of Alternative 2 are also very similar to the proposed Project. The FSTN Alternative would be preferable to the No Project and proposed Project for transportation, air quality, and greenhouse gas emissions. It would be comparable to Alterna-

tive 1 but would perform slightly less well than Alternative 3 for these indicators. It would also be preferable to the Project in terms of energy and comparable to Alternative 1, but would have fewer environmental benefits in terms of energy when compared to Alternative 3 or the No Project. In addition to these impacts, Alternative 2 would also provide a beneficial impact for low income communities by providing the most transit service.

Alternative 3: Greenhouse Gas Reduction Alternative

This alternative employs pricing strategies as well as policy strategies to limit the impact of the transportation system on greenhouse gas emissions and climate change. To this end, this alternative is successful. The impacts of Alternative 3 are preferable to the No Project, Project, and Alternatives 1 and 2 for transportation, air quality and greenhouse gas emissions.

It would also be preferable to the proposed Project in terms of energy, but would have a slightly smaller decline in energy use when compared to the No Project. This is largely due to the fact that the No Project includes the least construction and thus the lowest indirect energy use, while still seeing the benefit of increased roadway energy efficiency. The Greenhouse Gas Reduction Alternative would result in the second largest decline of 6.1 percent, primarily because average speeds are highest in this Alternative and thus emissions are lower. While this Alternative is very effective at reducing the impacts of the 2009 CTP in many regards, there may be additional considerations in terms of using a pricing strategy and how that would impact access throughout the Contra Costa, particularly for low-income residents. For the remaining indicators the difference from the Project and other Alternatives is negligible.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE DETERMINATION

As described above, there are tradeoffs among the various issue areas. In several cases, the overall difference between the proposed Project and Alternatives is very minor. For instance, the proposed Project and Alternatives 1 through 3 the same network improvements involving expansion and construction, and therefore their impacts are similar for many of the issue areas, including biological resources, hydrology and water resources, geology and seismicity, visual resources, noise, cultural resources, hazardous materials, and land use. Many of the impacts for these issue areas include short-term construction effects that are localized and temporary.

For many of the areas that are largely impacted by changes in the use of the transportation system, such as increases in VMT, and decreases in congestion. Alternatives 1, 2 and 3 would result in slightly less congestion and fewer VMT than the proposed Project and so have preferred outcomes. This applies in particular to the issue areas of air quality, noise, greenhouse gases, and energy. The proposed Project offers environmental advantages over the No Project in transportation, air quality, noise, and greenhouse gases. It also offers environmental advantages over Alternative 3 in Land Use and Housing, and environmental advantages over the Freeway Performance Initiative in visual resources, noise, and cultural resources.

Because the No Project Alternative has fewer roadway and rail improvements, it would have the fewest direct physical impacts. The No Project Alternative, however, also results in less favorable transportation, air quality, and greenhouse gas emissions impacts when compared to the proposed Project or Alternatives 1 through 3. Conversely, Alternative 3 results in the greatest transportation, air quality, and greenhouse gas emission benefits compared to the proposed Project and the other Alternatives, but given that it includes more projects than the No Project, it would also have greater direct physical impacts than the No Project. Many of the direct impacts on issue areas such as biological resources, hydrology and water resources, visual resources, noise, cultural resources, and hazardous materials have similar environmental impacts resulting from Alternatives 1, 2 and 3, with the Highway Performance Initiative performing slightly less well due to the addition of signage.

This CEQA analysis concludes that **the Greenhouse Gas Reduction alternative is the environmentally superior alternative**, primarily because it provides environmental advantages relative to the proposed Project, No Project and Alternatives 1 and 2 in the key issue areas of transportation, air quality, and greenhouse gas emissions. Also, it provides environmental advantages over the Project and Alternatives 1 and 2 in energy. The only area in which the Greenhouse Gas Reduction Alternative does not provide environmental advantages is in land use, due to potential impacts on accessibility associated with increased costs, though its impacts related to the evaluated criteria were similar to the other alternatives. Given the potential for overall environmental advantages, the Greenhouse Gas Reduction Alternative is considered the environmentally superior alternative.

PROJECT OBJECTIVES

While all Alternatives would meet the basic goals of the CTP, there are tradeoffs in the varying degrees of success at achieving the objectives of the proposed Project. For instance, the Freeway Performance Initiative Alternative is effective at reducing congestion during peak hours, whereas the Frequent Service Transit Network Alternative provides more convenient and affordable alternatives to single-occupant automobile use.

FEASIBILITY

There may be some concerns regarding the feasibility of implementing the Greenhouse Gas Reduction Alternative. This Alternative presumes that CCTA has the authority to impose new pricing strategies, some of which are likely subject to legislative or voter approval. The Authority, however, may not have this authority to implement pricing strategies, or would need to rely on other agencies or new authority to do so. For those strategies that do require legislative or voter approval, an economic downturn may reduce public support for “taxing” schemes that intentionally raise the price of driving.

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