California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

April 25, 2013

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814
http://www.calepa.ca.gov/EPAbldg/location.htm

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
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TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO: http://www.arb.ca.gov/lispub/comm/bclist.php

April 25, 2013
9:00 a.m.

Spanish translation services will be provided for this meeting.

CONSENT CALENDAR:
The following item on the consent calendar will be voted on by the Board immediately after the start of the public meeting, unless removed from the consent calendar either upon a Board member's request or if someone in the audience wishes to speak on it. Attached are the Proposed Resolutions the Board will consider for consent items listed below. Any attachment(s) to the resolutions are located at http://www.arb.ca.gov/board/ma/2013/ma042513.pdf.

Consent Item #

13-5-1: Public Meeting to Consider Approval of the Yuba City-Marysville PM2.5 Maintenance Plan and Redesignation Request

The Board will consider approval of the Feather River Air Quality Management District's 24-hour PM2.5 maintenance plan for the Yuba City-Marysville area, including a request that the U.S. Environmental Protection Agency designate the area as attainment. The plan demonstrates that the area has been in compliance with the standard since 2008 and will continue to maintain the standard in the future.

13-5-2: Public Meeting to Consider Greenhouse Gas Quantification Determination for the Tahoe Metropolitan Planning Organization's Sustainable Communities Strategy

The Board will consider acceptance of the Tahoe Metropolitan Planning Organization's determination that with implementation of its 2012 Sustainable Communities Strategy the region's per capita greenhouse gas emissions reduction targets set by ARB for 2020 and 2035 would be met.

13-5-3: Public Meeting to Consider Greenhouse Gas Quantification Determination for the Butte County Association of Government's Sustainable Communities Strategy

The Board will consider acceptance of the Butte County Association of Government's determination that with the implementation of its 2012 Sustainable Communities Strategy the region's per capita greenhouse gas emissions reduction targets set by ARB for 2020 and 2035 would be met.

DISCUSSION ITEMS:

Note: The following agenda items may be heard in a different order at the Board meeting.

Agenda Item #

13-5-4: Public Hearing on Greenhouse Gas Reduction Fund - Draft Investment Plan for Cap and Trade Auction Proceeds

The Board will conduct the public hearing required by AB 1532 (Perez, Stat. 2012, Chap. 807) on the Administration's draft three-year investment plan for Cap and Trade Auction Proceeds.

13-5-5: Update the Board on Indoor Air Quality

Staff will discuss ARB's indoor air quality research activities and how the results have supported regulations and programs to improve air quality in homes and schools.

13-5-6: Update the Board on Refinery Emergency Preparedness

Staff will update the Board on the air-monitoring efforts associated with the Chevron refinery incident. The update will highlight the air-monitoring efforts during the incident, the actions taken since the incident, and ARB's future plans to improve local and state-level preparedness.

CLOSED SESSION

The Board will hold a closed session, as authorized by Government Code section 11126(e), to confer with, and receive advice from, its legal counsel regarding the following pending or potential litigation, and as authorized by Government Code section 11126(a):

POET, LLC, et al. v. Goldstene, et al., Superior Court of California (Fresno County), Case No. 09CECG04850; plaintiffs' appeal, California Court of Appeal, Fifth District No. F064045.

Rocky Mountain Farmers Union, et al. v. Goldstene, U.S. District Court (E.D. Cal. Fresno), Case No. 1:09-CV-02234-LJO-DLB; interlocutory appeal, U.S. Court of Appeal, Ninth Circuit Nos. 09-CV-02234 and 10-CV-00163.

American Fuels and Petrochemical Manufacturing Associations, et al. v. Goldstene, et al., U.S. District Court (E.D. Cal. Fresno) Case No. 1:10-CV-00163-AWI-GSA; interlocutory appeal, U.S. Court of Appeal, Ninth Circuit Nos. 09-CV-02234 and 10-CV-00163.

Association of Irritated Residents, et al. v. U.S. E.P.A., 2011 WL 310357 (C.A.9), (Feb. 2, 2011). California Dump Truck Owners Association v. California Air Resources Board, U.S. District Court (E.D. Cal. Sacramento) Case No. 2:11-CV-00384-MCE-GGH; plaintiffs' appeal,

U.S. Court of Appeals, Ninth Circuit, Case No. 13-15175.

California Construction Trucking Association v. United States Environmental Protection Agency, U.S. Court of Appeals, Ninth Circuit, Case No. 13-70562.

Engine Manufacturers Association v. California Air Resources Board, Sacramento Superior Court, Case No. 34-2010-00082774.

Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board, San Francisco Superior Court, Case No. CGC-12-519554.

California Chamber of Commerce et al. v. California Air Resources Board, Sacramento Superior Court, Case 34-2012-80001313.

Sierra Club, et al. v. Tahoe Regional Planning Agency, United States District Court, Eastern District (Sacramento) No.2:13-at-00133.

Delta Construction Company, et al., v. United States Environmental Protection Agency (United States District Court of Appeals, District of Columbia Circuit, Case No. 11-1428).

City of Los Angeles Through Department of Water and Power v. California Air Resources Board, et al., Superior Court of California, County of Los Angeles, Case No. BS140620.

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of three minutes to ensure that everyone has a chance to speak.

TO ELECTRONICALLY SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO:

http://www.arb.ca.gov/lispub/comm/bclist.php

(Note: not all items are available for electronic submittals of written comments.)

ONLINE SIGN-UP:
You can sign up online in advance to speak at the Board meeting when you submit an electronic Board item comment. Note: not all items are available for online sign-up. For more information go to:

http://www.arb.ca.gov/board/online-signup.htm

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:
1001 I Street, 23rd Floor, Sacramento, California 95814
(916) 322-5594
ARB Homepage: www.arb.ca.gov

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 7 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveido para alguna de las siguientes:

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- Documentos disponibles en un formato alterno u otro idioma;
- Una acomodación razonable relacionados con una incapacidad.

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SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

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INDEX

April 25, 2013

Agenda #		Pages
13-5-1	Public Meeting to Consider Approval of the Yuba City-Marysville PM2.5 Maintenance Plan and Redesignation Request	1-22
13-5-2	Public Meeting to Consider Greenhouse Gas Quantification Determination for the Tahoe Metropolitan Planning Organization's Sustainable Communities Strategy	23-82
13-5-3	Public Meeting to Consider Greenhouse Gas Quantification Determination for the Butte County Association of Government's Sustainable Communities Strategy	83-132
13-5-4	Public Hearing on Greenhouse Gas Reduction Fund - Draft Investment Plan for Cap and Trade Auction Proceeds	133-137
13-5-5	Update the Board on Indoor Air Quality	---
13-5-6	Update the Board on Refinery Emergency Preparedness	---

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER APPROVAL OF THE YUBA CITY-MARYSVILLE PM2.5 MAINTENANCE PLAN AND REDESIGNATION REQUEST

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider the proposed Redesignation Request and Maintenance Plan submittal for the Yuba City-Marysville fine particulate matter (PM2.5) nonattainment area that was developed and approved by the Feather River Air Quality Management District (District). If approved, ARB will submit this to the U. S. Environmental Protection Agency (U.S. EPA) for approval as a revision to the California State Implementation Plan (SIP).

DATE: April 25, 2013

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., April 25, 2013. This item is scheduled to be heard on the Board's Consent Calendar. All items on the Consent Calendar will be voted on by the Board immediately after the start of the public meeting. Any item may be removed from the Consent Calendar at the request of a Board member or if someone in the audience would like to speak on that item.

In December 2006, U.S. EPA lowered the 24-hour national ambient air quality standard (standard) for PM2.5 from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. Effective December 14, 2009, U.S. EPA designated the Yuba City-Marysville Area as nonattainment for the more stringent 24-hour PM2.5 standard. The federal Clean Air Act establishes planning requirements for those areas that exceed the health-based standards. These nonattainment areas must develop and implement a SIP that demonstrates how they will attain the standards by specified dates. The SIP submittal deadline for the revised 24-hour PM2.5 standard is December 14, 2012.

Under the U.S. EPA's *Clean Data Policy for the Fine Particulate National Ambient Air Quality Standards* (Clean Data Policy), nonattainment areas that attain the standard prior to the SIP submittal deadline are eligible for reduced regulatory requirements. Based on quality-assured federal reference method monitoring data for 2006-2008, the Yuba City Marysville PM2.5 nonattainment area has demonstrated attainment of the 24-hour PM2.5 standard and continues to attain based on the most recent air quality data.

On June 8, 2010, ARB requested the "clean data" finding for the 24-hr PM2.5 standard for this area. On January 10, 2013, U.S. EPA determined that the Yuba City-Marysville nonattainment area has attained the 24-hour PM2.5 standard. Based on this determination, U.S. EPA also suspended the majority of the planning elements under the Clean Air Act, including the attainment demonstration, reasonable further progress demonstration, reasonably available control measures, and contingency elements of a SIP.

To address the remaining requirements, on April 1, 2013, the District adopted the *Yuba City-Marysville PM2.5 Nonattainment Area Redesignation Request and Maintenance Plan* (Redesignation Request/Maintenance Plan). The Redesignation Request/Maintenance Plan officially requests that this area be redesignated to attainment for the PM2.5 standard.

ARB staff has reviewed the District submittal and has concluded that it meets the applicable Clean Air Act requirements. ARB staff has determined that the Redesignation Request/Maintenance Plan would ensure continued maintenance of the standard for the required ten years following redesignation. Staff is recommending that the Board approve the *Yuba City-MarysvillePM2.5 Nonattainment Area Redesignation Request and Maintenance Plan* as a revision to the California SIP and the request to be redesignated from nonattainment to attainment for the PM2.5 standard.

ARB Staff Report will be available prior to the meeting. Copies of the report may be obtained from ARB's Public Information Office, 1001 I Street, First Floor, Environmental Services Center, Sacramento, California, 95814, (916) 322-2990. The report may also be obtained from ARB's website at: http://www.arb.ca.gov/planning/sip/sip.htm

Interested members of the public may present comments verbally or in writing at the meeting and may be submitted by postal mail or by electronic submittal before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, April 24, 2013,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the meeting so that ARB staff and Board members have additional time to consider each comment. Further inquiries regarding this matter should be directed to Ms. Sylvia Vanderspek, Manager, Particulate Matter Analysis Section, Planning and Technical Support Division at (916) 324-7163 or Ms. Kasia Turkiewicz, Air Resources Engineer, Particulate Matter Analysis Section, Planning and Technical Support Division at (916) 445-6497.

SPECIAL ACCOMMODATION REQUEST

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CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: March 25, 2013

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.

State of California

California Environmental Protection Agency

AIR RESOURCES BOARD

Staff Report

Yuba City-Marysville PM2.5 Maintenance Plan and Redesignation Request

Release Date:

Scheduled for Consideration: April 25, 2013

This document has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

TABLE OF CONTENTS

I. **BACKGROUND** 1

II. **REDESIGNATION REQUIREMENTS** 2

III. **EVALUATION OF THE REDESIGNATION REQUEST/MAINTENANCE PLAN** 2

A. Monitoring Shows Compliance with PM2.5 Standard 3

B. Applicable Act Requirements are Satisfied 4

C. Attainment Results from Permanent and Enforceable Emission Reductions 4

D. Maintenance Plan Provides for Continuing Attainment 4

1. Attainment Year Emission Inventory 4

2. Maintenance Demonstration 6

3. Motor Vehicle Emission Budgets 8

4. PM2.5 Monitoring Network 8

5. Verification of Continued Attainment 8

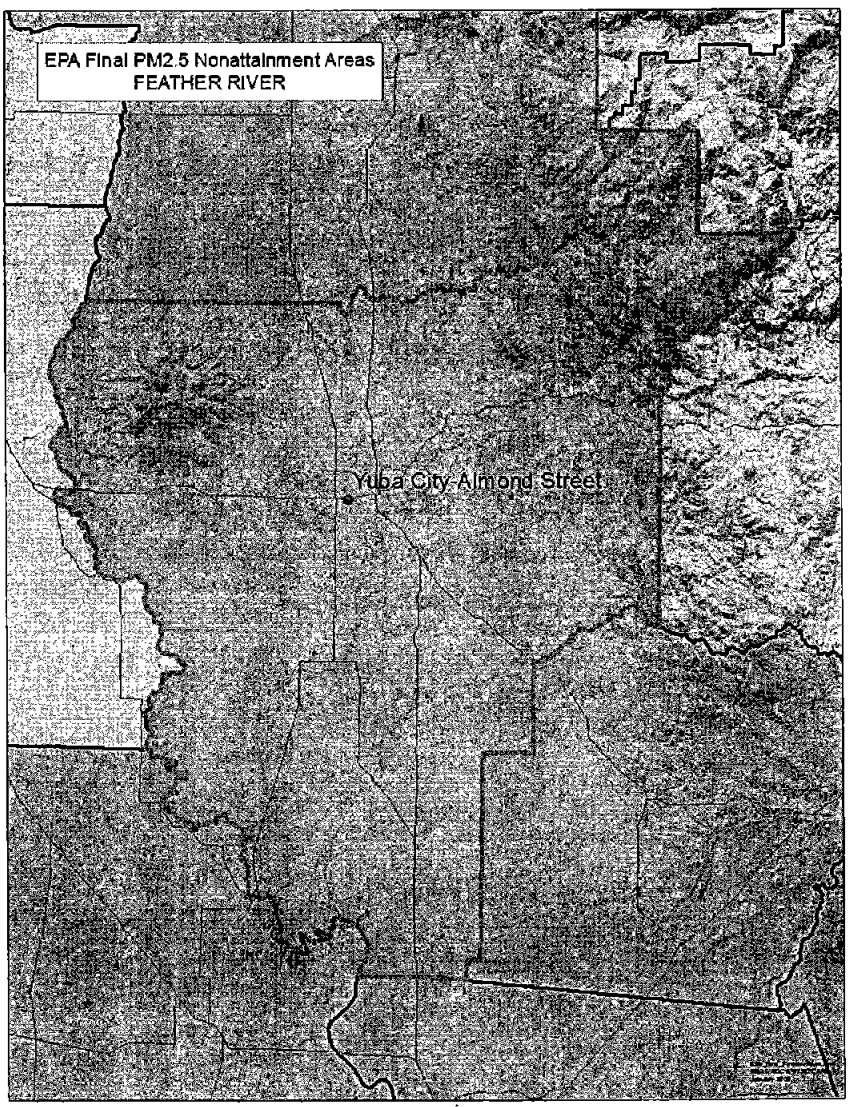
6. Contingency Plan 8

IV. **STAFF RECOMMENDATION** 9

I. BACKGROUND

The Yuba City-Marysville area in the Feather River Air Quality Management District (District) was designated as nonattainment for the 2006 24-hour fine particulate (PM2.5) National Ambient Air Quality Standard (standard) on December 14, 2009. The nonattainment area includes Sutter County and a portion of Yuba County and was designated nonattainment based on 2005 to 2007 Federal Reference Monitor (FRM) data. Figure 1 outlines the nonattainment area and shows the location of the monitoring site. The Yuba City-Marysville nonattainment area has a single PM2.5 FRM monitor, which in 2007 had a design value of 40 ug/m3. Beginning in 2008, the 24-hour design value has been below the standard.

Figure 1. Map of the Yuba City-Marysville PM2.5 Nonattainment Area



8

II. REDESIGNATION REQUIREMENTS

On June 8, 2010, ARB submitted a request to the U.S. Environmental Protection Agency (U.S. EPA) to find the Yuba City-Marysville nonattainment area in attainment of the 35 ug/m3 24-hour PM2.5 standard. The U.S. EPA took final action on January 10, 2013 determining that the area attained the standard. This clean data finding, under the U.S. EPA *Clean Data Policy for the Fine Particulate National Ambient Air Quality Standards* (Clean Data Policy), suspends the majority of the planning elements under the Clean Air Act (Act).

Air Resources Board (ARB) staff reviewed the District's *Yuba City-Marysville PM2.5 Nonattainment Area Redesignation Request and Maintenance Plan* (Redesignation Request/Maintenance Plan) within the context of the Act, which identifies the following requirements an area must meet to be redesignated to attainment:

A. The area has attained the standard;
B. The applicable implementation plan is fully approved under Act section 110 (k), and the area has met all applicable requirements of Act section 110 and part D;
C. The PM2.5 air quality improvements are due to permanent and enforceable emission reductions; and
D. The area has a fully approved maintenance plan satisfying section 175A of the Act.

The Act also sets the general framework for maintenance plans[1]. Each PM2.5 maintenance plan must provide for continued maintenance of the PM2.5 standard for ten years after redesignation and include the following components:

1. Attainment emission inventory;
2. Maintenance demonstration;
3. Commitment to continue the monitoring network operation;
4. Commitment for verification of continued attainment; and
5. Contingency plan to promptly correct any violation of the PM2.5 standard that occurs after the area has been redesignated.

III. EVALUATION OF THE REDESIGNATION REQUEST/MAINTENANCE PLAN

Based on review of the District Redesignation Request/Maintenance Plan and supporting technical analysis, ARB staff concurs that the Redesignation Request/Maintenance Plan meets the Act's requirements. The following sections describe the major elements of the Redesignation Request/Maintenance Plan.

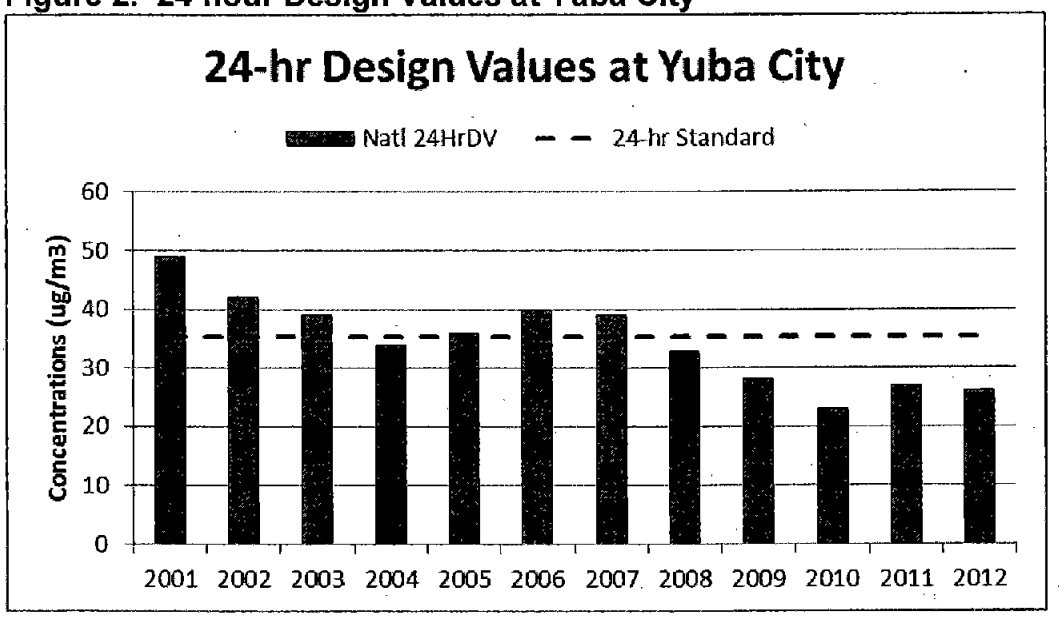
[1] Calcagni, John, Memorandum, *Procedures for Processing Requests to Redesignate Areas to Attainment, Office of Air Quality Planning and Standards*, Research Triangle Park, North Carolina, September 4, 1992. http://www.epa.gov/ttn/oarpg/t5/memoranda/redesignmem090492.pdf

A. Monitoring Shows Compliance with PM2.5 Standard

As shown in Figure 2, PM2.5 air quality has improved significantly over the last few years in the Yuba City-Marysville nonattainment area. PM2.5 is measured at a single monitoring station, Yuba City-Almond Street (Figure 1), where an FRM sampler collects 24-hour average samples daily. The area first reached compliance with the 24-hour standard in 2008, with a design value of 33 ug/m3. The design value represents the 3-year average of the 98th percentile of 24-hour PM2.5 concentrations.
Although wildfires that occurred in the summer of 2008 resulted in a number of exceedances of the 24-hour standard, U.S. EPA's exceptional events rule allows for exclusion of exceedances due to natural events. Since then, the area has continued to measure compliance with the 24-hour standard. Figure 2 shows the design values at the Yuba City site between 2001 and 2012, demonstrating attainment.

Between 2001 and 2012, annual average and 24-hour PM2.5 design values in the Yuba City-Marysville nonattainment area decreased by nearly 50 percent due to ongoing emission reductions. The downward trend was not a result of "unusually favorable meteorology". Between 2008 and 2012, the area experienced a variety of meteorological conditions, including 2011 which was extremely conducive to high PM2.5 pollution including stagnation that persisted over 20 days. Despite this, 2011 and 2012 design values are significantly below the 24-hour standard.

Figure 2. 24-hour Design Values at Yuba City*



** 2008 wildfire impacts excluded from the design value calculation*

B. Applicable Act Requirements are Satisfied

ARB and the District have met all of the Act requirements applicable for a PM2.5 nonattainment area to be considered for redesignation. On June 8, 2010, ARB requested a "clean data" finding for the 24-hour PM2.5 standard for this area. On January 10, 2013, U.S. EPA signed a final rule determining that the Yuba City-Marysville nonattainment area has attained the 24-hour PM2.5 standard based on 2009-2011 data. This clean data finding suspended the obligation to submit State Implementation Plan (SIP) elements that provide for attainment of the standard, implementation of all reasonably available control measures, reasonable further progress (RFP), and implementation of contingency measures for failure to meet deadlines for RFP and attainment. The only SIP element remaining is an emission inventory. To address the remaining SIP requirement, the District Redesignation Request/Maintenance Plan includes a 2011 winter emission inventory.

C. Attainment Results from Permanent and Enforceable Emission Reductions

Numerous District and State emission control programs have been adopted and implemented over the last several years, providing permanent and enforceable reductions in direct PM2.5 and PM2.5 precursor emissions. Many of these programs will provide additional emission reductions during the maintenance period, ensuring continued compliance with the standard. The Redesignation Request/Maintenance Plan lists post-2006 control measures that are responsible for the significant improvements in PM2.5 air quality, including restrictions on open burning and residential fuel combustion, and on-road and off-road motor vehicle and equipment control programs.

D. Maintenance Plan Provides for Continuing Attainment

Section 175A of the Act establishes the required elements of a maintenance plan for areas seeking redesignation from nonattainment to attainment. Using an attainment year inventory and future inventory projections, plans must demonstrate continued attainment through the first 10-year maintenance period. Comprehensive inventories were developed for the representative attainment year (2011), an interim year (2017), and the end of the maintenance period (2024) for directly emitted PM2.5 and PM2.5 precursors.

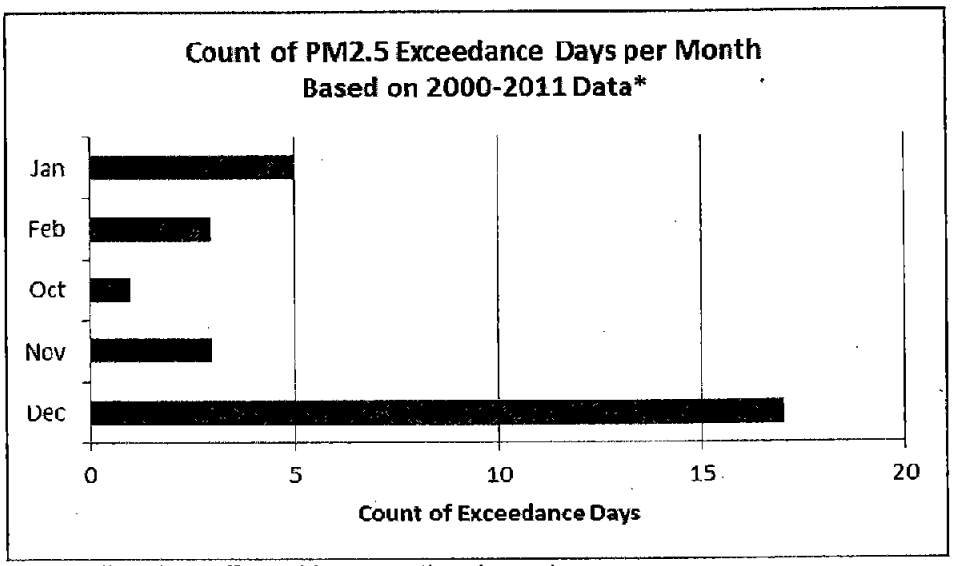
1. Attainment Year Emission Inventory

An emission inventory is a critical tool used to support evaluation, control, and mitigation of air pollution which is comprised of a systematic listing of the sources of air pollutants along with the amount of pollutants emitted from each source or category over a given period of time. Emission inventories are estimates of the air pollutant emissions released into the environment – they are not direct ambient concentration

measurements. As part of the maintenance plan, the District submitted an attainment year inventory characterizing emissions in the maintenance area.
U.S. EPA recommends that the attainment year inventory be from one of the three years used to demonstrate attainment. In case of the Yuba City-Marysville nonattainment area, 2011 was selected as an attainment year inventory coinciding with the last year in the U.S. EPA clean data finding. The attainment year inventory includes emissions of PM2.5, volatile organic compounds (VOCs), oxides of nitrogen (NOx), oxides of sulfur (SOx), and ammonia (NH3).

An emission inventory should be consistent with the nature of the air quality problem. Since the 2006 24-hour PM2.5 standard was designated to protect against peak exposures, the inventory should reflect the season when most exceedances occur. As demonstrated in the Redesignation Request/Maintenance Plan and also shown in Figure 3, all of the highest PM2.5 concentrations in the Yuba City-Marysville nonattainment area over the course of the year occur during the winter. Therefore, the winter inventory developed for the attainment year and future years is the most appropriate for SIP planning purposes. Table 1 lists 2011 winter emission inventories split by source category.

Figure 3. Total Count of Exceedance Days per Month Based on 11 Years of Data



** Excluding data affected by exceptional events.*

Table 1. Attainment Year Winter Emission Inventory (tons/day)

Category	VOC	NOX	SOX	PM2.5	NH3
STATIONARY	4.0	4.4	0.1	0.9	0.4
AREAWIDE	5.5	1.1	0.1	3.8	4.5
ON-ROAD MOTOR VEHICLES	2.8	8.4	0.0	0.3	0.2
OTHER MOBILE SOURCES	2.3	5.4	0.1	0.3	0.0
TOTAL	14.6	19.3	0.4	5.3	5.0

2. Maintenance Demonstration

In order to demonstrate maintenance of the PM2.5 24-hour standard through the year 2024, the District compiled an emission inventory for an attainment year (2011) and formulated projections for the intermediate year (2017) and for the final year of the maintenance period (2024). The attainment year and projected inventories represent winter emissions which reflect the nature of the PM2.5 problem in the area. If each of the projected emission levels is less than the emissions for the attainment year, maintenance of the standard is demonstrated. This approach assumes that ambient concentrations will remain below the standard as long as future emissions are kept below the attainment year emissions. The interim and future year inventories include banked Emission Reduction Credits (ERCs) to demonstrate that the addition of ERC's will not compromise attainment.

The maintenance demonstration includes emissions of direct PM2.5, SOx, and NOx. The U.S. EPA PM2.5 implementation rule specifies that a precursor is considered "significant" for control strategy development purposes when a significant reduction in the emission of that precursor pollutant leads to a significant decrease in PM2.5 concentration. Such pollutants are known as "PM2.5 attainment plan precursors" (72 FR 20586). The PM2.5 implementation rule also established a presumption that PM2.5, NOx, and SOx are attainment plan precursors, while VOCs and ammonia are not unless they are needed for attainment demonstration or are significant for maintaining the NAAQS.

Although speciation data is not routinely collected, limited data provided by the U.S. EPA as part of the designation process indicates that carbonaceous aerosols and nitrate are main contributors to high PM2.5 values. Carbonaceous aerosols are the largest component, contributing about 54 percent of the mass, followed by nitrate, which is responsible for about 38 percent of the mass. Although these data are based on 2004-2006 samples, the data collected at other northern and central California sites indicate that while the number of high days has decreased, the high day composition remains similar from year to year due to the nature of the PM2.5 problem.

High PM2.5 values occur exclusively under stagnant winter conditions leading to accumulation of primary pollutants and formation of secondary components. While carbonaceous aerosols are primarily directly emitted into the air, nitrates are secondary pollutants formed in the atmosphere from gaseous NOx emissions and ammonia. ARB's programs aimed at reducing NOx emissions have played an important role in reducing the nitrate fraction of PM2.5. Long term nitrate and NOx data collected throughout the State demonstrate that reductions in ambient NOx concentrations have resulted in commensurate reductions in PM2.5 nitrate concentrations. Past modeling and monitoring studies in northern and central California highlight that reductions in VOCs are not important for reducing either carbonaceous aerosols or nitrate; therefore, they would not provide any benefit in reducing PM2.5 concentrations. Based on the nature of the PM2.5 problem and an understanding of precursor effectiveness, as well

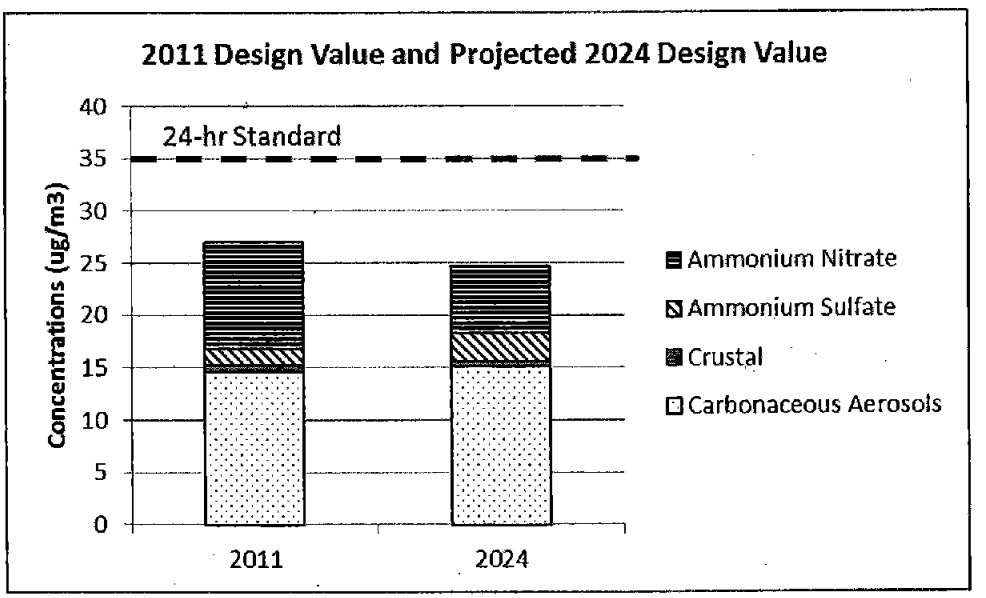
as the fact that the area has already attained the standard, VOCs and ammonia are therefore not significant PM2.5 precursors.

The consolidated emission projections for the Yuba City-Marysville nonattainment area are presented in Table 2. Between 2011 and 2024, emissions of NOx are projected to decline 37 percent while emissions of SOx and direct PM2.5 are projected to increase by a small amount. The plan demonstrates maintenance of the 24-hour PM2.5 standard because the potential increase in directly emitted PM2.5 and SOx emissions will be fully offset by a greater decrease in nitrate concentrations, as illustrated in Figure 5. Additionally, the level of 2011 emissions corresponds to a design value of 27 ug/m3, which is 24 percent below the standard. This provides additional assurance that 2017 and 2024 design values will remain below the standard.

Table 2. Projected Changes in Emissions between 2011 and 2024 (tons/day)

Year	2011	2017	2024	2024-2011
PM2.5	5.3	5.5	5.4	0.2
NOx	19.3	15.3	11.6	-7.7
SOx	0.4	0.6	0.6	0.2
ERC's included in the Above Future Year Inventories				
PM2.5		1.3	1.3	
NOx		0.9	0.9	
SOx		0.2	0.2	

Figure 5. Comparison of Measured 2011 and Projected 2024 Design Value



3. Motor Vehicle Emission Budgets

The Redesignation Request/Maintenance Plan establishes PM2.5 and NOx transportation conformity budgets for 2017 and 2024 to ensure that future emissions from on-road mobile sources provide for continuing attainment of the PM2.5 24-hour standard (Table 3). The District determined that mobile source emissions of VOCs, ammonia, SOx, re-entrained road dust, and highway and transit construction dust are not significant for maintaining the standard and do not need motor vehicle emission budgets.

Table 3. Motor Vehicle Emission Budgets (tons/day)

Year	NOx			PM2.5
	Adjusted Budgets	Safety Margin	Total Budgets	Total Budgets
2017	4.6	0.7	5.3	0.2
2024	2.6	0.5	3.1	0.2

4. PM2.5 Monitoring Network

The existing PM2.5 monitoring network in the Yuba City-Marysville nonattainment area includes a PM2.5 FRM monitor located at 773 Almond Street in Yuba City operating on a daily schedule, and a non-Federal Equivalence Method (non-FEM) Beta Attenuation Monitor (BAM) running in parallel to the FRM. Together, these two monitors provide the necessary data to demonstrate continuous compliance with the standard as well as support Air Quality Index reporting, forecasting air quality episodes, and making burn decisions in the agricultural burning program.

5. Verification of Continued Attainment

The ARB is responsible for monitoring PM2.5 air quality within the Yuba City-Marysville nonattainment area. The ARB also oversees the quality assurance of PM2.5 data and submits annual monitoring network plans to U.S. EPA on behalf of the District. The ARB commits to maintaining an appropriate PM2.5 monitoring network through the maintenance period, with any potential changes to be developed in collaboration with U.S. EPA and subject to stakeholder review. To verify continued attainment of the PM2.5 standard, the ARB will continue to conduct PM2.5 monitoring and expeditiously review data as it becomes available to evaluate any risk of impending violations. This will be used as potential trigger for early action in the contingency plan.

6. Contingency Plan

The Act requires the maintenance plan to include contingency provisions for prompt correction of any PM2.5 standard violation that might occur after the area has been redesignated to attainment. The maintenance plan is not required to contain fully adopted contingency measures that will go into effect without further state action as is

required in attainment SIPs. Instead, for maintenance plans, the area must have a plan to ensure that contingency measures are adopted once they are triggered.

The District will use the 24-hour design value as the contingency plan trigger. In the event that the 24-hour design value exceeds the standard, within 60 days the District will commence analysis, including meteorological evaluation of high PM2.5 days and emission inventory assessment. The District will also analyze the PM2.5 and meteorological data to rule out exceptional events or instrument malfunction. If a design value triggers the contingency plan, the District will complete sufficient analyses, by November 1 of the following year, to begin adoption of necessary rules for ensuring attainment and maintenance of the 24-hour standard. If new rules are necessary, they would be adopted by August 31 of the year following the completed analysis. ARB staff believes the contingency requirements in the Redesignation Request/Maintenance Plan are adequate to protect air quality in the area.

IV. STAFF RECOMMENDATION

ARB staff has reviewed the Redesignation Request/Maintenance Plan for the Yuba City-Marysville nonattainment area and consulted with District staff during this review. ARB staff finds that the Redesignation Request/Maintenance Plan meets all applicable Act requirements. The monitoring data shows that the area has attained the 24-hour PM2.5 standard, and the maintenance demonstration shows that the standard will be maintained for ten years.

Therefore, staff recommends that the Board adopt the *Yuba City-Marysville PM2.5 Nonattainment Area Redesignation Request and Maintenance Plan* as a revision to the California SIP for submittal to U.S. EPA. In addition, ARB staff recommends that the Board approve the District's request that the Yuba City-Marysville nonattainment area be redesignated from nonattainment to attainment for the federal 24-hour PM2.5 standard.

PROPOSED

State of California
AIR RESOURCES BOARD

Yuba City-Marysville PM2.5
Maintenance Plan and Redesignation Request

Resolution 13-14

April 25, 2013

Agenda Item No.: 13-5-1

WHEREAS, the Legislature in Health and Safety Code section 39602 has designated the State Air Resources Board (ARB or Board) as the air pollution control agency for all purposes set forth in federal law;

WHEREAS, ARB is responsible for preparing the State Implementation Plan (SIP) for attaining and maintaining the National Ambient Air Quality Standards (NAAQS) as required by the federal Clean Air Act (the Act; 42 U.S.C. section 7401 et seq.), and to this end is directed by the Health and Safety Code section 39602 to coordinate the activities of all local and regional air pollution control and air quality management districts (districts) necessary to comply with the Act;

WHEREAS, section 39602 of the Health and Safety Code also provides that the SIP shall include only those provisions necessary to meet the requirements of the Act;

WHEREAS, ARB has responsibility for ensuring that the districts meet their responsibilities under the Act pursuant to sections 39002, 39500, 39602, and 41650 of the Health and Safety Code;

WHEREAS, ARB is authorized by section 39600 of the Health and Safety Code to do such acts as may be necessary for the proper execution of its powers and duties;

WHEREAS, sections 39515 and 39516 of the Health and Safety Code provide that any duty may be delegated to the Board's Executive Officer as the Board deems appropriate;

WHEREAS, the local districts have primary responsibility for controlling air pollution from nonvehicular sources and for adopting control measures, rules, and regulations to attain the NAAQS within their boundaries pursuant to sections 39002, 40000, 40001, 40701, 40702, and 41650 of the Health and Safety Code;

WHEREAS, the Feather River Air Quality Management District (Feather River District) is responsible for carrying out these responsibilities in Yuba and Sutter Counties pursuant to section 40300 of the Health and Safety Code;

WHEREAS, in December 2006, the United States Environmental Protection Agency (U.S. EPA) lowered the 24-hour NAAQS for fine particulate matter (PM2.5) from 65 $\mu g/m^3$ to 35 $\mu g/m^3$;

WHEREAS, effective December 14, 2009, U.S. EPA designated the Yuba City-Marysville Planning Area as nonattainment for the 35 $\mu g/m^3$ PM2.5 NAAQS, and established a SIP due date of December 14, 2012;

WHEREAS, in March 2007, U.S. EPA finalized the PM2.5 implementation rule (Rule) which established the framework and requirements that states must meet in developing PM2.5 SIPs;

WHEREAS, nonattainment areas that attain the standard prior to the SIP submittal due date are eligible for reduced regulatory requirements as described in U.S. EPA's *Clean Data Policy for the Fine Particulate National Ambient Air Quality Standards* released on December 14, 2004 (Clean Data Policy);

WHERAS, when a nonattainment area has air quality levels below the standard, the Clean Data Policy specifies that the attainment demonstration, reasonable further progress, reasonably available control measures, and contingency SIP elements are no longer required;

WHEREAS, consistent with section 107(d)(3)(E) of the Act, the Feather River District has demonstrated attainment of the PM2.5 NAAQS in the 2006-2008 period for the Yuba City-Marysville PM2.5 nonattainment area, based on quality-assured federal reference method monitoring data from the State and local monitoring network;

WHEREAS, on June 8, 2010, ARB submitted a request to the U.S. EPA to issue a clean data finding for the Yuba City-Marysville PM2.5 nonattainment area based on 2009-2011 data;

WHEREAS, on January 10, 2013, U.S. EPA determined that the Yuba City-Marysville PM2.5 nonattainment area has attained the 24-hour PM2.5 NAAQS based on 2009-2011 data;

WHEREAS, section 107(d)(3)(D) of the Act provides that a state may request U.S. EPA to redesignate an area from nonattainment to attainment of the NAAQS;

WHEREAS, section 107(d)(3)(E) of the Act sets forth the requirements which must be met for the U.S. EPA to redesignate an area from nonattainment to attainment of the NAAQS;

WHEREAS, the Feather River District developed the *Yuba City-Marysville PM2.5 Nonattainment Area Redesignation Request and Maintenance Plan* (Redesignation Request/Maintenance Plan) to address the requirements of the Act;

WHEREAS, consistent with section 107(d)(3)(E)(ii) of the Act, the Feather River District prepared the Redesignation Request/Maintenance Plan in part to meet the requirement for an approvable PM2.5 SIP under section 110(k) of the Act;

WHEREAS, consistent with section 107(d)(3)(E)(iii) of the Act, the Feather River District demonstrated in the Redesignation Request/Maintenance Plan that improvement in air quality is due to permanent and enforceable emission control measures;

WHEREAS, consistent with section 107(d)(3)(E)(iv) of the Act, the Feather River District prepared the Redesignation Request/Maintenance Plan in part to meet the maintenance plan requirement of section 175A of the Act;

WHEREAS, consistent with section 107(d)(3)(E)(v) of the Act, ARB and the Feather River District prepared the Redesignation Request/Maintenance Plan in part to meet the requirements of section 110 and part D of the Act;

WHERAS, consistent with 172(c)(3) of the Act, the Redesignation Request/Maintenance Plan includes an attainment emission inventory for directly emitted PM2.5 and its precursors;

WHERAS, consistent with section 175A of the Act, the Redesignation Request/Maintenance Plan shows attainment and maintenance of the 24-hr PM2.5 NAAQS through 2024;

WHERAS, consistent with section 175A of the Act, the Redesignation Request/Maintenance Plan includes contingency provisions to ensure prompt correction of any post-redesignation violation of the PM2.5 NAAQS;

WHEREAS, consistent with section 176 of the Act, the Feather River District developed transportation conformity budgets for PM2.5 and NOx using the most recent estimates of emissions for 2011 and projections to 2024;

WHEREAS, federal law - set forth in section 110(l) of the Act and Title 40, Code of Federal Regulations (CFR), section 51.102 - requires that one or more public hearings, preceded by at least 30 day notice and opportunity for public review, must be conducted before adopting and submitting any SIP revision to U.S. EPA;

WHEREAS, as required by federal law, the Feather River District made the Redesignation Request/Maintenance Plan Submittal available for public review at least 30 days before the Feather River District hearing;

WHEREAS, following a public hearing on April 1, 2013, the Governing Board of the Feather River District voted to approve the Redesignation Request/Maintenance Plan Submittal;

WHEREAS, the California Environmental Quality Act (CEQA) requires that no project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, to meet the requirements of CEQA, the Feather River District proposed a Notice of Exemption under CEQA for the Redesignation Request/Maintenance Plan Submittal which was noticed to the public on March 1, 2013 and adopted at a public meeting on April 1, 2013;

WHEREAS, on April 2, 2013, the Feather River District transmitted the Redesignation Request/Maintenance Plan Submittal to ARB as a SIP revision, along with proof of public notice publication, and environmental documents in accordance with State and federal law;

WHEREAS, the Board finds that:

1. California's air pollution control programs have successfully reduced PM2.5 ambient concentrations leading to PM2.5 NAAQS attainment in Yuba City-Marysville PM2.5 nonattainment area;

2. The Redesignation Request/Maintenance Plan complies with the requirements of section 107(d)(3)(E) of the Act;

3. The Redesignation Request/Maintenance Plan is necessary for U.S. EPA to redesignate Yuba City-Marysville PM2.5 nonattainment area to attainment for the PM2.5 NAAQS;

4. The Redesignation Request/Maintenance Plan addresses current attainment and continued maintenance of the 24-hour PM2.5 NAAQS through 2024;

5. Consistent with U.S. EPA guidance, the Redesignation Request/Maintenance Plan includes an attainment emission inventory, commitments by the Feather River District and ARB to continue operating the PM2.5 monitoring network, and a process to verify continued PM2.5 attainment;

6. The Redesignation Request/Maintenance Plan includes contingency provisions to assure prompt correction of any post-redesignation violation of the PM2.5 NAAQS;

7. The Redesignation Request/Maintenance Plan has identified nonattainment area-level winter PM2.5 and NOx emission budgets for transportation conformity for 2017 and 2024 based on current emissions and activity data, and the budgets are adequate to ensure continued maintenance of the PM2.5 NAAQS; and

8. The Redesignation Request/Maintenance Plan relies entirely on adopted regulations to demonstrate continued maintenance. These adopted Feather River District and ARB regulations are reflected in the baseline emission projections in the Redesignation Request/Maintenance Plan and were subject to environmental review such that no further analysis is required at this time.

WHEREAS, the Board finds that the Redesignation Request/Maintenance Plan Submittal meets all applicable PM2.5 planning requirements established by the Act and the Rule; and

WHEREAS, the Board further finds that ARB has reviewed and considered the Redesignation Request/Maintenance Plan Submittal, along with comments presented by interested parties, and finds that it meets the requirements of the Act and CEQA;

NOW, THEREFORE, BE IT RESOLVED that the Board hereby adopts the Redesignation Request/Maintenance Plan Submittal as a revision to the California SIP.

BE IT FURTHER RESOLVED that the Board hereby directs the Executive Officer to forward the Redesignation Request/Maintenance Plan Submittal as adopted to U.S. EPA for inclusion in the SIP to be effective, for purposes of federal law, upon approval by U.S. EPA.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to work with the Feather River District and U.S. EPA and take appropriate action to resolve any completeness or approvability issues that may arise regarding the SIP submission.

BE IT FURTHER RESOLVED that the Board authorizes the Executive Officer to include in the SIP submittal any technical corrections, clarifications, or additions that may be necessary to secure U.S. EPA approval.

BE IT FURTHER RESOLVED that the Board hereby certifies pursuant to 40 CFR section 51.102 that the Feather River District's Redesignation Request/Maintenance Plan Submittal was adopted after notice and public hearing as required by 40 CFR section 51.102.

TECHNICAL EVALUATION OF THE GREENHOUSE GAS EMISSION REDUCTION QUANTIFICATION FOR TAHOE METROPOLITAN PLANNING ORGANIZATION/ TAHOE REGIONAL PLANNING AGENCY'S SB 375 SUSTAINABLE COMMUNITIES STRATEGY

April 2013

California Environmental Protection Agency

Air Resources Board

Electronic copies of this document can be found on ARB's website at
http://www.arb.ca.gov/cc/sb375/sb375.htm.

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

TAHOE REGION 1

Background 1

Regional Plan Update and the RTP/SCS 1

APPLICATION OF ARB STAFF REVIEW METHODOLOGY 3

Data Inputs and Assumptions 3

Modeling Tools 4

Performance Indicators 4

DATA INPUTS AND ASSUMPTIONS 4

Demographics and the Regional Growth Forecast 4

Current and Future Land Use Development Patterns 9

Transportation Network Inputs and Assumptions 12

Travel Demand Inputs and Assumptions 16

MODELING TOOLS 17

Activity-Based Travel Demand Model 17

Post-Processor Model 24

EMFAC Model 26

Overall Adjustment Impacts 27

PERFORMANCE INDICATORS 27

Land Use Indicators 28

Transportation-Related Indicators 30

CONCLUSION 31

REFERENCES AND DOCUMENTATION 33

Appendix A: 2010 CTC RTP Guidelines Addressed in TMPO/TRPA's RTP.....34

Appendix B: Modeling Parameters for SCS Evaluation (Data Table) 37

LIST OF TABLES

Table 1: Description of Land Use Alternatives 2

Table 2: Tahoe's Growth Forecast 5

Table 3: Allocation of New Housing by California Jurisdiction, 2013-2021 6

Table 4: Land Use Classification 12

Table 5: Lake Tahoe Region Base Year Lane Miles by Functional Class 12

Table 6: Reported Lake Tahoe Region Roadway Capacity 13

Table 7: Tahoe Region Free-Flow Speed by Area Type 14

Table 8: California-Specific Non-motorized Facility Lane Miles 15

Table 9: Region Average Reported Trip Length by Mode 16

Table 10: Modeled Household Auto-Ownership and Census Results 19

Table 11: Modeled and Observed Travel Distance and Travel Time 20

Table 12: Range of Percent of Mode Share for Mandatory Tours 21

Table 13: Time Periods Used in Activity Based Model 22

Table 14: Regional Assigned Traffic Volume and Traffic Counts 22

Table 15: Base Year Static Model Validation Results 23

Table 16: Assumption on the Transit Service and Facility Strategy 26

Table 17: Assumption on the Bike and Pedestrian Strategy 26

LIST OF FIGURES

Figure 1: Housing Unit Projection 7

Figure 2: Population Projection 8

Figure 3: Employment Forecast 9

Figure 4: Tahoe's Land Use Pattern 11

Figure 5: Existing and Proposed Bicycle and Pedestrian Facilities 15

Figure 6: TMPO/TRPA's Modeling Tools 17

Figure 7: Structure of the Activity-Based Travel Demand Model 18

Figure 8: Existing Distribution of Residential Development, 2010 28

Figure 9: Forecast Distribution of Residential Development, 2035 29

Figure 10: Weekday Per Capita Passenger Vehicle VMT and CO_2 30

EXECUTIVE SUMMARY

SB 375 (Steinberg, Chapter 728, Statutes of 2008), also known as the Sustainable Communities and Climate Protection Act, aims to reduce greenhouse gas (GHG) emissions from passenger vehicle travel through improved transportation and land use planning at the regional scale. It requires ARB to set GHG emission reduction targets for passenger vehicles for 2020 and 2035 for the State's federally-designated Metropolitan Planning Organizations (MPOs), including the Tahoe Metropolitan Planning Organization (TMPO) which represents the California portion of the Tahoe region.

SB 375 requires each MPO to explicitly consider the impact of land use patterns and transportation choices on GHG emissions by developing a Sustainable Communities Strategy (SCS) that meets ARB's targets. The SCS is incorporated into an MPO's Regional Transportation Plan (RTP) that is prepared every four or five years. ARB approved regional targets for each of the State's MPOs at its September 23, 2010, hearing. As they relate to the California portion of the Lake Tahoe region, the targets established by the Board call for a 7 percent reduction in per capita GHG emissions in 2020 and a 5 percent reduction in 2035 relative to 2005.

The Tahoe Metropolitan Planning Organization and the Tahoe Regional Planning Agency (TRPA) jointly released the Public Review Draft of their Regional Transportation Plan (RTP), also known as "Mobility 2035", on April 25, 2012. Mobility 2035 incorporates the region's SCS and contains integrated land use and transportation strategies for achieving the region's GHG emission reduction targets for 2020 and 2035.

On December 12, 2012, TMPO adopted the Public Review Draft RTP/SCS with minor modifications. On January 22, 2013, TMPO/TRPA submitted its SCS to ARB for review of its determination and appropriate action. The adopted SCS demonstrates that, if implemented, the California portion of the Tahoe region will achieve a 12.1 percent per capita GHG emission reduction in 2020, and a 7.2 percent reduction in 2035.

This report describes both the method ARB staff used to review TMPO/TRPA's SCS GHG quantification and the results of ARB staff's technical evaluation. The evaluation was conducted using ARB's methodology for review of GHG emission calculation procedures from SCS plans[1], tailoring the general methodology to address the unique characteristics of the Tahoe region.

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[1] Description of Methodology for ARB Staff Review of Greenhouse Gas Reductions from Sustainable Communities Strategies (SCS) Pursuant to SB 375 (July 2011).

TAHOE REGION

Background

In California, Metropolitan Planning Organizations are responsible for preparing Regional Transportation Plans (RTPs). MPOs are also responsible for implementing the California Sustainable Communities and Climate Protection Act of 2008 (SB 375). This law requires preparation of a Sustainable Communities Strategy as part of the RTP to reduce regional GHG emissions from automobiles and light trucks for metropolitan regions within the State.

The Tahoe Metropolitan Planning Organization (TMPO) was created in 1999 by the Governors of California and Nevada, under federal authority (23 United States Code Section 134-135). TMPO is responsible for adopting the RTP for the Lake Tahoe region, and the SCS for the California portion of the region.

The Tahoe Regional Planning Agency (TRPA) is the land use planning agency responsible for approving the Tahoe Regional Plan Update. TRPA operates under the authority of the Bi-State Regional Planning Compact (Compact). Adopted in 1969, the Compact calls for a Regional Plan to establish a balance between the natural environment and the human-made environment. Goals and policies of the Regional Plan are intended to guide decision-making as it affects Tahoe's resources and environmental threshold standards.

Portions of California legislation, SB 575 (Steinberg)[2] and SB 375 address the linkage between land use and transportation planning for the California side of the Tahoe region, and thus the link between the RTP, including the SCS, and the Regional Plan Update. TMPO/TRPA's existing land use regulations and transportation programs contribute to attainment and maintenance of environmental threshold standards for the Tahoe region. The Tahoe Regional Plan Update focuses on expansion of transit services and accessibility through the design of residential development patterns, the walkability of communities, and the use of economic incentives and disincentives to promote achievement of air quality.

Regional Plan Update and the RTP/SCS

TRPA developed five land use forecast alternatives intending to encourage redevelopment and an effective transportation strategy that would help to mitigate adverse transportation conditions, facilitate attainment and maintenance of environmental threshold standards, and contribute to meet the per capita GHG targets associated with reduced vehicle miles traveled (VMT). Table 1 provides a list of the five land use alternatives.

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[2] SB 575 (Steinberg), Local planning: housing element (2009). See also http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0551-0600/sb_575_bill_20091011_chaptered.html.

Table 1: Description of Land Use Alternatives

Alternatives	Description
1	No project, existing land use plan
2	Low development, increased regulation
3	Low development, highly incentivized redevelopment
4	Reduced development, incentivized redevelopment
5	Similar rate of development and regulatory structure of the 1987 Regional Plan

The alternative development patterns in TMPO/TRPA's analysis utilized the same regional projections, such as housing/ tourist accommodation units (TAU), employment, and population growth. Each alternative considers a mix of land use planning frameworks, the land use allocation system, environmental regulations and environmental incentives programs, and transportation strategies.

Preferred Alternative

TMPO/TRPA selected Alternative 3 (low development and highly incentivized redevelopment) as the preferred scenario. This alternative changes the existing land use designation for commercial/public services to mixed-use, and focuses on environmental redevelopment of the existing built environment, such as community centers that provide sidewalks, trails, and transit access, with a streamlined regulatory process. The current Plan Area Statements (PAS) and Community Plans (CP) land use planning system remain in place under this alternative, but also add three special planning districts categories: Town Centers, Regional Centers, and High Density Tourist Districts. TMPO/TRPA is proposing these new categories as areas targeted for redevelopment. Alternative 3 is built to accommodate an anticipated population increase in the California portion of the Tahoe region of approximately 5,900 new residents by 2035 and the construction of new Commercial Floor Area (CFA) and TAUs.

In addition to federal and state laws and regulation requirements, TMPO's RTP/SCS serves as the transportation plan element of TRPA's Regional Plan Update. The RTP/SCS contains three transportation strategies, designated A, B, and C. Each transportation strategy includes several subsets of transportation projects and is paired to one of the five land use alternatives considered in the Regional Plan Update process.

TMPO/TRPA coupled the Alternative 3 land use development scenario with the RTP's Transportation Strategy Package C, consisting of a variety of bicycle and pedestrian strategies, revitalization projects, the Lake Tahoe Waterborne Transit Project, and

enhanced inter-regional transit operations. This combined alternative-strategy scenario provides for walkability and cycling within communities and more options for non-automotive transportation. Based on the Alternative 3 / Strategy C combination, GHG reductions of 12.1 percent by 2020 and 7.2 percent by 2035 are projected.

Tahoe's assumptions are consistent with guidance on developing SCS planning assumptions provided in the California Transportation Commission's (CTC) 2010 RTP Guidelines (see Appendix A for applicable guideline elements).

APPLICATION OF ARB STAFF REVIEW METHODOLOGY

In July 2011, ARB staff released to the public a methodology that details how ARB will evaluate MPO SCSs in order to fulfill its statutory responsibility under SB 375, which is to accept or reject the MPOs' determination that the SCS would, if implemented, meet the targets.

The review of TMPO/TRPA's SCS focused on the technical aspects of regional modeling that underlie the quantification of GHG reductions. This review examines TMPO/TRPA's model inputs and assumptions, modeling tools, application of the model, and modeling results.[3]

ARB staff tailored the general methodology to be applicable for TMPO/TRPA's SCS to address the unique characteristics of the Tahoe region and transportation modeling approach. ARB staff evaluated how TMPO/TRPA's models operate and perform in estimating travel demand, and how well they provide for quantification of GHG emissions reductions associated with the SCS. In evaluating TMPO/TRPA's model sensitivity, ARB staff examined how well TMPO/TRPA's travel demand model replicated observed results and whether the application of the post processing tool was appropriate and achieved reasonable results.

ARB staff's evaluation used publicly available information in TMPO/TRPA's RTP/SCS, including RTP technical appendices, and the model description and validation reports. In order to assess technical soundness and general accuracy of TMPO/TRPA's GHG quantification, three central components of TMPO/TRPA's GHG analyses were evaluated: data inputs and assumptions, modeling tools, and performance indicators.

Data Inputs and Assumptions

ARB staff evaluated TMPO/TRPA's key model inputs with underlying data sources and assumptions to confirm they represent current and reliable data for use in their model.

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[3] The review was based on the general method described in ARB's July 2011 document entitled "Description of Methodology for ARB Staff Review of Greenhouse Gas Reductions from Sustainable Communities Strategies Pursuant to SB 375."
http://www.arb.ca.gov/cc/sb375/scs_review_methodology.pdf

This involved using publicly available, authoritative sources of information, such as national and statewide survey data on socio-economic and travel factors. Relevant model inputs for GHG quantification that ARB staff reviewed included: 1) regional socio-economic characteristics, 2) the region's transportation network, and 3) travel inputs. Pertinent documentation of region-specific forecasting processes and approaches were also evaluated.

Modeling Tools

TMPO/TRPA's modeling documentation reports were reviewed to assess how well their travel demand model replicates observed results based on both the latest socioeconomic, and travel data inputs and assumptions used to model the SCS. TMPO/TRPA's post processor documentation and results were also reviewed to assess whether an appropriate methodology was used to quantify the expected reduction in GHG emissions. In addition, TMPO/TRPA's modeling practices were reviewed for consistency with the CTC's "2010 California Regional Transportation Plan Guidelines," the Federal Highway Administration's (FHWA) "Model Validation and Reasonableness Checking Manual," and other key modeling guidance and reference documents (see Appendix A for more detailed information).

Performance Indicators

Performance indicators are used to test the model for sensitivity to changes in VMT, whether through changes in travel modes, vehicle trip distances, or land use. TMPO/TRPA developed two performance indicators -- residential density and passenger VMT -- to evaluate the effect of implementing the RTP/SCS. ARB staff performed a qualitative evaluation of these individual indicators to determine if increases or decreases are directionally consistent with TMPO/TRPA's modeled GHG emissions reductions.

DATA INPUTS AND ASSUMPTIONS

TMPO/TRPA's RTP/SCS modeling approach is based upon a number of inputs and assumptions which influence the effectiveness of the GHG emission reduction strategies. Inputs and assumptions are entered into the model to characterize existing and future land use, socio-economic data, and transportation network characteristics. ARB staff evaluated the appropriateness of the data that were used and the model's response to changes in these inputs and assumptions.

Demographics and the Regional Growth Forecast

Demographic inputs and assumptions describe the number and key characteristics of the population expected to be living, working, and travelling in a region. To estimate the effects on GHG emissions for the region, ARB staff reviewed each of these inputs.

Table 2 summarizes TMPO/TRPA's estimate of population, employment and housing for the region and the California portion of the region for 2005, 2010, 2020, and 2035.

Table 2: Tahoe's Growth Forecast

Year	Population		Employment		Housing Units	
	California[1]	Region[2]	California[1]	Region[2]	California[1]	Region[2]
2005	41,213	55,232	11,185	22,874	33,835	46,350
2010	41,176	54,473	11,354	22,605	35,260	47,392
2020	43,934	58,049	12,034	23,143	37,809	50,412
2035	45,468	60,365	12,854	23,804	38,921	51,552

[1] Describes the California portion of the Tahoe Region
[2] Describes the whole Tahoe Region (California and Nevada)

Tahoe's growth forecast is based on the 2010 U.S. Census. TMPO/TRPA used Census tract level data from eastern El Dorado County and from eastern Placer County to estimate the population of the California portion of the Tahoe region for 2010. ARB staff compared Department of Finance's (DOF) 2010 projections for El Dorado County and Placer County to the 2010 Census tracts, and confirmed that both data sets are consistent (estimates < 1%). TMPO/TRPA's growth forecast for future year projections is guided by the Regional Plan and implementing ordinances.

Tahoe's 1987 Regional Plan focused on growth control and on regulating development practices that degrade the natural and built environments. These growth control and environmental best practices are implemented through a development allocation system, environmental threshold carrying capacities, and land use ordinances. TMPO/TRPA updated its 1987 Regional Plan in conjunction with the 2012 RTP/SCS focusing on environmental redevelopment that will replace older, environmentally degrading developments with more sustainable development and restored landscapes.

The Regional Plan Update allocates to communities region wide development rights for new residential and tourist accommodation units, and commercial floor area over a 20-year planning horizon. New residential units may be allocated on remaining developable parcels in each jurisdiction. Additionally, TMPO/TRPA dedicates 600 new bonus units to multi-family, affordable, or moderate-income housing over the life of the plan, plus 874 bonus units that remain available from the 1987 Regional Plan. Bonus units may be used to incentivize transfers of development rights and existing development to enhance higher density town centers and away from sensitive parcels and parcels far from town centers. Residential densities in town centers could reach up to 25 units per acre. An additional 342 tourist accommodation units and 583,600 square feet of commercial floor area have also been allocated, almost all of which will be built in town centers.

Housing

The RTP/SCS assumes housing allocations from the Regional Plan Update under the preferred alternative for 2020 and 2035. For purposes of its analysis, TMPO/TRPA distributed bonus units to qualifying jurisdictions in areas designated as town centers. To allocate these units, TMPO/TRPA first calculated and classified the number of dwelling units by traffic analysis zones (TAZ) and by the U.S. Census designation of whether it is a year round residential or a secondary (vacation home) unit. It then calculated year round population and second-homeowner population. Finally, the income stratification of the dwelling units was classified and U.S. Census designation of persons per household by TAZ was used.

California jurisdictions must adopt housing element updates that demonstrate accommodation of an eight-year projection of housing need, known as the Regional Housing Needs Assessment (RHNA). In consultation with TMPO, the Sacramento Area Council of Governments (SACOG) projects the housing need for the California side of the Tahoe region.

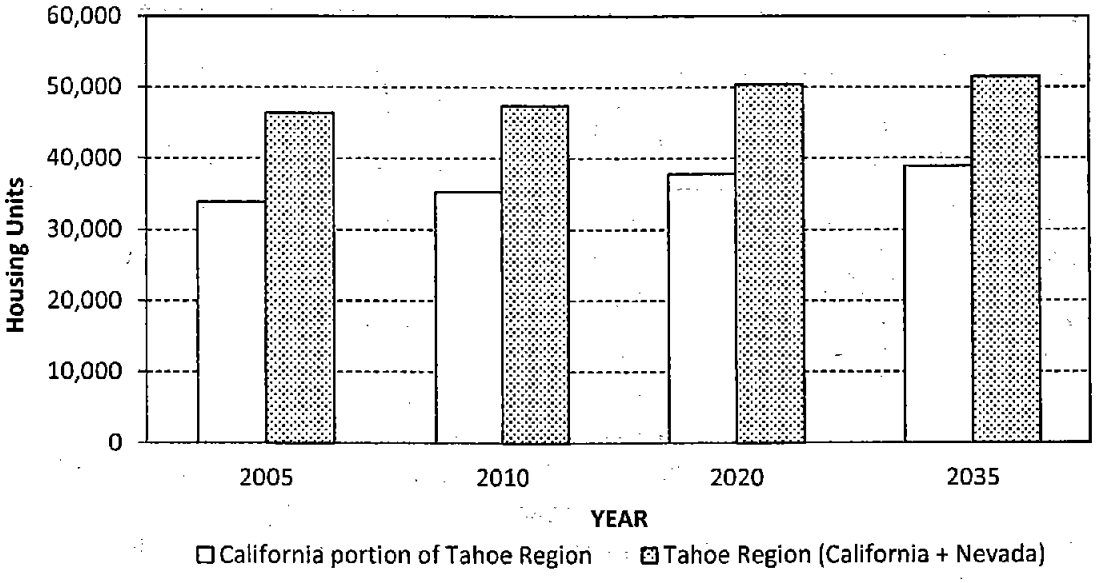
As a result, in December 2011, SACOG approved the new RHNA projections for 2013-2021 for the California portion of the Tahoe basin. The regional housing needs for Tahoe's California jurisdictions as well as the proposed SCS allocations are shown in Table 3.

Table 3: Allocation of New Housing by California Jurisdiction, 2013-2021

Jurisdiction	Total Housing Units RHNA Requirement	Total Housing Units Lake Tahoe SCS allocation
Placer County (Tahoe portion)	328	562
El Dorado County (Tahoe portion)	480	654
City of South Lake Tahoe	336	605
Total	**1,144**	**1,821**

Consistent with SB375 requirements, TMPO/TRPA's SCS provides sufficient housing to meet the total housing allocation. Since RHNA calls for MPOs to perform an eight-year projection, TMPO/TRPA converted the proposed SCS allocation to match the same eight-year time frame. Currently, the Tahoe region contains approximately 47,000 housing units, of which about 35,000 are located on the California side and 12,000 on the Nevada side. The largest number of housing units is single-family homes on medium-sized lots. The SCS assumes an increase in housing supply over time with additional multi-family housing in town centers.

Figure 1: Housing Unit Projection



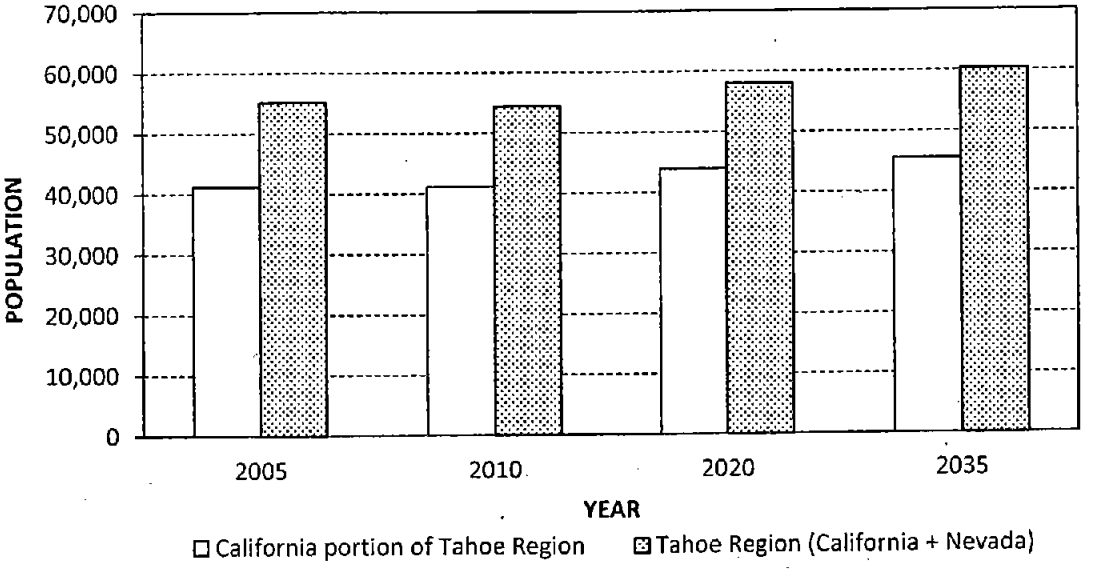
The Tahoe region is projected to add nearly 150 housing units per year between 2010 and 2035, or approximately 3,700 units total. The housing unit ratio between California and Nevada of 3-to-1 is expected to continue proportionally throughout 2035 (Figure 1). Between 2010 and 2020, TMPO/TRPA projects the California side will add approximately 2,500 housing units, and between 2020 and 2035 approximately 1,100 units.

Population

Population growth in the Tahoe region is constrained by limits on land use and environmental threshold carrying capacities defined in the Regional Plan. The 1987 Regional Plan provided for moderate growth and set initial limits by allocating the amount of residential, commercial, and tourist-related development. TMPO/TRPA uses the growth allocation system described above to distribute the forecast population.

The permanent residency forecast indicates that the California population of Tahoe is expected to grow by approximately 2,800 people between 2010 and 2020, and approximately 4,300 people between 2010 and 2035. U.S. Census population data for 2005 and 2010 shows the same ratio of 3-to-1 between California and Nevada continuing throughout the projection years 2020 and 2035 (Figure 2).

Figure 2: Population Projection



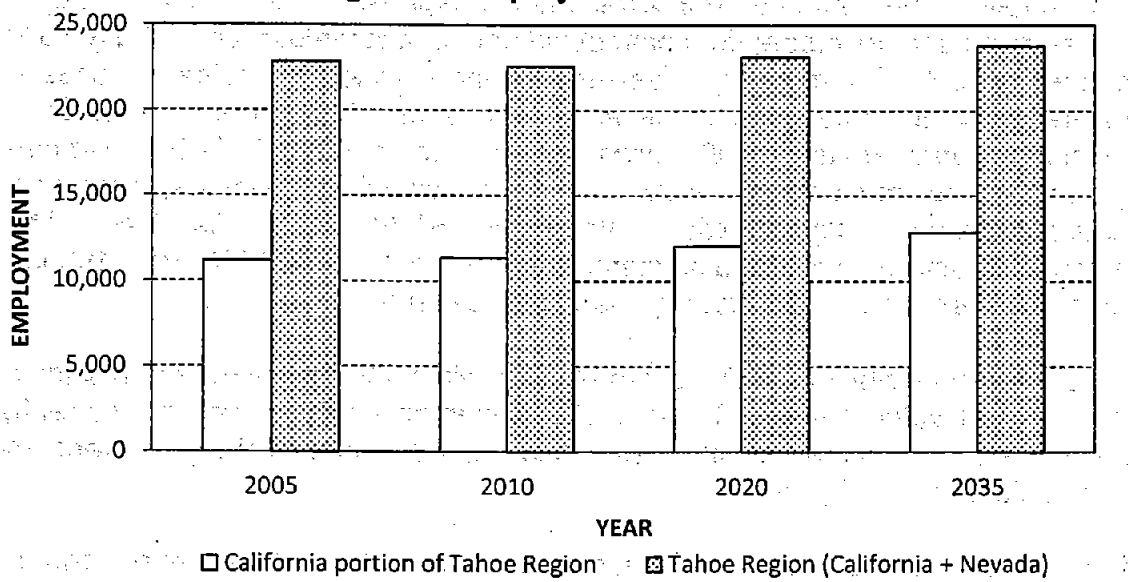
Between the forecast year and 2010, the baseline population remained steady, due in part to a declining regional economy and a dramatic increase in residential home prices starting in 2001.

Employment

Employment opportunities are projected based on the amount of available commercial floor area for 2005, 2010, 2020, and 2035. The floor area is allocated by local jurisdiction and calculated using Institute of Transportation Engineers (ITE) rates based on the ratio of employee-to-floor area. Tahoe's growth forecast anticipates approximately 540 new employees between 2010 and 2020, and approximately 1,200 new employees between 2010 and 2035 (Figure 3).

As a result of the recent recession there was a reduced rate of economic growth in the region since recreation, entertainment, and service industries are critical to the region's economic base.

Figure 3: Employment Forecast



While the regional population is split 3-to-1 California to Nevada, the employment split is almost even. This imbalance ratio has resulted in California permanent residents in the region commuting longer distances to regional employment centers. Statistics on seasonal residents suggest a similar imbalance.

The growth forecasts used in the SCS modeling analysis for housing, population, and employment used reasonable methodology. TMPO/TRPA relied on appropriate federal and state sources, such as the U.S. Census (2000 and 2010), household travel surveys, and growth projections. TMPO/TRPA also convened a local expert panel[4] to evaluate its growth forecast process. Tahoe's forecasting methods are consistent with those used by the U.S. Census Bureau and the California Department of Finance (DOF).

Current and Future Land Use Development Patterns

As part of the RTP development process, TMPO creates long-range land use forecasts that estimate the amount, type, and location of development. These development patterns account for Tahoe's population of seasonal and permanent residents and visitors, and include employment, households, and tourist accommodation units. This anticipated future growth pattern is the basis from which TMPO/TRPA plans for transportation system improvements that are needed to serve the region's future population and economic growth.

[4] Peer review panel included experts from the California Department of Transportation (Caltrans), local city planners and consultants.

Current Land Use

Approximately 12 percent or 24,000 acres out of a total of 201,500 acres, of the Tahoe land area has been developed for commercial, tourist accommodation, and residential uses (see Table 4). The majority of developed land is zoned for residential uses and is comprised primarily of detached single family residences. The permanent resident population is approximately 55,000, down from its peak of 63,000 in 2000. Commercial and tourist related land uses make up a smaller portion of the developed area and are found along the major transportation routes US 50, SR 28, and SR 89. Many of the commercial structures and establishments were built during the 1950s and 1960s and are characterized by strip development land use patterns.

There are approximately 47,400 residential units within the Tahoe region, including 2,034 units built within the last 10 years. Approximately 4,700 parcels are currently vacant in the region, primarily within residentially zoned lands. Tahoe's current land use pattern is illustrated in Figure 4.

Tahoe's development patterns are limited by environmental restrictions[5] on land uses and a marketable rights[6] transfer program, which constrains the amount of residential, commercial, and tourist development allowed in the region.

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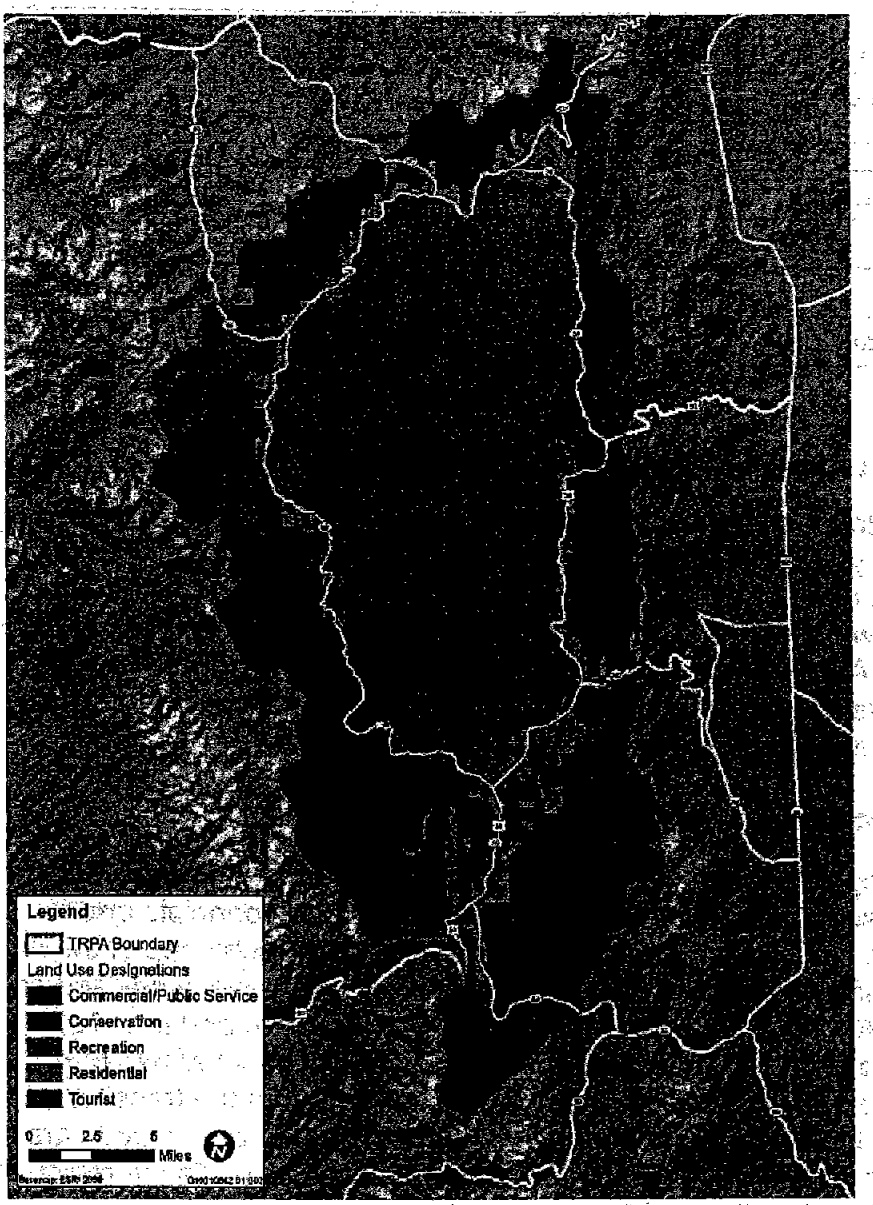
[5] TRPA Authority

[6] The Marketable Rights Transfer program promotes environmentally sensitive development by directing development to the most suitable areas, managing growth in a manner consistent with progress toward meeting environmental threshold standards, encouraging consolidation of development through transfer of development rights, allocations, and coverage, and conditioning approvals of projects on improved off-site erosion run-off control and air quality.

Figure 4: Tahoe's Land Use Pattern



Forecast Process

Land in the Tahoe region is assigned to one of five classifications: Conservation, Recreation, Residential, Commercial and Public Service, and Tourist. These classifications, summarized in Table 4, are further supplemented by PASs that provide a detailed planning guide within discrete areas of the region, including CP areas or areas targeted for scenic restoration, and affordable housing. PASs provide special planning considerations for specific areas, including policies, maximum densities for residential and tourist accommodation uses, community noise equivalent levels, allowable and special uses, and the permissible amount of additional recreation capacity.

Table 4: Land Use Classification

Land Use Classification	Acreage	Percentage
Conservation	132,326	65.7
Recreation	45,208	22.4
Residential	20,651	10.3
Commercial and Public Service	2,314	1.1
Tourist	967	0.48
Total	**201,466**	**100**

Transportation Network Inputs and Assumptions

The transportation network for the Tahoe region includes regional roadways and local streets, bus systems, water transit, rail lines, airports, sidewalks, and bike paths. TMPO/TRPA used an Activity-Based Travel Demand Model (ABM) to model the region's highway and transit networks, link capacity, and free-flow speed assumptions. Because the ABM was designed for modeling travel demand for the entire Tahoe region rather than just the California portion, model inputs discussed in this report are specified as either region-wide or California-specific.

Street Network

The Tahoe region's street network is a representation of the automobile roadway system, whose functional classification system includes principle arterial, minor arterial, collector, and centroid connector[7]. In the traffic assignment step of the ABM, the street network provides the basis of estimating zone-to-zone travel times and costs for each time period: AM Peak (AM), Midday (MD), PM Peak (PM) and Late Night (LN). Based on the 2006 and 2010 Travel Mode Share Surveys conducted by TMPO/TRPA, about one percent of the total number of trips is generated from the transit mode. Therefore, only the trips generated from the drive-alone and shared auto modes are assigned to the street network. Table 5 summarizes the reported Lake Tahoe region street lane miles in 2010 by functional class.

Table 5: Lake Tahoe Region Base Year Lane Miles by Functional Class

Functional Class	Lane Miles (2010)
Arterials	110
Collectors	155
Local street	464

[7] Centroid connectors are abstract links in the model, intended to represent local street access to the collector-and-above roadway network.

ARB staff compared the methodology TMPO/TRPA used in the street network development with the NCHRP Report 365[8]. TMPO/TRPA followed acceptable practice, and their methodology is consistent with the NCHRP 365 report. In addition, the functional classification definitions used in the street network are consistent with FHWA's Federal Functional Highway Classification system.

Street Capacity

Street capacity is defined as the number of vehicles that can pass a certain point of the street at free-flow speed in an hour. The travel demand model used street capacity as an input for estimating congestion.

The TMPO/TRPA ABM categorizes regional street capacities by functional class expressed in hourly capacity of vehicles-per-lane-per-hour (vplph), as summarized in Table 6.

Table 6: Reported Lake Tahoe Region Roadway Capacity

Functional Class	Street Capacity (vplph)	Base Multilane Highway Capacity, based on Free Flow Speed (vplph)
Principle arterial	1100	2200
Minor arterial	800	2100
Collectors	500	2000

TMPO/TRPA's assumptions used in the street network of their ABM are reasonable because the reported street capacities are within the FHWA's estimates of base multilane highway capacity based on free flow speed (FFS).

Free-Flow Speed

Travel demand models use free-flow speed to calculate the shortest travel time between the origin and the destination of a trip assigned to the street network. Factors that can affect the actual travel speed include the prevailing traffic volume on a link, posted speed limits, adjacent land use activity, functional classification of a street, type of intersection control, and spacing of intersection controls. The TMPO/TRPA ABM defines free-flow speeds by posted speed limits. The reported speed limits in the region are listed by area type in Table 7.

[8] The NCHRP Report 365 describes travel demand modeling theory and techniques, and their common applications by transportation planning agencies, and observed data for key modeling parameters at the national level.

[9] Base Capacity = 1,000+20*FFS; for Free Flow Speed (FFS) less than or equal to 60 mph.

Table 7: Tahoe Region Free-Flow Speed by Area Type

Area Type	Speed Limit (mph)
Rural	60
Suburban	55
Urban	50

The methodology TMPO/TRPA used in the estimation of free-flow speed based on the posted speed is consistent with the recommended practice indicated in the NCHRP Report 365.

Transit Network

The transit network in the ABM is used to calculate transit path travel time and cost between route stops in the system on the underlying street network, perform transit assignments, and measure accessibility. Transit services in the TMPO/TRPA area include bus, rail, and ferry for residents, workers, and visitors.

On-road transit service in the Tahoe region is currently limited to bus transit. Therefore, the ABM's modeled transit network was based on information from the local bus routes, bus stops information, and the underlying street network. TMPO/TRPA reported, in 2010, the region's daily bus transit operation miles were 3,640 miles, and the daily total transit vehicle service was 409 hours.

The ABM identifies the transit routes or paths in the network that have the least time and cost for the traveler by determining the shortest path between zones. The model estimates these "skims" separately for walk-to-transit and drive-to-transit modes. For the walk-to-transit mode, the model assumes a person walks from his/her origin zone to the closest bus stop; for drive-to-transit mode, the model assumes a person accesses transit by driving to a bus stop, often using a park-and-ride lot. The model also assumes that access from the bus stop to the destination zone is always made by walking.

TMPO/TRPA followed acceptable practice for modeling the transit network, and the region's methodology is consistent with the procedures discussed in the "NCHRP Report 365" and the USDOT-FHWA Manual.

Non-Motorized Transportation Facility

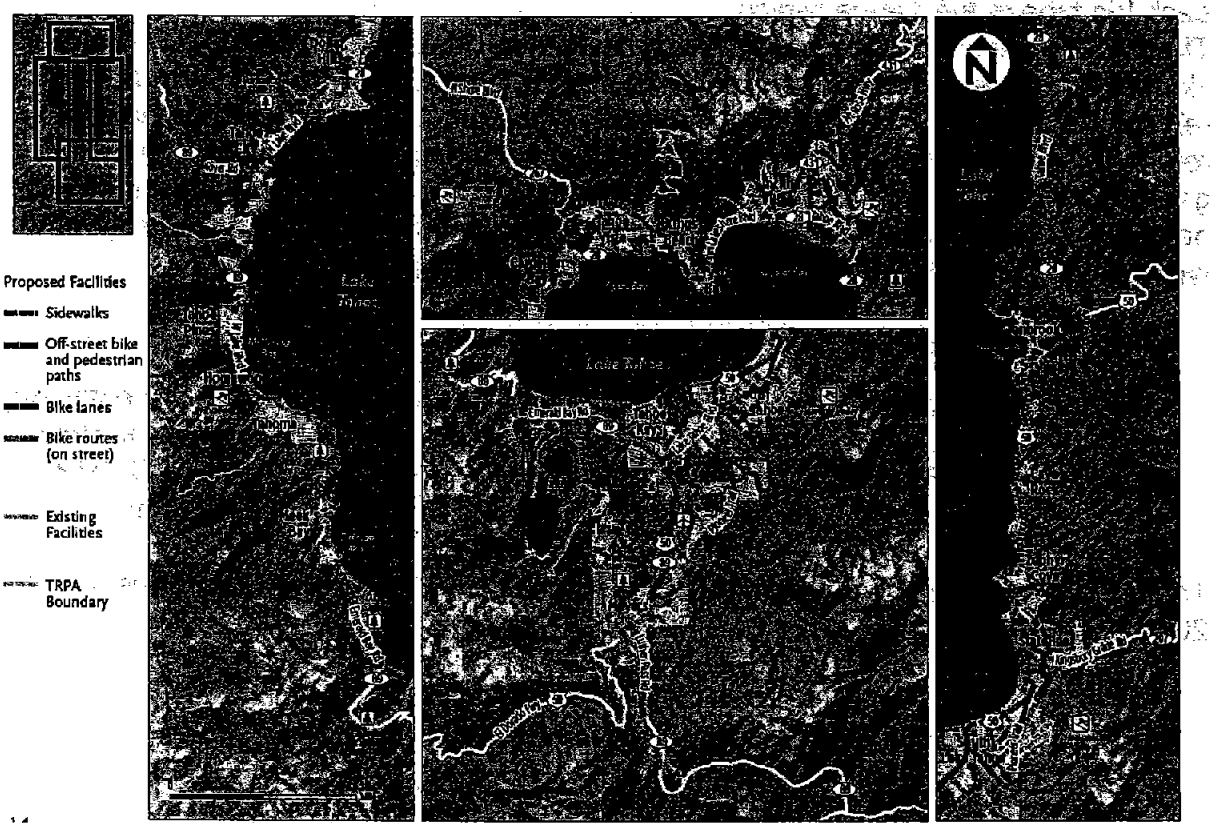
For non-motorized mode trips, the ABM assumes a walk speed of 3 miles per hour in estimating the travel cost and time associated with walking. Table 8 presents the base year (2010) non-motorized facility lane miles assumed by the model.

Table 8: California-Specific Non-motorized Facility Lane Miles

Non-Motorized Functional Class	California-specific Lane Miles (2010)
Bike path[10]	31
Bike lane[11]	17

Figure 5 presents the existing and proposed non-motorized transportation facility coverage in the Tahoe region. The definitions of bike path and bike lane are consistent with those given in the "Highway Design Manual" by Caltrans.

Figure 5: Existing and Proposed Bicycle and Pedestrian Facilities



[10] Bike paths provide a completely separated right of way for the exclusive use of bicycles and pedestrians, with cross-flow by motorists minimized.
[11] Bike lanes provide a lane for one-way bike travel on a street or highway, which is separated from autos with road striping.

Travel Demand Inputs and Assumptions

Assumptions related to the number of vehicle trips and trip lengths influence a travel demand model's prediction of the amount of travel occurring in a region. ARB staff reviewed the inputs and assumptions used in the TMPO/TRPA model related to factors that influence the amount of regional travel and travel modes. Specifically, ARB staff compared vehicle trip rate and trip length inputs to independent data sources.

Trip Generation Rates

Vehicle trip factors are used in a transportation model to gauge what influences the amount of travel in a region and why the travel is generated. These factors include automobile ownership, income, household size, density and type of employment, the availability of public transportation, and the quality of the transportation system. Trip generation inputs to the model are used to reflect the average daily person trips for each trip type in the Tahoe region.
TMPO/TRPA estimates trip generation rates based on data from the 2000 TMPO/TRPA Household Survey. The model then estimates trips as "activity tours." A tour represents all of the daily activities and travel a person conducts between leaving and returning home, including trips for work, school, shopping, and recreation. The ABM groups tours into either mandatory or non-mandatory tours. Mandatory tours include home-based work or home-based school trips. Non-mandatory tours include all other types of tour purposes, for example, social or recreational trips.

Trip Length Distribution

In the traffic assignment step of the travel demand model, trip lengths are estimated using the street network and are used as inputs to calculate zone-to-zone travel impedances. To check the reasonableness of trip length inputs, TMPO/TRPA compared base year modal trip length data to the 2009 NHTS data.

Table 9 summarizes the average reported trip length inputs and the comparison to the 2009 NHTS data.

Table 9: Region Average Reported Trip Length by Mode

Mode	Average Trip Length (miles)	
	TMPO/TRPA (2010)	NHTS (2009)
Auto	18.69	12.09
Walk	1.8	0.98
Bike	2.4	N/A

TMPO/TRPA's trip length for auto trips and walk trips are, on average, greater than what is reported for the nation as a whole. The greater distance in auto trips may arise from the unique commute pattern of the bi-state nature of the Tahoe Region;

commuters who reside on the California side of the region could drive to the Nevada side for employment at the casinos.

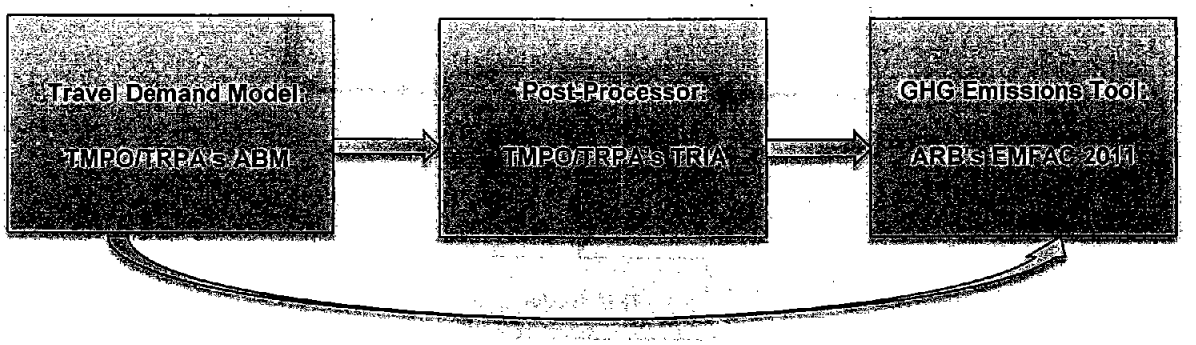
MODELING TOOLS

ARB staff used its evaluation methodology to review TMPO/TRPA's use of modeling tools to quantify GHG emissions in the SCS.

TMPO/TRPA utilizes three modeling tools to quantify GHG emissions that would result from the implementation of their RTP/SCS (Figure 6): the TMPO/TRPA Activity-Based Travel Demand Model, the Trip Reduction Impact Analysis Tool (TRIA), and ARB's vehicle emission model EMFAC 2011.

TMPO/TRPA used the ABM to estimate regional travel demand based on modeling inputs such as base year population, employment, and planning assumptions about future year land use, housing, and the transportation network. The main outputs of this travel demand model are VMT, vehicle hours traveled (VHT), number of vehicle trips, and average speed.

Figure 6: TMPO/TRPA's Modeling Tools

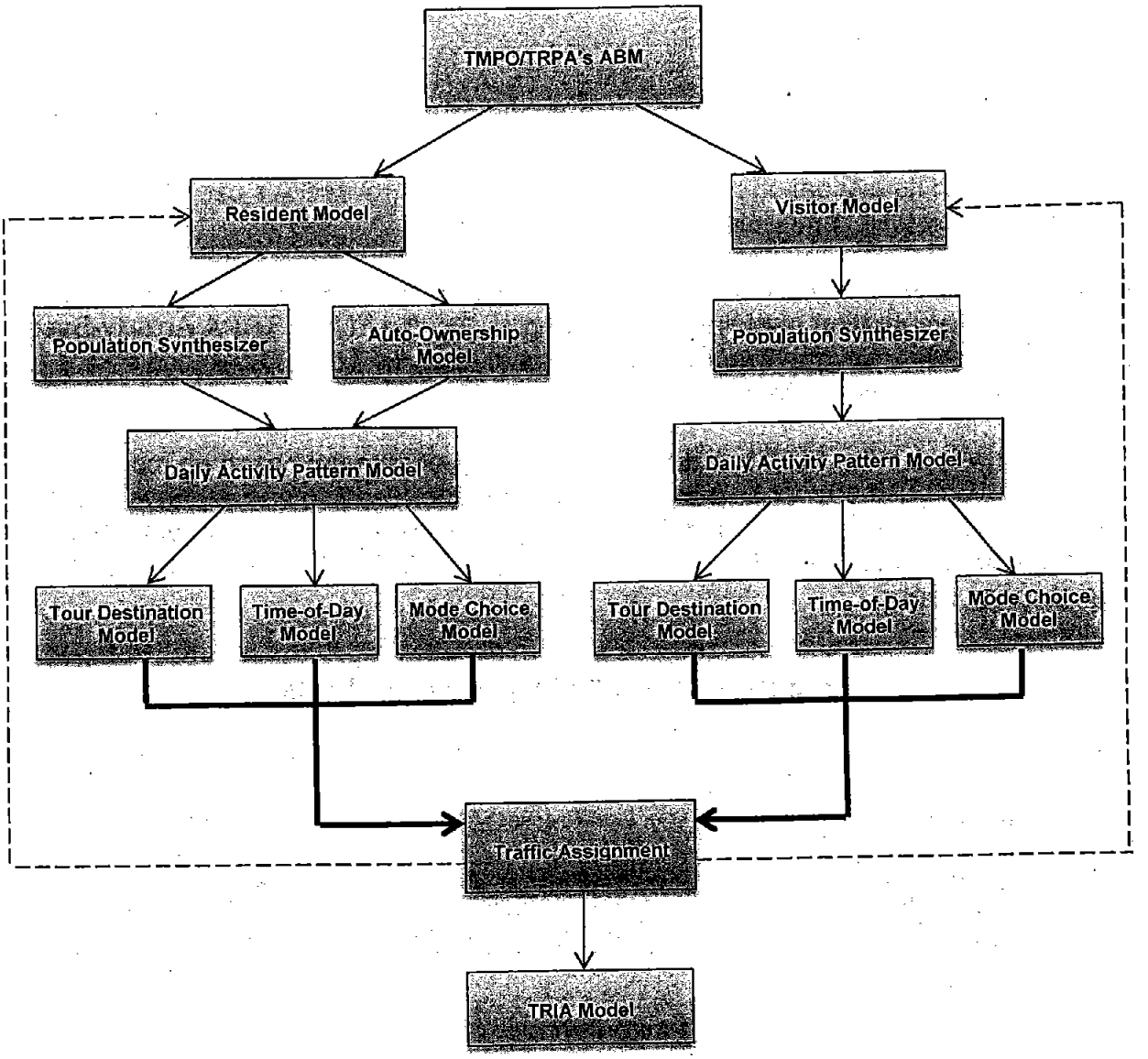


To estimate the percent reduction in vehicle trips from implementation of its RTP/SCS for 2020 and 2035, VMT and number of vehicle trips from the travel demand model is input into the post-processor, the TRIA model. VMT and speed outputs from the post-processor and the travel demand model is then converted to CO_2 emissions using EMFAC 2011.

Activity-Based Travel Demand Model

TMPO/TRPA developed an input file for the travel demand model that includes zonal level geographic, demographic, and socio-economic data for the region. Zonal variables in the socio-economic file include characteristics that help drive transportation and housing choices, e.g., an attractiveness index, urban type, accessibility index, employed residents, socio-economic characteristics, visitor capacity, and occupancy rates.

Figure 7: Structure of the Activity-Based Travel Demand Model



The structure of the travel demand model is based on the concept of an activity-based model originally developed for Columbus, Ohio. TMPO/TRPA's ABM components consist of an activity-based resident model and an activity-based visitor model (Figure 7) that use a population synthesizer and auto ownership model; a daily activity pattern model to choose a full day activity pattern for each person in the region; and aggregate trips generated from both the resident and visitor models. Trips are then assigned to the street network. TMPO/TRPA performed ten runs of the ABM and analyzed the convergence of the traffic assignment results. TMPO/TRPA then used the results of the three surveys that were conducted in 2006 to calibrate the ABM: the Tahoe Resident Survey, Overnight Visitor Survey, and Second Home Owner Survey.

Population Synthesizer

TMPO/TRPA also used the information from the socio-economic file as inputs to the population synthesizer to create a synthetic population that matches household level and person level characteristics in the region. The specific zonal characteristics that TMPO/TRPA considered are the average number of workers in a household per zone, average household size, and number of households per income group.

To develop the synthetic population, TMPO/TRPA set up a 3-dimensional table for each zone: number of households by size, number of workers, and income. TMPO/TRPA also used the Public Use Micro-Sample Area (PUMA) to obtain household records. The synthesizer then randomly drew zones in the region to match the given category until all of the households were assigned.

Auto-Ownership Model

TMPO/TRPA created the auto-ownership model to estimate the availability of automobiles per household in the region. The five types of auto-ownership assumed in this model are: no autos, one auto, two autos, three autos, and four or more autos. The availability of autos for a household was used as a key parameter in the auto-ownership model.

For validation, TMPO/TRPA matched the auto-ownership model outputs to observations from the 1,220 surveyed households in the region. It then applied expansion factors to represent the entire population of 22,361 households from the Census Transportation Planning Package 2000 (CTPP 2000).

Table 10: Modeled Household Auto-Ownership and Census Results

Auto(s) Owned	CTPP 2000	Model Results
0	1,462	1,232
1	5,937	6,170
2	9,067	8,608
3	4,166	4,187
4+	1,729	2,164
Total	22,361	22,361

Table 10 compares modeled household auto-ownership results to observations based on the Census Transportation Planning Package 2000 (CTPP 2000).

Daily Activity Pattern Model

The Daily Activity Pattern (DAP) Model simulates a full day activity, travel schedule, and mode choice for each person from the modeled synthetic population in the region. The DAP model consists of three sub-models or components: a tour destination, time-of-day, and mode choice.

The three main pattern categories in the DAP model are: mandatory pattern for work or school, non-mandatory pattern for maintenance and discretionary tours, and at-home pattern for accounting only in-home activities. Parameters considered in the DAP model include age, ability to drive, and employment. Also, the DAP model captured most intra-household interaction in their daily activities. TMPO/TRPA validated model results with the observed daily activity patterns from household surveys.

Tour Destination

The first component of the DAP model is the tour destination model, which is used to determine where a tour will go. The destination model is a multinomial logit model that treats each potential destination zone as an alternative. Modeling parameters considered in the destination model include travel distance, income level, area type, attractiveness of a zone, and accessibility.

The destination model has four sub-models to account for different tour purposes and residential status: mandatory tour destination, joint tour destination, non-mandatory tour destination, and visitor tour destination. As a calibration process of the destination model, TMPO/TRPA compared model results of county to county flows, tour distance, and internal to external flows with the observed data from the household travel survey.

Table 11 summarizes the comparison between modeled travel distance and time and observed values from the household travel survey for the mandatory tours.

Table 11: Modeled and Observed Travel Distance and Travel Time

Trip Type	Travel Distance		Travel Time	
	Household Travel Survey	Model Result	Household Travel Survey	Model Result
Mandatory Work Trips	4.1 to 4.6	4.2 to 4.6	7.9 to 8.7	7.9 to 8.6
Mandatory School Trips	2.8 to 3.6	2.7 to 4.2	5.6 to 7.1	5.4 to 7.6

Time-of-Day

The second component of the DAP model is the time-of-day model (TOD model). The TOD model is a multinomial logit model for estimating the start and stop hour pairs for each of the alternative daily activity patterns. TMPO/TRPA calibrated the estimates of start time, end time, and duration of the tour from the TOD model with observations from the household travel survey.

Mode Choice

The third component of the DAP model is the mode choice model. The mode choice model is also a multinomial logit model. Given a tour purpose, each available mode of transportation is considered as an alternative mode choice. For example, for the mandatory tours, there are six available modes: drive-alone; shared auto; walk to transit; drive to transit; non-motorized; and school bus.

The mode choice model compares across alternatives based on travel time. For an alternative that is associated with a cost, such as bus fare for taking transit or the vehicle operating cost for driving, the cost is converted into a time factor. TMPO/TRPA calibrated the mode choice model with data from its household travel survey (Table 12).

The method used in developing the mode choice model is consistent with the approach used nationwide as cited in the National Cooperative Highway Research Program (NCHRP) Report 535.

Table 12: Range of Percent of Mode Share for Mandatory Tours

Mode	Model Result	Survey Result
Drive Alone	68 to 89%	68 to 88%
Share Ride	4 to 12%	4 to 13%
Drive to Transit	0 to 1%	0%
Walk to Transit	0 to 7%	0 to 7%
Non-Motorized	5 to 21%	5 to 22%

Traffic Assignment

After running the resident and visitor models, all of the person tours are converted into zone-to-zone trip tables that are assigned to the street network. TMPO/TRPA uses TransCAD transportation software to perform traffic assignment for each time of day period. The breakdown of time periods in the TMPO/TRPA ABM is shown in Table 13. Because there are very few trips of the transit and non-motorized modes, TMPO/TRPA only assigns the drive-alone and shared auto trips to the street network.

Table 13: Time Periods Used in Activity Based Model

Time Period	Start Time	End Time
AM Peak (AM)	7:00 AM	10:00 AM
Midday (MD)	10:00 AM	4:00 PM
PM Peak (PM)	4:00 PM	7:00 PM
Late Night (LN)	7:00 PM	7:00 AM

TMPO/TRPA uses the standard Bureau of Public Roads (BPR) volume-delay function (VDF) to estimate travel time, given the free-flow travel time, capacity, and assigned volume for each link in the street network. The coefficients used in the capacity sensitive assignment function were consistent with FHWA's guidelines. All inter-zonal trips are iteratively assigned to the shortest calculated path by time. For each iteration, TMPO/TRPA applies the Method of Successive Averages (MSA)[12] to update the link volumes. TMPO/TRPA uses convergence criteria of 0.0001 during model development. A maximum of 50 iterations was found to reach convergence.

Table 14 presents a comparison between the assigned traffic volume to the transportation network and the observed data.

Table 14: Regional Assigned Traffic Volume and Traffic Counts

Trip Type	Assigned Volume	External Station Counts
Summer - Travel into Region	33,691	33,663
Summer - Travel out of Region	33,691	33,576
Winter - Travel into Region	26,813	26,752
Winter - Travel out of Region	26,813	26,663

Model Validation and Model Improvement

The last step of model development is model validation, which adjusts model results to reflect traffic count observations. The 2010 CTC's RTP guidelines recommend both static[13] and dynamic[14] tests for model validation to be performed for a region the size of the TMPO region (see Appendix A for more details). TMPO/TRPA established internal and external traffic count stations at 24 selected roadway segments covering both the

[12] The Method of successive averages is a common mathematical approach for finding convergence in link volume estimation process between iterations.
[13] Static validation tests compare the model's prediction of traffic volumes against existing traffic counts.
[14] Dynamic validation tests evaluate the model's response to changes in land use and transportation system assumptions.

California and Nevada sides of the Tahoe Basin for base year (2010) static model validation.

Table 15 presents the model validation results for external-internal and internal-external trips based on summer external station counts. All of the TMPO/TRPA's model results meet the criteria for acceptance given in the CTC's RTP guidelines.

Table 15: Base Year Static Model Validation Results

Validation Item	TMPO/TRPA's Model Result	CTC's RTP Guideline Criteria for Acceptance
Percent of Links within Allowable Deviation	75%	≥75%
Correlation Coefficient	0.93	≥0.88
Percent Root Mean Squared Error (% RMSE)	23%	≤40%

Note: The deviation is the difference between the model volume and the actual count divided by the actual count. This is an indication of the correlation between the actual traffic counts and the estimated traffic volumes from the model. RMSE is the square root of the model volume minus the actual count squared divided by the number of the counts.

TMPO/TRPA also performed eight dynamic validation tests to examine the responsiveness of the model to land use changes within and outside of the pedestrian-transit oriented development (PTOD) areas. The model responses to changes in VMT or vehicle trips with respect to changes in land use are reasonable in these dynamic validation tests.

The in-use day visitor survey does not indicate which external station the travel party used to enter the region, or whether a travel party did activities together. TMPO/TRPA staff states future modeling enhancement will focus on visitor travel survey improvement.

As described in previous sections of this report, TMPO/TRPA's preferred scenario, Alternative 3 / Strategy C combination, proposes low development and highly incentivized redevelopment. Land use and demographic data inputs and assumptions associated with the preferred scenario were input to the activity-based travel demand model to estimate VMT of base and forecasted years. Main data inputs are the region's household, employment, and population information.

Using the ABM alone, the resulting VMT estimates for year 2020 and 2035 demonstrate a corresponding 9 percent and 3 percent per capita CO_2 emissions reduction relative to that of the base year (2005), respectively. TMPO/TRPA staff indicates that most of the projects that are proposed in their 2035 RTP/SCS will be implemented between 2010 and 2020. Therefore, the intermediate percent of CO_2 emissions reduction by 2020

reflects the distribution of the implementation of projects towards early years of the 2010 to 2035 time frame.

Post-Processor Model

The TRIA model, a post-processing tool, was developed by TMPO/TRPA to evaluate trip reduction impacts associated with the RTP/SCS strategies that were not captured by the ABM. These strategies include parking management, transportation demand management, transit service and facilities improvement, and bike and pedestrian facilities improvement.

The TRIA model uses base year (2005) conditions in the Tahoe region, and forecasts for target years 2020 and 2035. The trip reduction impacts of the selected SCS strategies are derived from region specific standards such as the TRPA Code of Ordinances, the Tahoe Regional Transit System Plan Study, as well as empirical studies conducted elsewhere e.g., the Transit User Surveys in Brussels, Belgium, and Valuing Transit Service Quality Improvements by the Victoria Transport Policy Institute. Where there is variation regarding the effectiveness of a strategy, TMPO/TRPA assumes the more conservative end of the range. Therefore, the potential reduction in VMT may be under-estimated. For consistency purposes, ARB staff reviewed and compared the claimed percent reduction associated with each of the policies used in the TRIA model with available empirical literature findings.

Parking Management

The parking management strategy in the SCS is based in part on the reduction or elimination of minimum parking standards, creation of maximum parking standards, shared parking, and alternative payment methods for parking. TMPO/TRPA estimated vehicle trip reduction associated with parking management policy based on vehicle trip generation rates, projected public and private parking spaces, the number of occupied housing units, household vehicle ownership, and residential occupancy rates. These data were derived from the American Community Survey 2009 (ACS 2009) and the 2000 U.S. Census data.

TRPA/TMPO estimates that parking management would reduce the generation of work trips and discretionary trips from new development by 0.4 percent and 0.9 percent in 2020 and 2035, respectively. The parking management strategy also applies demand-responsive pricing to on-street parking spaces in commercial areas. However, because of relatively few on-street parking spaces currently in commercial areas TMPO/TRPA does not expect significant reductions in vehicle trips for either existing or new developments.

TMPO/TRPA's assumptions and inputs used in the estimation of vehicle trip reduction are reasonable and consistent with observed data from U.S. Census.

Transportation Demand Management (TDM)

The transportation demand management strategy calls for improving existing employer vehicle trip reduction programs, which include carpool and vanpool matching programs, employee shuttles, on-site secure bicycle storage and shower facilities, flexible work hours, and park-and-ride incentives. This estimate was based on calculating the percent of CO_2 emissions reduction associated with the TDM strategy based on rideshare information and the current[15] and target participation rates for small, medium, and large business firms. The TRIA model assumed target participation rates of 75 percent, 90 percent, and 100 percent for small, medium, and large companies, respectively. TMPO/TRPA estimated that TDM strategies can reduce peak-hour commuter trips by 1.8 percent for existing development and 1.5 percent in new development for both years 2020 and 2035.

ARB staff reviewed key model inputs for the CO_2 emission reduction from the TDM. The model inputs and assumptions are consistent with the TRPA Code of Ordinances[16].

Transit Service and Facilities

TMPO/TRPA projected transit ridership for 2020 and 2035 based on the 2005 Tahoe Area Regional Transit Systems Plan Study and the 2006 Tahoe Interregional/ Intraregional Transit Study. Public transit (i.e. bus) shares about one percent of the total number of trips in 2005. TMPO/TRPA assumes that 95 percent of the forecasted ridership would be from existing single-occupancy-vehicle (SOV) trips.

The transit service and facilities strategy used in the TRIA model considers capital investment or improvement such as intra-regional transit capital projects, transit operational changes, transit coordination improvements on trip planning, real-time arrival information, and transit coordination improvements on wait time and ticketing structure.

TMPO/TRPA expects the transit strategy will increase transit mode share for both work related and discretionary trips. The percent CO_2 emissions reduction estimation is based on the new transit trips and the forecast total number of trips in 2020 and 2035.

Table 16 lists the expected percent reduction associated with each policy. Modeling assumptions for this strategy were reviewed, and found to be consistent with the referenced case studies.

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[15] Current participation rates of the employer vehicle trip reduction program are 30%, 50%, and 80% for small, medium, and large companies, respectively.

[16] The TRPA Code of Ordinances is designed to implement the goals and policies in a manner attaining and maintaining the environment thresholds for the Lake Tahoe region.

Table 16: Assumption on the Transit Service and Facility Strategy

Transit Service and Facility Policy	Percent Reduction in Vehicle Trips	
	2020	2035
Intra-Regional Transit Capital Projects	0.54%	0.50%
Transit Operational Changes	0.82%	0.80%
Transit Coordination Improvement: Trip Planning	1.00%	1.00%
Real-Time Arrival Information	0.50%	0.50%
Transit Coordination Improvement: Wait time and Ticketing Structure	0.09%	0.10%

Bike and Pedestrian Facilities Improvement

TMPO/TRPA estimated bicycle and pedestrian trips based on their 2009 Bicycle Trail User Model. The bike and pedestrian facility strategy intends to complete the bike and pedestrian facility network throughout the Tahoe region. In addition, the SCS includes a snow removal program for important bike and pedestrian routes near the Tahoe Town Centers to keep routes clear during the winter season. TMPO/TRPA expects this strategy can increase bike and pedestrian mode share in the project areas with the reduction mainly drawn from the existing short-distance (3 miles or less) vehicle trips for work and discretionary trip purposes.

Table 17 summarizes the assumed reduction from this strategy. The methodology used in estimating the percent vehicle trip reduction associated with this strategy was reviewed, and found to be appropriate.

Table 17: Assumption on the Bike and Pedestrian Strategy

Bike and Pedestrian Facility Policy	Percent Reduction in Vehicle Trips	
	2020	2035
Complete Region-wide Bike and Pedestrian Network	0.3-0.4%	0.6-0.9%
Snow Removal on Important Bike and Pedestrian Routes	0.05-0.07%	0.1-0.2%

EMFAC Model

ARB's Emission Factor model (EMFAC2011) is a California-specific computer model which calculates weekday emissions of air pollutants from all on-road motor vehicles including passenger cars, trucks, and buses for calendar years 1990 to 2035. The model estimates exhaust and evaporative hydrocarbons, carbon monoxide, oxides of nitrogen, particulate matter, oxides of sulfur, methane, and CO_2 emissions. It uses vehicle activity provided by regional transportation planning agencies, and emission

rates developed from testing of in-use vehicles. The model estimates emissions at the statewide, county, air district, and air basin levels.

The EMFAC2011 modeling package contains three components: EMFAC2011-LDV for light-duty vehicles, EMFAC2011-HD for heavy-duty vehicles, and EMFAC2011-SG for future growth scenarios. To estimate per capita CO_2 emissions, TMPO/TRPA estimated total VMT and speed profiles for the California portion of the region and applied them to the EMFAC2011-SG model. EMFAC2011-SG uses the inventory from EMFAC2011-LDV and EMFAC2011-HD modules and scales the emissions based on changes in total VMT, VMT distribution by vehicle class, and speed distribution. TMPO/TRPA then divided the estimated CO_2 emissions by the year 2005, 2020, and 2035 residential populations to obtain CO_2 emissions per capita.

Overall Adjustment Impacts

TMPO/TRPA considers the preferred alternative (Alternative 3/Strategy C) to be a moderate level of deployment for the combined implementation of the parking management, TDM, transit service improvement, and bike and pedestrian facility improvement strategies.

TMPO/TRPA applied the forecasted land use and population growth data inputs associated with the preferred scenario alone to the activity-based travel demand model. The outputs of this analysis show a 9 percent and 3 percent per capita CO_2 emissions reduction by 2020 and 2035 respectively, compared to that of 2005. For its RTP/SCS, TMPO/TRPA staff also used the TRIA model to analyze the CO_2 emissions reduction impacts associated with different level of deployment for the combined implementation of strategies that are not reflected in the ABM.

Outputs of the TRIA model indicate the implementation of these strategies can contribute an additional 3 percent and 4 percent per capita CO_2 emissions reduction by 2020 and 2035 respectively, compared to that of 2005. Together, the application of the activity-based travel demand model and the TRIA model to Alternative 3/Strategy C results in a 12 percent and 7 percent per capita CO_2 emissions reduction by 2020 and 2035, respectively.

PERFORMANCE INDICATORS

Because of the unique characteristics of the Tahoe region, ARB staff focused on two key performance indicators, residential density and VMT. ARB staff reviewed the directional consistency of the indicators with TMPO/TRPA's modeled GHG emissions reductions, as well as the general relationships between those indicators and GHG emissions identified in the empirical literature. This assessment relies on key empirical studies for each indicator that illustrate qualitatively how changes can increase or decrease VMT and/or GHG emissions. Below is a summary of ARB staff's evaluation for the land use and transportation-related performance indicators.

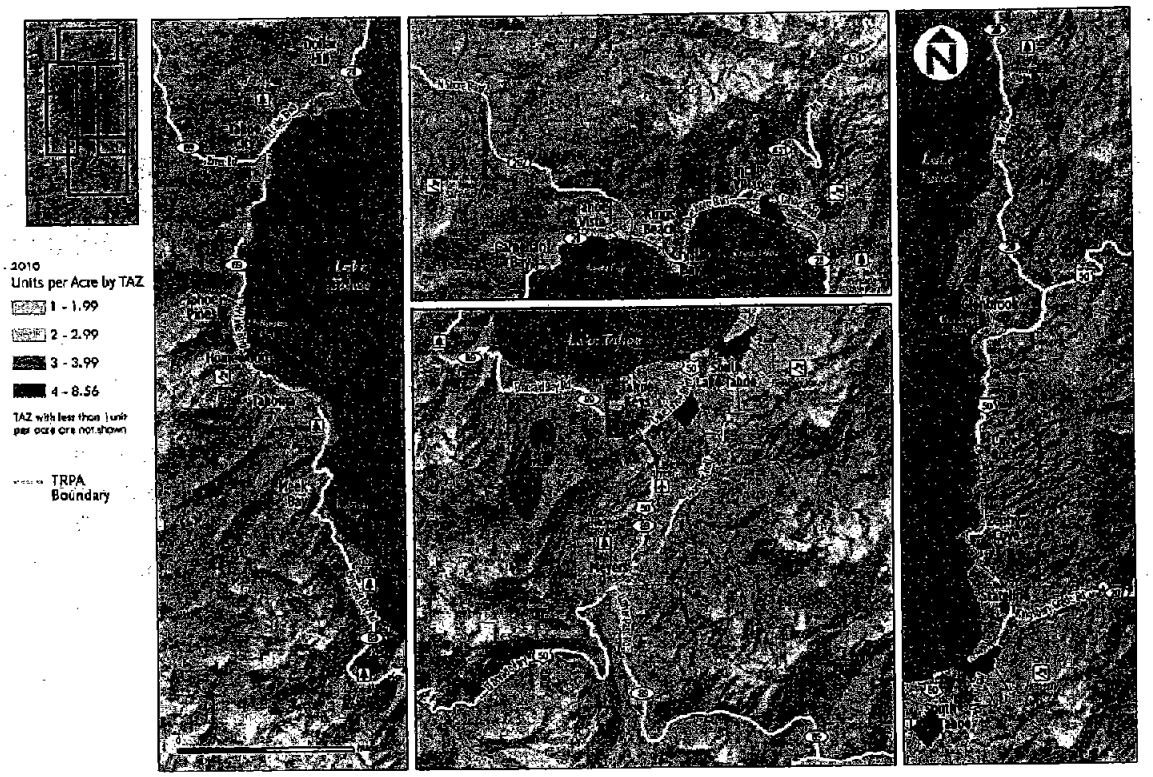
Land Use Indicators

ARB staff's review focused on residential density to evaluate changes in passenger vehicle GHG emissions reductions from development patterns assumed in the preferred alternative scenario.

Residential density is a measure of the average number of dwelling units per acre of developed land. TMPO/TRPA anticipate a change in travel characteristics in the region as the housing market shifts from single unit homes on larger lots, to single unit homes on smaller lots, townhomes, and multi-family housing. These changes in travel behavior include reductions in average trip length, and could eventually result in decreased regional VMT.

A review of relevant empirical literature supports the TMPO/TRPA finding that decreased regional VMT should result from increased residential density. Brownstone and Golob analyzed National Household Travel Survey (NHTS) data and observed that denser housing development significantly reduces annual vehicle mileage and fuel consumption, which directly results in the reduction in GHG emissions. They also reported that households in areas with 1,000 or more units per square mile drive 1,171 fewer miles and consume 64.7 fewer gallons of fuel than households in less dense areas. Boarnet and Handy (2010) reported that doubling residential density reduces VMT an average of 5 to 12 percent. Litman (2012) reported that increased population density leads to a decrease in the demand for car travel.

Figure 8: Existing Distribution of Residential Development, 2010

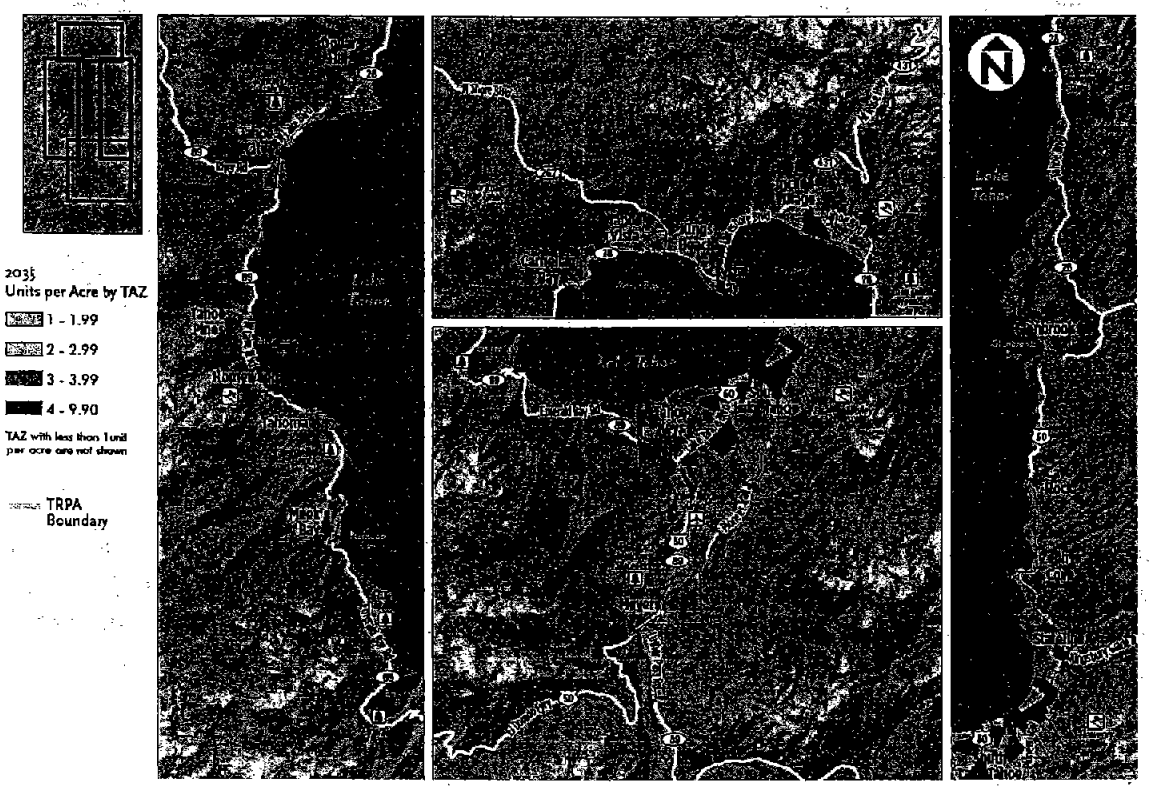


The Tahoe region currently contains 47,000 dwelling units. Roughly 31,000 are single-family homes on medium-sized lots ranging from 1/8 to 1/4 acre. Figure 8 shows the existing distribution of Tahoe's residential development.

The RTP/SCS indicates that the number of housing units will rise, especially multi-family housing in town centers, thus increasing residential density. Tahoe's preferred land use alternative (Alternative 3 linked to Transportation Strategy C) would result in the highest level of redevelopment activity, with somewhat higher densities in community centers.

Of the five alternatives evaluated, the preferred land use alternative calls for the highest level of environmental restrictions on development, removal of existing development, and transfer of development rights from sensitive lands and lands distant from the community centers. Figure 9 shows the projected distribution of new residential development in the Tahoe region in 2035.

Figure 9: Forecast Distribution of Residential Development, 2035

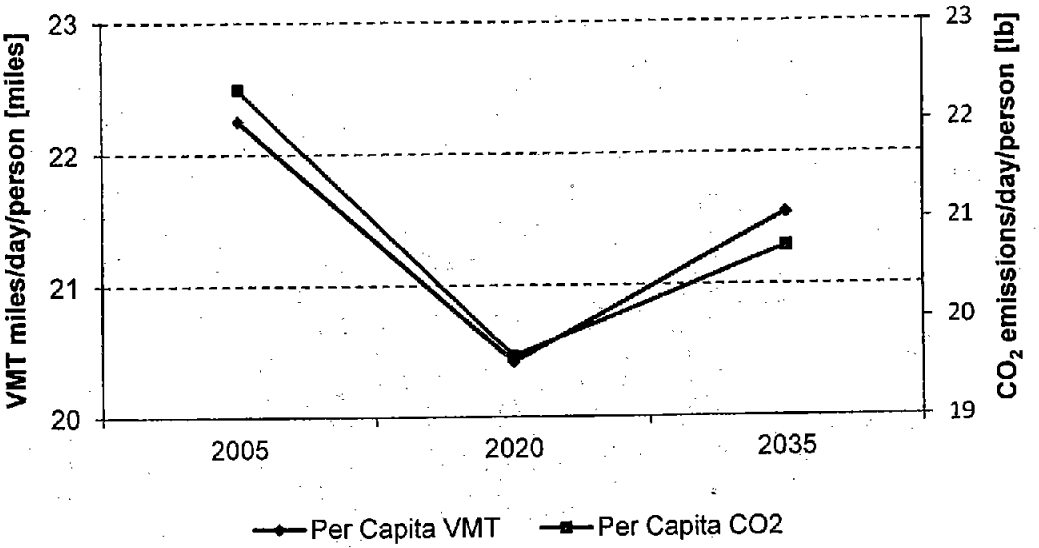


The empirical literature supports the finding that increased density will likely result in reductions in VMT and auto trip length, shifts in travel mode away from single occupancy vehicles, and associated reductions in GHG emissions.

Transportation-Related Indicators

Passenger VMT was evaluated as a transportation-related performance indicator of the TMPO/TRPA activity-based travel demand model. The weekday per capita passenger vehicle VMT for 2005, 2020, and 2035 is illustrated in Figure 10 below. TMPO/TRPA staff indicates that the large reduction in both per capita weekday VMT and CO_2 emissions between years 2005 and 2020 reflect most of the proposed projects included in their 2035 RTP/SCS will be implemented by 2020. Development in 2005 in the TMPO/TRPA region was greater than in 2012. Therefore, the loss in tourist accommodations units (TAUs) after the 2005 peak development period contributes to the rapid reduction in per capita CO_2 emission between 2005 and 2020.

Figure 10: Weekday Per Capita Passenger Vehicle VMT and CO_2



The estimation of CO_2 emissions from passenger vehicles is based on VMT and vehicle travel speeds. The base year and forecasted VMT of TMPO/TRPA are directionally consistent with the corresponding reported CO_2 emissions reduction trend between 2005 and 2035 in their RTP/SCS.

CONCLUSION

This report documents ARB staff's technical review of the plan together with its subsequent review of the adopted RTP/SCS. This review affirms that TMPO/TRPA's adopted SCS demonstrates that, if implemented, the region will achieve a 12.1 percent passenger vehicle greenhouse gas per capita reduction in 2020, and a 7.2 percent reduction in 2035. These reductions meet the targets established for TMPO/TRPA of 7 percent and 5 percent GHG per capita decrease from 2005 levels for the years 2020 and 2035, respectively.

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Appendix A: 2010 CTC RTP Guidelines Addressed in TMPO/TRPA's RTP

This Appendix describes the requirements in the CTC Guidelines that are applicable to the TMPO/TRPA regional travel demand model, as well as the recommendations that TMPO/TRPA incorporated into the model.

Requirements	1. Each MPO shall model a range of alternative scenarios in the RTP Environmental Impact Report based on the policy goals of the MPO and input from the public. 2. MPO models shall be capable of estimating future transportation demand at least 20 years into the future. (Title 23 CFR Part 450.322(a)) 3. For federal conformity purposes, each MPO shall model criteria pollutants from on-road vehicles as applicable. Emission projections shall be performed using modeling software approved by the EPA. (Title 40 CFR Part 93.111(a)) 4. Each MPO shall quantify the reduction in greenhouse gas emissions projected to be achieved by the SCS. (California Government Code Section 65080(b)(2)(G)) 5. The MPO, the state(s), and the public transportation operator(s) shall validate data utilized in preparing other existing modal plans for providing input to the regional transportation plan. In updating the RTP, the MPO shall base the update on the latest available estimates and assumptions for population, land use, travel, employment, congestion, and economic activity. The MPO shall approve RTP contents and supporting analyses produced by a transportation plan update. (Title 23 CFR Part 450.322(e)) 6. The metropolitan transportation plan shall include the projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan. (Title 23 CFR Part 450.322(f)(1))
Recommendations	1. The use of three-step models can continue for the next few years. The models should be run to a reasonable convergence towards equilibrium. 2. The models should account for the effects of land use characteristics on travel, either by incorporating effects into the model process or by post-processing. 3. During the development period of more sophisticated/detailed models, there may be a need to augment current models with other methods to achieve reasonable levels of sensitivity. Post-processing should be applied to adjust model outputs where the models lack capability, or are insensitive to a particular policy or factor.

	The most commonly referred to post-processor is a "D's" post-processor, but post-processors could be developed for other non-D factors and policies, too. 4. The models should address changes in regional demographic patterns. 5. Geographic Information System (GIS) capabilities should be developed in these counties, leading to simple land use models in a few years. 6. All natural resources data should be entered into the GIS. 7. Parcel data should be developed within a few years and an existing land use data layer created. 8. For the current RTP cycle (post last adoption), MPOs should use their current travel demand model for federal conformity purposes, and a suite of analytical tools, including but not limited to, travel demand models (as described in Categories B through E), small area modeling tools, and other generally accepted analytical methods for determining the emissions, VMT, and other performance factor impacts of sustainable communities strategies being considered pursuant to SB 375. 9. Measures of means of travel should include percentage share of all trips (work and non-work) made by all single occupant vehicle, multiple occupant vehicle, or carpool, transit, walking, and bicycling. 10. To the extent practical, travel demand models should be calibrated using the most recent observed data including household travel diaries, traffic counts, gas receipts, Highway Performance Monitoring System (HPMS), transit surveys, and passenger counts. 11. It is recommended that transportation agencies have an on-going model improvement program to focus on increasing model accuracy and policy sensitivity. This includes on-going data development and acquisition programs to support model calibration and validation activities. 12. For models with a mode choice step, if the travel demand model is unable to forecast bicycle and pedestrian trips, another means should be used to estimate those trips. 13. When the transit mode is modeled, speed and frequency, days, and hours of operation of service should be included as model inputs. 14. When the transit mode is modeled, the entire transit network within the region should be represented. 15. Agencies are encouraged to participate in the California Inter-Agency Modeling Forum. This venue provides an excellent opportunity to share ideas and help to ensure

	agencies are informed of current modeling trends and requirements. 16. MPOs should work closely with state and federal agencies to secure additional funds to research and implement the new land use and activity-based modeling methodologies. Additional research and development is required to bring these new modeling approaches into mainstream modeling practice.

Appendix B: Modeling Parameters for SCS Evaluation (Data Table)

This appendix contains TMPO/TRPA's responses to data requests, received on October 11, 2012, to supplement ARB staff's evaluation of TMPO/TRPA's quantification of GHG emissions. ARB requested this data in accordance with the general approach described in ARB's July 2011 evaluation methodology document (or the modified evaluation methodology document).

Modeling Parameters for Tahoe RTP Evaluation – Final 11/21/2012

Modeling Parameters[1]	2005 (if available)	2010 (base year)	2020 (Without Project)[2]	2020 (With Project)[3]	2035 (Without Project)[2]	2035 (With Project)[3]	Data Source
DEMOGRAPHIC							
Total population	R=55,232; CA=41,213	R= 54,473; CA=41,176	R=55,132: CA=41,709	R=58,049; CA=43,934	R=55,687; CA= 42,005	R=60,365; CA=45,468	RPU Draft EIS page 3.12-9, and TMPO Model
Group quarters population	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	
Total number of households	R=22,729; CA=16,960	R=22,417; CA=16,945	R=23,460; CA=17,749	R=24,701; CA=18,695	R=23,696; CA=17,874	R=25,687; CA=19,348	Total population divided by Persons per household, below
Persons per household	R=2.43	R=2.43	R= 2.35	R=2.35	R=2.35	R=2.35	U.S. Census, and TMPO Model
Auto ownership per household	R=1.9	Not available	Not available	Not available	Not available	Not available	2005 Tahoe Regional Household Travel Survey, p. i.
Total employees	R=26,800 CA=12,715	R=22,605; CA=11,354	R=22,735; CA= 11,594	R=23,143; CA= 12,034	R=23,393; CA=11,930	R=23,804; CA= 12,854	RPU Draft EIS page 3.12-10, and TMPO Model
Average unemployment rate (%) *(Not used in model)*		13.1%	Not applicable	Not applicable	Not applicable	Not applicable	Base Year = CA Employment Development Department of Labor Market Information Division and NV. Department of Employment Training and Rehabilitation. Unemployment not used in Model.
Average household income ($) *(Not used in model)*	R=$53,364 (2005 dollars)	R=$58,754 (2010 dollars)	Not applicable	Not applicable	Not applicable	Not applicable	U.S. Census
LAND USE							
Total housing/dwelling units	R=46,360: CA=33,897	R=47,392: CA=35,260	R=47,938: CA=35,543	R=50,412: CA= 37,809	R=48,352: CA=35,780	R=51,552: CA=38,921	RPU Draft EIS, page 3.12-10, and TMPO Model
Single family households	Not available	R=40,592	Not available	Not available	R=40,678	R=42,158	Single-family Households are equal to Total housing/dwelling units minus multi-family households from below.

[1] When reporting $ units, indicate whether they are current dollars, YOE (year of exchange), or other.
[2] This scenario excludes proposed projects in RTP/SCS for respective calendar year. In other words, do nothing.
[3] This scenario includes modeling of proposed projects in RTP/SCS for respective calendar year.
Note: R= Tahoe Region (including Nevada) CA= California Portion of Tahoe Region

Multi-family households	Not available	R=6,800 (2012, approximate)	Not available	Not available	R=7,674	R=9,394	2010 data multi-family households is based on a query on November 20, 2012 of the TRPA Parcel database joined to PARCEL_APO, for all parcels with Description, 'Multiple family dwelling (2-4 units)', 'Multiple family dwelling (5-10 units)' or 'Multiple family dwelling (10+ units)'. Summed the number of units in the "Units" field for all selected parcels. 2035 data is 2012 plus new Multi-Family Residential from Table 2 (p. H-3) in Appendix H, RPU Draft EIS.
Average density – dwelling units per acre. Note: Density only includes Single Family Residential Units	CA= 1.99	CA= 2.07	CA=2.09	CA=2.22	CA= 2.1	CA=2.29	Total Housing/Dwelling units (from above) divided by total acreage of the urban boundary for Lake Tahoe's California jurisdictions (17,011 acres), from TRPA GIS data, UrbanAreas shapefile, November 19, 2011.
Tourist Accommodation Units	R=12,959	R=12,399	R=12,741	R=12,741	R=12,741	R=12,741	RPU Draft EIS, page 3.2-17, and TMPO Model
Regional housing vacancy rate (%) *(modeled)*	Not available	45% vacant (includes units used seasonally and vacant)	45% vacant (includes units used seasonally and vacant)	45% vacant (includes units used seasonally and vacant)	45% vacant (includes units used seasonally and vacant)	45% vacant (includes units used seasonally and vacant)	2000 U.S. Census (2010 Census data was not available for vacancy rates at the time the 2010 base year was developed, so 2000 rates were used).
Total acreage developed	Not available (but similar to 2010)	R=7,936 (Hard coverage = 6,164 Soft coverage=1,771)	Not Calculated	Not Calculated	New acreage developed R=7 (commodities) + 28 (bike trails) = 35	New acreage developed R=66 (commodities) + 52 (bike trails) + 65 (temporary coverage and ADA) = 183	-2010 coverage from Table 3.2, page 3-23 of the Final RPU EIS (Revised Estimate of Total Area of Impervious Coverage, 1974 Bailey) -2035 Coverage estimates, page 3-139 of Final RPU EIS, and TRPA GIS layers

Total acreage available for new Development	Not available (but similar to 2010)	R=252	Not calculated	Not calculated	R=252	R=281	Derived from Tables 6 in Appendix H of the draft Regional Plan EIS (p. H-6) and Table C-2 of Appendix C of the Final RPU EIS (p. C-4, Alternative 1 and "Final Draft Plan"). Total acreage is: ([Total vacant private land available in each land capability district (Table 6)] x [Base allowable land coverage coefficients from Table 30.4.1-1 in the TRPA draft Code of Ordinances]) + (Allowable new coverage in community centers (Table C-2)).
Total housing units and tourist units within 1/4 mile of transit stations and stops	R=30,800	Not available	R=31,441	R=32,482	R=31,855	R=33,575	2005: -Source: TRPA GIS Analysis conducted in 2006, for the Pathway Evaluation Report, V1.1. Filename: overnightpopulation_access_standards_table.xls.shp; -2020 and 2035: Filename: future_trans_2035_quart_mile_Parcels_2012_int.shp -Plus new development allocations, filename: regional_plan_allocations_for_ascent_2012.03.02.xls.
New housing units and tourist units within 1/4 mile of transit stations and stops	Not applicable	Not applicable	R=802	R=1,843	R=1,216	R=2,936	New development allocations, filename: regional_plan_allocations_for_ascent_2012.03.02.xls.
Total housing and tourist units within 1/2 mile of transit stations and stops	Not available	Not available	Not available	Not available	Not available	Not available	
New housing and tourist units within 1/2 mile of transit stations and stops	Not applicable	Not applicable	R=802	R=1,843	R=1,216	R=2,936	New development allocations, filename: regional_plan_allocations_for_ascent_2012.03.02.xls.
Total employment (employees) within 1/4 mile of transit stations and stops	R=24,900	R=20,700	Not available	Not available	R=21,500	R=21,900	2005 Source: TRPA GIS data. Filename: transit_summer_2006_quart_mile_empl_int.shp, Column 2005_HH_25. 2010 Source: TRPA GIS data. Filename: transit_2006_quart_mile__2010_emp_int, Column 2010_Wo_47 2035 Source: Difference in payroll employees between 2035 and 2010, from Table 3.12-2, page 3.12-10 of the RPU Draft EIS.

New employment (employees) within 1/4 mile of transit stations and stops	Not applicable	Not available	Not available	Not available	R=800	R=1,200	Source: Difference in payroll employees between 2035 and 2010, from Table 3.12-2, page 3.12-10 of the RPU Draft EIS (all new employment expected to be in town centers)
Total employment (employees) within 1/2 mile of transit stations and stops	R=25,300	R=21,250	Not available	Not available	R=22,000	R=22,500	2005: Source: TRPA GIS data. Filename: transit_summer_2006_half_mile_empl_int.shp, Column 2005_HH_25. 2010: Filename: transit_2006_half_mile_buf_emp_2010_int.shp, Column 2010_Wo_47. 2035 Source: Difference in payroll employees between 2035 and 2010, from Table 3.12-2, page 3.12-10 of the RPU Draft EIS (all new employment expected to be in town centers).
New employment (employees) within 1/2 mile of transit stations and stops	Not applicable	Not available	Not available	Not available	R=800	R=1,200	Source: Difference in payroll employees between 2035 and 2010, from Table 3.12-2, page 3.12-10 of the RPU Draft EIS (all new employment expected to be in town centers).
TRANSPORTATION SYSTEM							
Freeway general purpose lanes — mixed flow(lane miles)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Freeway managed lanes—HOV, HOT, Tolled, etc. (lane miles)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Freeway auxiliary lanes (lane miles)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Freeway new ramps or widened ramps (lane miles)	Not applicable, no freeways	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Major Arterial / Expressway (lane miles)	Not applicable, All State Routes are coded as Minor Arterials	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Minor Arterial (lane miles)	R=110	R=110	R=110	R=110	R=110	R=110	TMPO Model
Collectors (lane miles)	R=155	R=155	R=155	R=155	R=155	R=155	TMPO Model
Locals (lane miles)	R=464	R=464	R=464	R=464	R=464	R=464	TMPO Model

Bus, operation miles (per day)	Not available	R=3,640	R=4,250	R=4,250	R=5,100	R=5,100	Tahoe Transportation District; South Shore Short Range Transit Plan.
Transit rail operation miles	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Transit total daily vehicle service hours	Not available	R= 409	R=460	R=460	R=520	R=520	Tahoe Transportation District; Short Range Transit Plan.
Bike Path miles	R= 33 (in 2003)	R= 43 CA=31	Not available	Not available	R=53 CA=37	R=62 CA=44	Lake Tahoe Regional Bicycle and Pedestrian Master Plan, 2003 Lake Tahoe Region Bicycle and Pedestrian Plan, 2010 2035: Draft 2012 RTP Constrained Project List; Also, "Prop_Bikeways_RPU_upd_2012.10.shp" plus Sawmill 2a and Lakeside Trails (constructed)
Bike Lane miles	R= 26 (in 2003)	R=21 CA=17	Not available	Not available	R=32 CA=28	R=32 CA=28	Lake Tahoe Regional Bicycle and Pedestrian Master Plan, 2003 Lake Tahoe Region Bicycle and Pedestrian Plan, 2010 2035: Draft 2012 RTP Constrained Project List; Also "Prop_Bikeways_RPU_upd_2012.10.shp" plus constructed Tahoe City to Kings Beach and Trout Creek to Ski Run Blvd. Bike Lanes.
Sidewalk miles	Not available	R=12 CA=6	Not available	Not available	R=13 CA=7	R=15 CA=8	Lake Tahoe Regional Bicycle and Pedestrian Master Plan, 2003 Lake Tahoe Region Bicycle and Pedestrian Plan, 2010 2035: Draft 2012 RTP Constrained Project List; Also "Prop_Bikeways_RPU_upd_2012.10.shp."
TRIP DATA (new)							
Number of Work Trips per day	Not available	R=22,502 Tours	R=24,621 Tours	R=25,273 Tours	R=25,112 Tours	R=26,721 Tours	TMPO Model.
Number of Shop Trips per day	Not available	R=8,911 Tours	R=10,102 Tours	R=10,812 Tours	R=10,489 Tours	R=11,453 Tours	TMPO Model.
Average Number of Trips/person per day by Mode	Household Survey = 9.61 Auto Trips per Household	Auto = 9.61	Auto= 9.71	Auto=9.70	Auto=9.63	Auto=9.62	2005 = Household Survey – Model Output
TOUR DATA							
Number of tours per day	Not available	R=108,265	R=109,432	R=110,588	R=110,867	R=112,409	TMPO Model

Primary destination	Not available	R=Work - 22,502	R=Work-24,621	R=Work-25,273	R=Work-25,112	R=Work-26,721	TMPO Model.
Secondary destination	Not available	Not available	Not available	Not available	Not available	Not available	
Number of stops in primary tour	Not available	R=7,726	R=7,987	R=8,421	R=8,124	R=8,845	TMPO Model.
Number of stops in secondary tour	Not available	Not available	Not available	Not available	Not available	Not available	
Tour distance	Not available	Resident = 11.7 Visitor = 22.5	Resident=11.5 Visitor=22.8	Resident=11.3 Visitor=22.6	Resident=11.5 Visitor=22.9	Resident=11.3 Visitor= 22.6	TMPO Model
Average auto trip length (miles)	Not available	R= 18.69	R=18.71	R=19.11	R=18.902	R=18.97	TMPO Model.
Average walk trip length (miles) *Not modeled*	R=1.8	R=1.8	R=1.8	R=1.8	R=1.8	R=1.8	TMPO Bicycle Trail User Model
Average bike trip length (miles) *Not modeled*	R=2.4	R=2.4	R=2.4	R=2.4	R=2.4	R=2.4	TMPO Bicycle Trail User Model
Average transit trip length (miles)	Not available	Not available	Not available	Not available	Not available	Not available	
Tour duration (minutes)	Not available	Not available	Not available	Not available	Not available	Not available	
Primary tour duration (minutes)	Not available	Not available	Not available	Not available	Not available	Not available	
Secondary tour duration (minutes)	Not available	Not available	Not available	Not available	Not available	Not available	
PERCENT TRIP MODE SHARE (whole day) Mode Share in the model is based on the 2006 Summer Travel Survey							
SOV/HOV	82%	81%	82%	82%	82%	82%	Travel Mode Share Surveys, Summer 2006 and 2010
Public transit (Bus)	1%	1%	1%	1%	1%	1%	Travel Mode Share Surveys, Summer 2006 and 2010
Public transit (Rail)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Non-motorized: Bike	4%	6%	4%	4%	4%	4%	Travel Mode Share Surveys, Summer 2006 and 2010
Non-motorized: Walk	12%	10%	12%	12%	12%	12%	Travel Mode Share Surveys, Summer 2006 and 2010
Other (includes paratransit, casino shuttle, private shuttle, ferry/boat, and taxi/limo)	1%	2%	1%	1%	1%	1%	Travel Mode Share Surveys, Summer 2006 and 2010

Additional Trip Reductions to the Mode Share listed above	Not applicable	Not applicable	Urban Centers: 2.3% Other Areas: 0.8% Internal-External: 0.8%	Urban Centers: 3.7% Other Areas: 1.7% Internal-External: 0.8%	Urban Centers: 2.7% Other Areas: 1.3% Internal-External: 0.8%	Urban Centers: 4.3% Other Areas: 2.2% Internal-External: 0.8%	TMPO Trip Reduction Impact Analysis (TRIA) model (see Appendix E, Part 2 (TRIA spreadsheets) of the RPU Draft EIS for trip reductions by mode).
PERCENT TRIP MODE SHARE (Peak period)							
SOV	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
HOV/HOT	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
Public transit (Bus)	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
Public transit (Rail)	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
Non-Motorized: Bike	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
Non-Motorized: Walk	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
AVG. TRAVEL SPEED (MPH)	Not available	R=25.87	R=25.85	R= 25.83	R=25.92	R=25.37	TMPO Model
VEHICLE MILES TRAVELED							
Total VMT per weekday for passenger vehicles (ARB vehicle classes of LDA, LDT1, LDT2 and MDV) (miles)	CA—850,203	CA- 760,129	2020 Alt 1 CA – 786,694	2020 Alt 3 CA – 783,512	2035 Alt 1 CA – 832,554	2035 Alt 3 CA – 856,151	TMPO Model and EMFAC Output Files from 3/26/2012
Total VMT per weekday for passenger vehicles (All vehicle classes) (miles)	CA – 949,750	CA- 909,181	CA- 928,908	CA-925,150	CA-989,899	CA-1,017,955	Appendix E, Part 4, RPU Draft EIS (Appendix C, Part 4, RTP Draft EIR/EIS)
Total II (Internal) VMT per weekday for passenger vehicles (All vehicle classes) (miles)	CA- 495,722	CA-466,838	CA-480,081	CA-474,780	CA-505,555	CA- 535,198	Appendix E, Part 4, RPU Draft EIS (Appendix C, Part 4, RTP Draft EIR/EIS)

Total* IX/XI VMT per weekday for passenger vehicles (All vehicle classes) (miles) (*50% of IX/XI VMT)	CA-454,028	CA-442,343	CA-448,828	CA-450,371	CA-484,344	CA-482,757	Appendix E, Part 4, RPU Draft EIS (Appendix C, Part 4, RTP Draft EIR/EIS)
Total XX VMT per weekday for passenger vehicles(All vehicle classes) (miles)	CA-548,271	CA-633,099	CA-638,240	CA-657,842	CA-666,848	CA-630,293	Appendix E, Part 4, RPU Draft EIS (Appendix C, Part 4, RTP Draft EIR/EIS)
CONGESTED TRAVEL MEASURES							
Congested weekday VMT on freeways (miles, V/C ratios >75)	No Freeways	No Freeways	No Freeways	No Freeways	No Freeways	No Freeways	No Freeways
Congested VMT on all other roadways (miles, V/C ratios >0.75)	Not available	R=415,969 CA=294,010	R=428,631 CA=300,041	R=455,757 CA=319,029	R=513,861 CA=359,840	R=517,016 CA=361,307	TMPO Model (pre-TRIA)
CO2 EMISSIONS[4]							
Total CO2 emissions per weekday for passenger vehicles (ARB vehicle classes LDA, LDT1, LDT2, and MDV) (tons)	CA= 437	Not applicable	CA=411	CA= 409	CA= 435	CA=447	EMFAC Output Files dated 3/26/2012
Total CO2 emissions per weekday for all vehicle classes	CA=551	Not applicable	CA=562	CA=559	CA=605	CA=622	EMFAC Output Files dated 3/26/2012
Total II (Internal) CO2 emissions per weekday for passenger vehicles (tons)	CA=288	Not applicable	CA=290	CA=287	CA=309	CA=327	Estimated based on proportion of II VMT from above
Total* IX / XI trip CO2 emissions per weekday for passenger vehicles (tons) (*50% of IX/XI CO2)	CA=263	Not applicable	CA=272	CA=272	CA=296	CA=295	Estimated based on proportion of IX-XI VMT from above
Total XX trip CO2 emissions per weekday for passenger vehicles (tons)	CA=318	Not applicable	CA=386	CA=397	CA=408	CA=385	Estimated based on proportion of XX VMT from above
INVESTMENT							
Total plan period investment ($)	Not applicable	Not applicable	$848,843,000	$1,078,000,000	$1,313,000,000	$1,592,000,000	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Highway capacity expansion ($)	Not applicable	Not applicable	0	0	0	0	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List

[4] Please provide ARB staff with the EMFAC Input and Output files associated with these outputs.

Other road ($) Note: Corridor Revitalization	Not applicable	Not applicable	$58,496,000 (to 2023)	$142,960,000 (to 2023)	$58,496,000 (2013-2035)	$142,960,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Transit capacity expansion ($) *Waterborne Transit only*	Not applicable	Not applicable	Capital: $43,900,000 Operations: $41,400,000 (2013- 2023)	Capital: $43,900,000 Operations: $41,400,000 (2013- 2023)	Capital: $43,900,000 Operations: $96,600,000 (2013-2035)	Capital: $43,900,000 Operations: $96,600,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Aviation capital ($)	Not applicable	Not applicable	0	0	$22,194,000 (2013-2035)	$22,194,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Bus transit capacity expansion ($)	Not applicable	Not applicable	0	$46,864,000 (2013- 2023)	0	$90,458,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Transit operations ($)	Not applicable	Not applicable	89,500,000 (2013-2023)	89,500,000 (2013-2023)	$212,047,000 (2013-2035)	$212,047,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Rail transit operations ($)	Not applicable	Not applicable	0	0	0	0	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Bike and pedestrian projects ($)	Not applicable	Not applicable	$32,469,000 (2013- 2023)	$75,278,500 (2013- 2023)	$32,469,000 (2013-2035)	$81,227,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Bike and pedestrian operations ($)	Not applicable	Not applicable	$6,234,000 (2013-2023)	$6,234,000 (2013-2023)	$14,778,000 (2013-2035)	$14,778,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Other ($) *Stormwater Strategies*	Not applicable	Not applicable	$384,467,000 (2013- 2023)	$437,072,000 (2013- 2023)	$384,467,000 (2013-2035)	$437,072,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Stormwater Treatment Facilities operations ($)	Not applicable	Not applicable	$22,473,000 (2013-2023)	$22,473,000 (2013-2023)	$53,271,000 (2013-2035)	$53,271,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
Other ($) Transportation System Management and Intelligent Transportation Systems	Not applicable	Not applicable	$10,468,000 (2013-2023)	$12,989,000 (2013-2023)	$10,893,000 (2013-2035)	$13,414,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List

Other Operations and Maintenance	Not applicable	Not applicable	$159,434,000 (2013-2023)	$159,434,000 (2013-2023)	$383,608,000 (2013-2035)	$383,608,000 (2013-2035)	Final Draft (October 24, 2012) 2012 RTP Constrained Scenario Project List
TRANSPORTATION USER COSTS AND PRICING							
Vehicle operating costs (cents per mile) *Not modeled*	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Gasoline price ($ per gallon) *Not modeled*	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Parking price ($ per day) *Not modeled*	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Toll price ($)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Congestion price ($ per mile) *Not modeled*	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
Average transit fare per passenger mile ($ per mile) *Not modeled*	Not applicable	BlueGo=$1.39 TART= $1.25 Not modeled	Not applicable	Not applicable	Not applicable	Not applicable	

PROPOSED

State of California
AIR RESOURCES BOARD

Acceptance of Greenhouse Gas Quantification Determination for the Tahoe Metropolitan Planning Organization's SB 375 Sustainable Communities Strategy

Resolution 13-16

April 25, 2013

Agenda Item No.: 13-5-2

WHEREAS, SB 375 (Steinberg, Chapter 728, Statutes of 2008), also known as the Sustainable Communities and Climate Protection Act, aims to reduce greenhouse gas (GHG) emissions from passenger vehicle travel through improved transportation and land use planning at the regional scale;

WHEREAS, SB 375 requires each of the State's 18 federally-designated Metropolitan Planning Organizations (MPO), including the California portion of the Tahoe Metropolitan Planning Organization, to develop a Sustainable Communities Strategy (SCS) or an Alternative Planning Strategy (APS) that meets the regional GHG emission reduction targets for passenger vehicles (targets) set by the Air Resources Board (ARB or Board);

WHEREAS, on September 23, 2010, the Board approved GHG emission reduction targets for 2020 and 2035, expressed as a per capita percentage reduction relative to 2005 levels, for each of the State's MPOs;

WHEREAS, the targets established for the Tahoe Metropolitan Planning Organization/Tahoe Regional Planning Agency (TMPO/TRPA) region call for a 7 percent reduction in per capita GHG emissions in 2020 and a 5 percent reduction in 2035 relative to 2005 levels;

WHEREAS, TMPO/TRPA staff engaged the public by holding two rounds of public workshops in November 2012;

WHEREAS, in August 2012, TMPO/TRPA published a draft Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for 2012-2035 that stated it would achieve more reductions than the region's GHG targets with a 12.1 percent per capita reduction from 2005 in 2020 and a 7.2 percent per capita reduction from 2005 in 2035;

WHEREAS, ARB staff performed a technical evaluation of the draft SCS using ARB's methodology, published in July 2011, for review of GHG emission calculation procedures for SCS plans;

WHEREAS, ARB staff's evaluation found that TMPO/TRPA used technical methodologies that would accurately quantify GHG reductions from the draft SCS;

WHEREAS, the TRPA Governing Board, acting as the TMPO, adopted the final RTP/SCS at its public meeting on December 12, 2012;

WHEREAS, as required by California Government Code section 65080(b)(2)(J)(ii), TMPO/TRPA submitted the final SCS to ARB on January 22, 2013 for review of its GHG quantification determination of a 12.1 percent per capita reduction by 2020 and a 7.2 percent per capita reduction by 2035;

WHEREAS, section 65080(b)(2)(J)(ii) of the California Government Code calls for ARB to accept or reject an MPO's determination that its submitted strategy would, if implemented, achieve the GHG emission reduction targets established by the Board;

WHEREAS, ARB staff's technical evaluation of TMPO/TRPA's GHG reduction quantification determination is contained in Attachment A, "Technical Evaluation of Greenhouse Gas Emission Reduction Quantification for the Tahoe Metropolitan Planning Organization/Tahoe Regional Planning Agency's Sustainable Communities Strategies," dated April 2013; and

WHEREAS, ARB staff's evaluation affirms that TMPO/TRPA's adopted 2012-2035 SCS would, if implemented, achieve more reductions than the GHG targets that the Board established for the region for 2020 and 2035.

NOW, THEREFORE, BE IT RESOLVED that pursuant to section 65080(b)(2)(J)(ii) of the California Government Code, the Board hereby accepts TMPO/TRPA's quantification of the GHG emission reductions from the final SCS adopted by the TMPO/TRPA Governing Board on December 12, 2012, and the MPO's determination that the SCS would, if implemented, achieve more reductions than the 2020 and 2035 GHG emission reduction targets established by ARB.

NOW, THEREFORE, IT IS ORDERED that ARB staff is directed to forward this Resolution to the TMPO/TRPA Governing Board and Executive Director.

Resolution 13-16

April 25, 2013

Identification of Attachment to the Board Resolution

Attachment A: "Technical Evaluation of Greenhouse Gas Emission Reduction Quantification for the Tahoe Metropolitan Planning Organization/Tahoe Regional Planning Agency's Sustainable Communities Strategies," April 2013.

TECHNICAL EVALUATION OF THE GREENHOUSE GAS EMISSION REDUCTION QUANTIFICATION FOR BUTTE COUNTY ASSOCIATION OF GOVERNMENTS' SB 375 SUSTAINABLE COMMUNITIES STRATEGY

April 2013

California Environmental Protection Agency

Air Resources Board

Electronic copies of this document can be found on ARB's website at http://www.arb.ca.gov/cc/sb375/sb375.htm.

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

I. BUTTE REGION 1

A. Background 1

B. Blueprint Planning and MTP/SCS 1

C. BCAG Land Use Alternatives 2

II. APPLICATION OF ARB STAFF REVIEW METHODOLOGY 5

A. Data Inputs and Assumptions 5

B. Modeling Tools 5

C. Performance Indicator 6

III. DATA INPUTS AND ASSUMPTIONS 6

A. Demographics and the Regional Growth Forecast 6

B. Current and Future Land Use Development Patterns 13

C. Transportation Network Inputs and Assumptions 17

D. Travel Demand Inputs and Assumptions 20

IV. MODELING TOOLS 22

A. Land Use Allocation Model 23

B. Travel Demand Model 23

C. EMFAC Model 26

V. LAND USE PERFORMANCE INDICATOR 27

VI. CONCLUSION 28

VII. REFERENCES 29

Appendix A: 2010 CTC RTP Guidelines Addressed in BCAG's MTP 31

Appendix B: Modeling Parameters for SCS Evaluation (Data Table) 33

LIST OF TABLES

Table 1: BCAG Description of Land Use Alternatives 2

Table 2: BCAG Growth Area Type Description 3

Table 3: BCAG Regional Growth Forecast 7

Table 4: Housing Allocation by Jurisdiction 9

Table 5: Population Growth Forecast 11

Table 6: Employment Growth Forecast by Growth Type 12

Table 7: Percent of Housing Units by Growth Type 17

Table 8: BCAG Base Year Network Lane Miles by Functional Class 19

Table 9: Reported BCAG Street Capacity 19

Table 10: BCAG Free-Flow Speed by Functional Class 20

Table 11: BCAG Transit and Non-Motorized Facility Lane Miles 20

Table 12: Average Vehicle Trip Rates per Household by Trip Purpose 21

Table 13: Average Auto Trip Length 22

Table 14: Production to Attraction Ratio by Trip Purpose 25

Table 15: Base Year Static Model Validation Results of the Daily Model 26

LIST OF FIGURES

Figure 1: BCAG Growth Area Types 4

Figure 2: Housing Projections (2010-2035) 8

Figure 3: Housing Growth Forecast 9

Figure 4: Population Growth Forecast 10

Figure 5: Regional Employment Growth Forecast 11

Figure 6: Current Land Uses 14

Figure 7: Current Land Use by Category (2010) 15

Figure 8: Street Network of BCAG 18

Figure 9: Flowchart of BCAG's Modeling Process 22

Figure 10: Flowchart of the Trip-Based Travel Demand Model 24

EXECUTIVE SUMMARY

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) calls for the California Air Resources Board (ARB or Board) to accept or reject the determination of each metropolitan planning organization (MPO), that their Sustainable Communities Strategy (SCS) would, if implemented, achieve the passenger vehicle greenhouse gas (GHG) emission reduction targets for 2020 and 2035, set by the Board in 2010.

The Butte County Association of Governments (BCAG) released the Public Review Draft of their Metropolitan Transportation Plan (MTP), on September 27, 2012. The MTP includes a chapter that serves as the region's SCS. It contains integrated land use and transportation strategies that will allow the Butte region to achieve targets for reducing greenhouse gas emissions by 2035. This region with approximately 220,000 people in the northern Sacramento Valley is largely agricultural with two established population centers and additional smaller jurisdictions.

For the Butte region, the Board set passenger vehicle greenhouse gas reduction targets at a one percent increase for 2020 and at one percent increase by 2035 based on the latest data available from BCAG at that time. The MTP/SCS adopted by the BCAG Board in December 2012 affirms that the region will achieve greenhouse gas reductions beyond the established targets by reducing greenhouse gas emissions by two percent in 2020 and two percent in 2035. On December 17, 2012, BCAG transmitted the adopted SCS to ARB for review.

Consistent with ARB's July 2011 technical methodology for SCS evaluation, ARB staff prepared this technical report to support the Board's action on BCAG's MTP/SCS. This report describes both the method ARB staff used to review BCAG's SCS greenhouse gas quantification and the results of ARB staff's technical evaluation. Specifically, staff reviewed how well the region's travel demand modeling and related analyses provide for the quantification of GHG emission reductions associated with the SCS. This included reviewing data inputs, planning assumptions on future year land use, housing, and transportation policies, and modeling results.

This review affirms that BCAG's adopted SCS demonstrates that, if implemented, the region will achieve a two percent per capita passenger vehicle greenhouse gas reduction in 2020, and a two percent reduction in 2035, exceeding the established targets.

I. BUTTE REGION

A. Background

Butte County encompasses approximately 1,665 square miles in northern central California. The western part of the county is located in the northern Sacramento Valley, while the eastern portion extends into the foothills of the Cascade and Sierra Nevada Mountain Ranges. The region's elevation ranges from 50 feet above sea level in the west to 7,000 feet above sea level near the county's northeastern border.

The Butte County Association of Governments is the federally designated Metropolitan Planning Organization (MPO) and the state designated Regional Transportation Planning Agency for Butte County. The BCAG Board of Directors includes each of the five Butte County Supervisors and one council person from each of the five incorporated cities/town: the cities of Biggs, Chico, Gridley, Oroville, and the Town of Paradise. The County is also home to four Native American Rancherias. These include Berry Creek Rancheria, Chico Rancheria, Enterprise Rancheria, and Mooretown Rancheria. Numerous unincorporated communities also dot the region. Development of the BCAG's 2012 Metropolitan Transportation Plan/Sustainable Communities Strategy was conducted through collaboration with member jurisdictions, the BCAG advisory committees, local Tribal Governments, interested State and federal agencies, and the public.

B. Blueprint Planning and MTP/SCS

Prior to 2008, when SB 375 introduced the requirement to develop a SCS, the Butte region had already begun efforts to integrate land use and transportation planning. Due to increasing growth pressures in the previous decade, BCAG initiated the Blueprint Planning Program in 2006 to establish a multi-faceted planning process that would help facilitate an informed land use and transportation decision-making process, and provide an improved environmental permitting process for future transportation and land use projects. One of the outcomes of the Blueprint Planning Program included the initiation of the Butte Regional Conservation Plan (BRCP). The BRCP is a joint Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) meant to bring stakeholders together to streamline development permitting and ensure habitat conservation for endangered and threatened species. The HCP/NCCP ties together federal and state conservation considerations into one planning process. Both the Blueprint Planning Program and the BRCP involved interested members of the public and local jurisdictions. These planning efforts helped to inform the land use and transportation options outlined in the BCAG Sustainable Community Strategy and led to the development of three scenarios from which BCAG crafted the region's preferred alternative.

C. BCAG Land Use Alternatives

One of the early steps BCAG took in developing their Sustainable Community Strategy was to design a number of land use and transportation alternatives. Once these alternatives were outlined, the MPO, in conjunction with its stakeholders, decided which of these alternatives best met its goals, including the regional passenger vehicle greenhouse gas reduction target of one percent increase in both 2020 and 2035.

BCAG developed three distinct land use alternatives for the purpose of illustrating the travel effects of different development patterns on the regional transportation system and the associated greenhouse gas emissions resulting from these patterns. Using the three scenarios, BCAG tested the performance of its regional travel demand model to ensure it adequately reflected modeled changes in land use. The land use scenarios were designed by first assembling a "balanced" scenario. BCAG prepared the "balanced" scenario, Scenario #1, based on land use information from recent general plan updates from its members, the latest information regarding planned development, assumptions regarding infill and redevelopment, regional growth forecasts, and a review of development attractions (i.e., motorized and non-motorized transportation networks, existing development, utility areas, etc.) and discouragements (i.e., resource areas and farmland, public lands, areas exceeding 25% slope, etc.). BCAG also prepared "dispersed" (Scenario #2) and "compact" (Scenario #3) scenarios. BCAG's description of all three scenarios is summarized in Table 1.

Table 1: BCAG Description of Land Use Alternatives

Scenario	Description
Balanced (1)	• Balanced share of new housing within the center, established and new growth areas • Contains reasonable levels of infill and redevelopment • Consistent with local land use plans and draft habitat conservation plan • Consistent with BCAG long-term regional growth forecasts by jurisdiction
Dispersed (2)	• Largest share of single-family housing with a greater amount of growth directed to the new, rural, and agricultural growth areas • Minimize the amount of infill and redevelopment • Exceeds the unincorporated areas local land use plans reasonable capacities for growth
Compact (3)	• Greatest share of infill and redevelopment within the established and center growth areas • Highest share of multi-family housing • Potential incompatibilities with existing infrastructure capacity • Exceeds the incorporated areas local land use plans reasonable capacities for growth • Inconsistent with known housing type demand

Source: BCAG 2012 MTP/SCS Land Use Scenario Analysis

Each of the scenarios was prepared using consistent regional employment, population and housing growth projections and the same regional transportation network. However, the following land use variables were adjusted to create the distinctive scenarios:

- The amount of development occurring within each of the five growth areas (i.e., urban center and corridor, established, new, rural, and agricultural).
- The levels of infill and redevelopment occurring within the urban center and corridor and established growth areas.
- The shares of single-family to multi-family development.
- The amount of growth being accommodated within each local jurisdiction.

These factors are consistent with guidance on developing SCS planning assumptions provided in the CTC's 2010 RTP Guidelines (see Appendix A for applicable guideline elements).

BCAG selected the balanced scenario as the basis upon which to achieve its 2020 and 2035 greenhouse gas reductions. To further describe the framework for the region in the MTP/SCS, BCAG developed a set of five growth area types, adapted from a framework crafted by the neighboring Sacramento Area Council of Governments (SACOG). Local land use plans including adopted and proposed general plans, specific plans, master plans, corridor plans, and others were divided into one of five growth area types based on the location of the plans (Table 2).

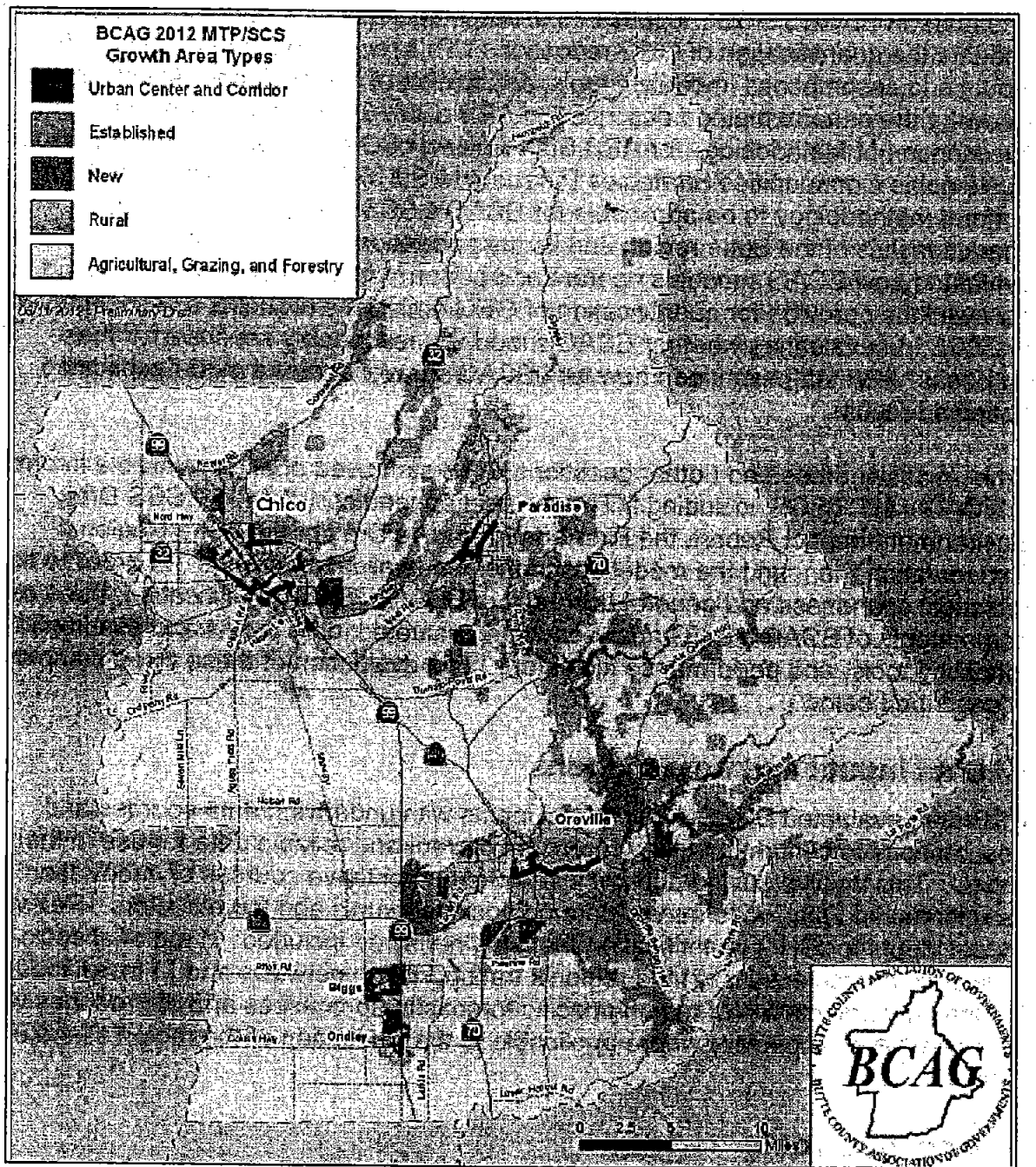
Table 2: BCAG Growth Area Type Description

Growth Area Type	Description
Urban Center and Corridor Areas	• Compact infill development, robust transit service, mixed land uses • Highest densities
Established Areas	• Existing urban development surrounding urban center and corridors. • Range of densities
New Areas	• Growth at the periphery of established areas. • May be residential, employment, or mixed uses at urban densities.
Rural Areas	• Limited transit, pedestrian, and bicycle infrastructure. Primarily residential. • Primarily residential area with low densities.
Agricultural, Grazing, & Forestry Areas	• Commercial and residential uses are secondary to agricultural, grazing, and forestry uses. • Lowest densities

Source: BCAG 2012 MTP/SCS Land Use Scenario Analysis

Figure 1 provides an illustration of the growth area types and the distribution of each growth type across the region.

Figure 1: BCAG Growth Area Types



Source: 2012 BCAG MTP/SCS Land Use Allocation Model Technical Methdology

II. APPLICATION OF ARB STAFF REVIEW METHODOLOGY

The review of BCAG's SCS focuses on the technical aspects of regional modeling that underlie the quantification of GHG reductions. This review examines BCAG model inputs and assumptions, modeling tools, application of the model, and modeling results, following the general method described in ARB's July 2011 document entitled "Description of Methodology for ARB Staff Review of Greenhouse Gas Reductions from Sustainable Communities Strategies Pursuant to SB 375." ARB staff tailored the general methodology to be applicable for BCAG's SCS to address the unique characteristics of the Butte region and its transportation modeling approach. ARB staff evaluated how BCAG's models operate and perform in estimating travel demand, and how well they provide for quantification of GHG emissions reductions associated with the SCS. In evaluating whether BCAG's model is reasonably sensitive for these purposes, ARB staff examined how well BCAG's travel demand model replicated observed results.

To help answer these and other questions, ARB staff used publicly available information in BCAG's MTP/SCS, including MTP technical appendices, the MTP/SCS Draft Environment Impact Report, the First Administrative Draft of the Butte Regional Conservation Plan, and the model description and validation reports. In order to assess technical soundness and general accuracy of BCAG's GHG quantification, three central components of BCAG's GHG analyses were evaluated: data inputs and assumptions, modeling tools, and performance indicators. The evaluation of these three components is described below.

A. Data Inputs and Assumptions

ARB staff evaluated BCAG's key model inputs with underlying data sources and assumptions to confirm that they represent current and reliable data for use in their model. This involved using publicly available, authoritative sources of information, such as national and statewide survey data on socioeconomic and travel factors. Relevant model inputs for GHG quantification that staff reviewed included: 1) regional socio-economic characteristics, 2) the region's transportation network, and 3) travel inputs. Related documentation of region-specific forecasting processes and approaches were also evaluated, especially where applicable to the evaluation of the region's land use forecast.

B. Modeling Tools

BCAG's modeling documentation reports were reviewed to assess how well their travel demand model replicates observed results based on both the latest socioeconomic, and travel data inputs and assumptions used to model the SCS. ARB staff reviewed outputs from BCAG's run of ARB's Emissions Factors 2007 (EMFAC) model to assess reasonableness of the expected reduction in carbon dioxide emissions from BCAG's SCS. In addition, BCAG's modeling practices were reviewed for consistency with California Transportation Commission's (CTC) "2010 California Regional Transportation

Plan Guidelines," the Federal Highway Administration's (FHWA) "Model Validation and Reasonableness Checking Manual," and other key modeling guidance and reference documents (see Appendix A for more detailed information).

C. Performance Indicator

Staff evaluations of SCSs use performance indicators to test the travel demand and land use allocation models for sensitivity to changes in vehicle miles traveled (VMT), whether through changes in travel modes, vehicle trip distances, or land use. For the Butte region, ARB staff selected residential density as the performance indicator to evaluate the passenger vehicle greenhouse gas reduction resulting from the implementation of the MTP/SCS. Residential density was selected as the performance indicator because the MTP/SCS suggests that changes in density will provide a substantial proportion of the greenhouse gas reductions. ARB staff performed a qualitative evaluation to determine if increases or decreases in this indicator were directionally consistent with BCAG's modeled greenhouse gas emissions reductions.

III. DATA INPUTS AND ASSUMPTIONS

BCAG's MTP/SCS modeling approach is based upon a number of inputs and assumptions, which influence the effectiveness of the GHG emission reduction strategies. Inputs and assumptions are fed into the model to characterize existing and future land use, socioeconomic and transportation network characteristics. ARB staff evaluated the appropriateness of the data that were used and the model's response to changes in these inputs and assumptions.

A. Demographics and the Regional Growth Forecast

Demographic data describe a number of key characteristics used in travel demand models. The MTP/SCS uses demographic data to describe where the Butte population lives, works, and travels during the planning period. Using demographic information and a set of assumptions, BCAG developed its 2010-2035 Regional Growth Forecast for three demographic inputs: population, employment and housing. Specifically, BCAG developed low, medium and high growth scenarios for the region's population, employment, and housing figures. BCAG regularly updates its Regional Growth Forecast and the agency plans to next update the Regional Growth Forecast in the 2014-2015 fiscal year. BCAG used its medium growth projections from the Regional Growth Forecast because that growth scenario was based on historic data and input from local planning staff, which BCAG staff found to result in the most realistic growth scenario. Table 3 reports BCAG's population, employment and housing figures for 2005 and 2010 and summarizes BCAG's medium growth forecasts for 2020 and 2035.

Table 3: BCAG Regional Growth Forecast

Year	Population	Employment	Housing Units
2005	214,582	73,400	91,666
2010	221,768	71,501	96,623
2020	257,266	87,214	111,813
2035	332,459	112,279	143,948

Source: 2010-2035 BCAG Regional Growth Forecast & BCAG Modeling Parameters

Butte's Regional Growth Forecast is based on data from the California Department of Finance and the California Employment Development Department.

Over the past several years, BCAG has coordinated a number of planning efforts through its Blueprint Planning Program that informed the Regional Growth Forecast. Established in 2006, BCAG initiated this multi-faceted planning process resulting in: 1) the 2008 Regional Growth Forecasts; 2) the establishment of Regional Guiding Principles, an Ecological Baseline Assessment Report, Landcover Mapping, Biological Constraints Analysis, and Butte County Meadowfoam Evaluation: 3) the initiation of the Butte Regional Conservation Plan; and 4) the integration of the region's local general plan updates, the Butte Regional Conservation Plan and Metropolitan Transportation Plan. As of 2012, four of the region's six local jurisdictions had completed general plan updates, and the remaining two jurisdictions had initiated an update process. The jurisdictions' new general plans provided the foundation for the region's SCS. While each city underwent its general plan update process, BCAG made available scientific information developed for the Butte Regional Conservation Plan in order to inform options that consider habitat conservation and as local jurisdictions decided on the size of their land use footprint.

Housing

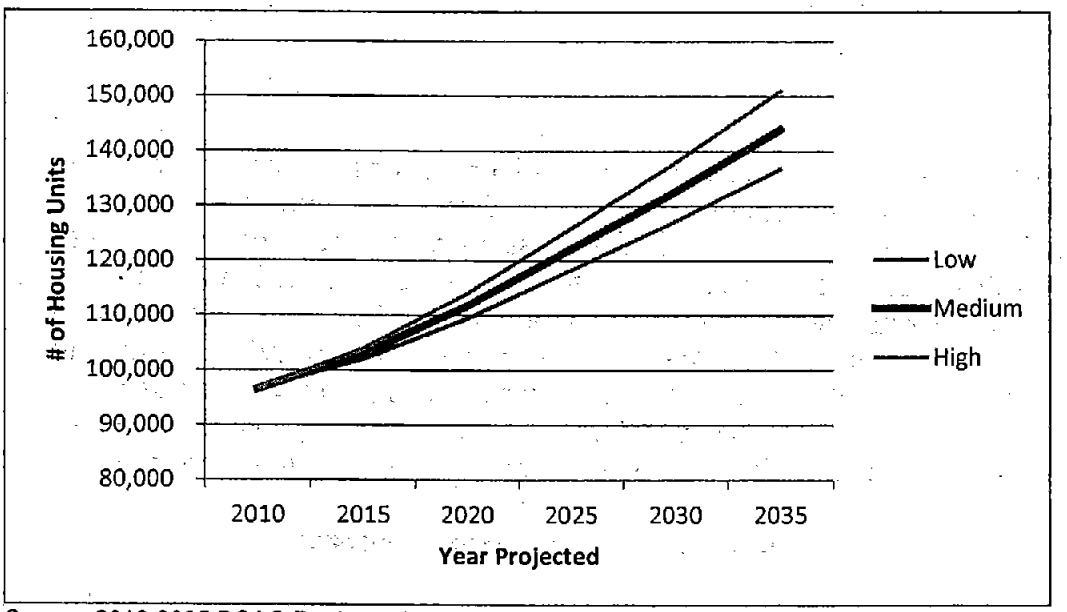
BCAG's Regional Growth Forecast developed three housing scenarios: low, medium, and high growth. BCAG elected to use the medium housing scenario in order to reflect the most probable scenario. To develop the forecasts, BCAG analyzed the December 2010 California Department of Finance (DOF) long range population and housing projections for the period between years 2010 and 2035. These projections suggest that the Butte County region will grow at a compound annual growth rate (CAGR) of 1.8%. This information was used to establish the control total for BCAG's high forecast scenario.

Next, BCAG gathered additional data and local input to develop a medium growth forecast scenario. BCAG compiled historic building permit data and revised its 2006 BCAG growth forecasts utilizing 2010 base line data from DOF for each jurisdiction in the region. After reviewing the information described above, planning staff from the local jurisdictions provided input on future housing development levels considering their most recent local land use plans and knowledge of current development activity. Based on the information gathered, BCAG developed an estimate of the production of new

housing units occurring within each jurisdiction, for each five year increment out to the year 2035. That information resulted in a 1.6% regional CAGR for the middle growth forecast. BCAG applied that lower growth rate to the 2010 base year housing figure to represent the medium forecast scenario.

Based on the 0.2% compound annual growth rate difference between the high and medium scenarios, BCAG applied a CAGR of 1.4% to the baseline to develop the low growth scenario. Each jurisdiction's growth, represented in five year increments, was adjusted from the medium scenario to the high and low scenarios based on its share of growth. See Figure 2 for the low, medium, and high housing projections.

Figure 2: Housing Projections (2010-2035)



Source: 2010-2035 BCAG Regional Growth Forecast

The housing projection in the SCS must link to the Regional Housing Needs Assessment (RHNA). California jurisdictions must adopt housing element updates that demonstrate accommodation of an eight-year projection of housing need outlined through a region's RHNA allocation. The methodology takes each jurisdiction's percentage share of growth forecasted in the Butte County Long-Term Regional Growth Forecasts 2010-2035 for the period from 2015 to 2025, and multiplies that percentage by the overall RHNA allocation mandated by Housing and Community Development. The resulting number is the total unit allocation for each jurisdiction. In Butte's case that allocation amounts to 10,320 housing units. The Butte Regional Housing Needs Plan (RHNP) figures, as well as the proposed SCS housing allocations, are shown in Table 4. Consistent with SB 375 requirements, BCAG's SCS provides sufficient housing to meet the total housing allocation.

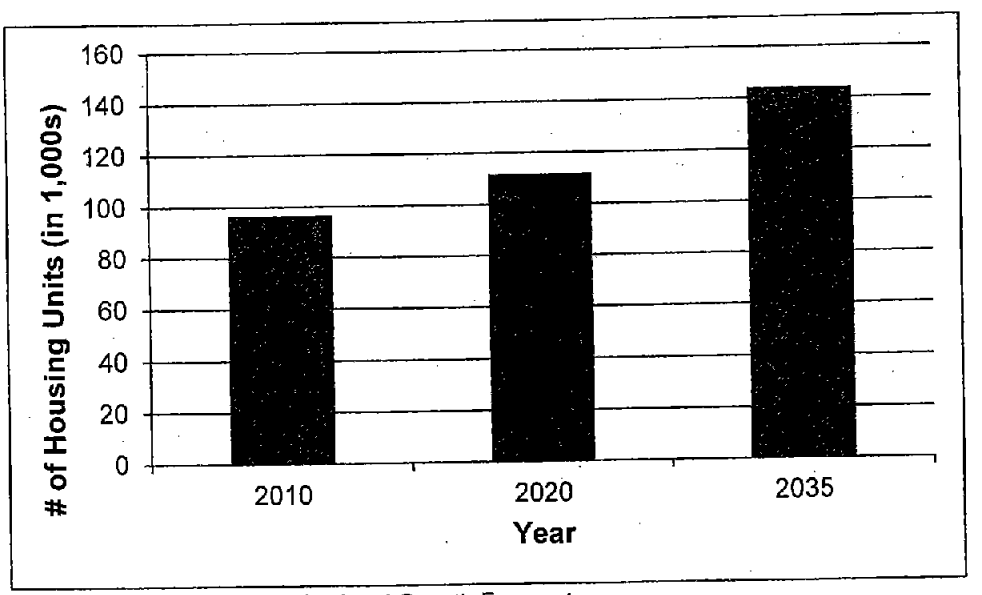
Table 4: Housing Allocation by Jurisdiction

Jurisdiction	Total Housing Unit Medium Growth Forecast (2010 – 2035)	RHNP Growth Allocation (2014-2022)
Biggs	950	184
Chico	19,255	3,963
Gridley	3,405	769
Oroville	6,565	1,793
Paradise	2,975	637
Butte County Unincorporated	14,175	2,974
Total Region Growth	47,325	10,320

Source: BCAG 2012 MTP/SCS

In 2010, the Butte region had approximately 96,600 housing units. At that time, the largest number of housing units existed in the Established Area growth type. The MTP/SCS shows the majority of planned housing growth occurring in the Established Area, minimizing development on currently undeveloped, agriculturally significant, and/or environmentally sensitive areas. There will still be growth in the New Area growth type, specifically 32% of the region's new housing by 2035. Despite the economic down turn, BCAG expects that the housing supply will increase by over 47,000 units from the 2010 to 2035 (Figure 3). Most of that growth occurs after 2020, reflecting BCAG's assumption that historic growth rates will return after the year 2020.

Figure 3: Housing Growth Forecast



Source: 2010-2035 BCAG Regional Growth Forecast

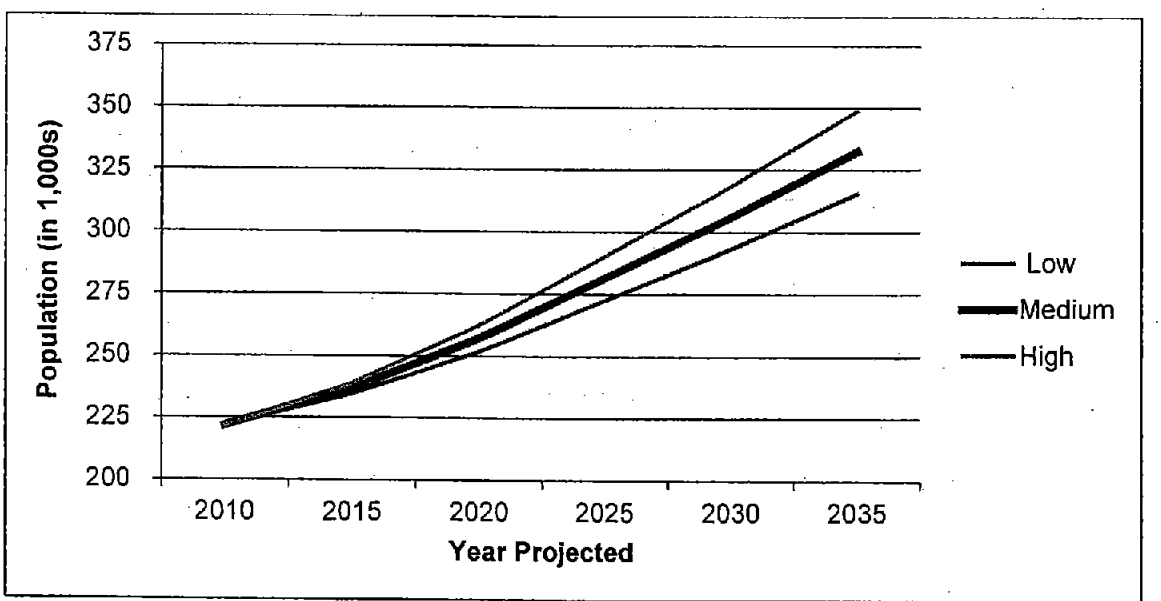
Assuming that the housing growth occurs evenly throughout the planning cycle, the Butte region would need to add nearly 1,900 housing units per year between 2010 and 2035, for a total of approximately 47,000 units to meet the projections outlined in the MTP/SCS. Between 2010 and 2020, BCAG projects the region will add approximately 15,190 housing units and in the following fifteen years increase the stock by about 32,135 units.

Population

As was done for the housing projection, BCAG established a low, medium and high population growth forecast. For the purposes of the SCS, BCAG chose the medium growth population forecast (Figure 4). The forecast indicates that the Butte region population is expected to grow by approximately 36,000 people between 2010 and 2020, and by about 111,000 people between 2010 and 2035. That growth between 2010 and 2035 amounts to about a thirty-five percent increase, even after including the effects of the recent economic slowdown, most evident in the near term of 2010 to 2020 (Table 5). In total, BCAG projected its population to reach about 332,000 by 2035.

In May 2012, the DOF released a population projection for years 2015 to 2050 in five year increments by county, which reflect the impacts of the recession and the 2010 U.S. Census data. For Butte County, the DOF forecasted 244,417 people in 2020 and 290,186 for 2035. In contrast, the BCAG population forecast was developed prior to both the 2012 DOF release and the 2010 U.S. Census release. As a result, the BCAG projection is higher by 12,849 people in 2020 and by 42,273 people in 2035. In other words, the Butte's forecast is about five percent higher than the most recent DOF forecast in 2020 and about thirteen percent higher in 2035. This difference is explained in that Butte's forecast was built from 2010 DOF data that may not have fully captured the effects of the recession as well as the most recent 2012 data.

Figure 4: Population Growth Forecast



Source: 2010-2035 BCAG Regional Growth Forecast

Table 5: Population Growth Forecast

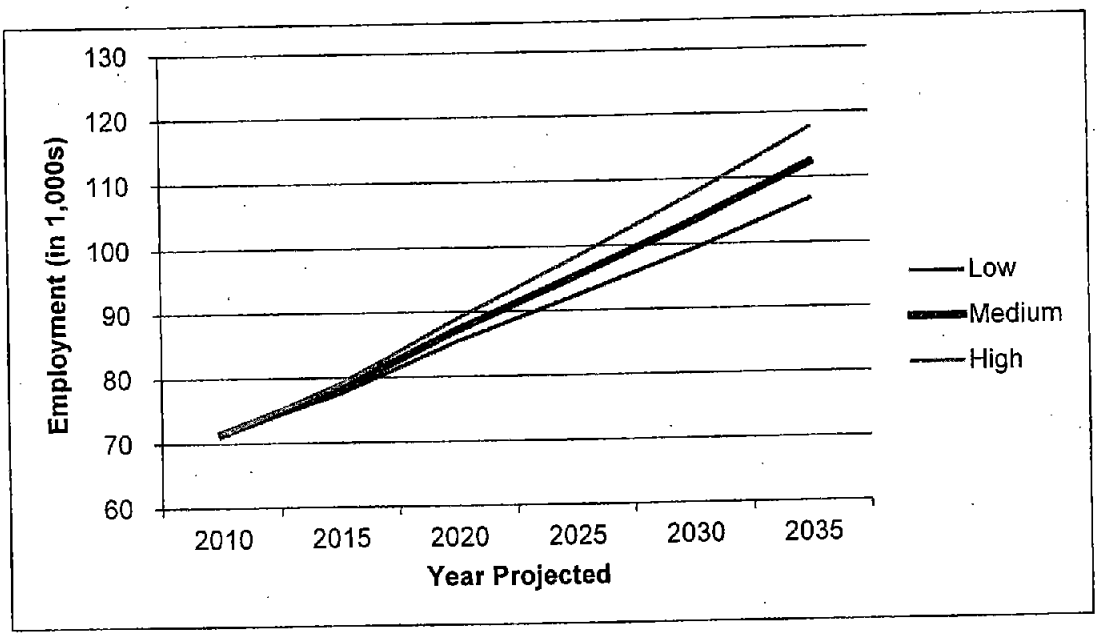
Year	Population Growth Forecast	Population Growth Between Planning Years
2010	221,768	--
2020	257,266	35,498
2035	332,459	75,193

Source: 2010-2035 BCAG Regional Growth Forecast

Employment

BCAG in its regional growth forecast prepared employment figures for low, medium and high growth scenarios, and elected to use the medium growth forecast as the basis for its MTP/SCS (Figure 5). BCAG prepared its employment forecast for the region as a whole. The employment forecasts are based on a ratio of jobs per housing unit. BCAG reported that employment should rebound from its current estimate of 0.74 jobs per housing unit in 2010 to moderate historic levels by the year 2020 and then maintain a 0.78 ratio into the horizon year of 2035.

Figure 5: Regional Employment Growth Forecast



Source: 2010-2035 BCAG Regional Growth Forecast

Baseline 2010 employment data was obtained from the California Employment Development Department (EDD) for the year 2009 – an annual average for 2010 was not available at the time the BCAG regional forecasts were prepared. The 2009 EDD data provide a total of all non-farm jobs for the region. This information was then used in conjunction with 2009 DOF preliminary housing unit estimates to calculate a ratio of 0.74 jobs per housing unit.

Historic employment information was also obtained from the EDD for the period between 1990 and 2009 and averaged to calculate a long range jobs to housing unit ratio of 0.78. This ratio was applied to the years 2020-2035 and based on the assumption that historic rates of employment will return by the year 2020. Anticipating a recovery from the existing lows of the economy, an average of the 2010 ratio and long-term ratios were prepared for the year 2015, resulting in a ratio of 0.76 jobs per housing unit. Lastly, the jobs to housing unit ratio developed for each 5 year period was applied to all scenarios. The long-term forecasts estimate that the region will return to historic levels of 0.78 jobs per housing unit by the year 2020, suggesting an improved jobs-housing balance for the region.

Butte's growth forecast indicates a need to accommodate approximately 15,700 new employees between 2010 and 2020, and approximately 25,065 new employees between 2020 and 2035 (Table 6). That would result in a regional increase of new employees between 2010 and 2035 to 41,000 employees. Most of the new employees would be in Established Areas and the second most growth would occur in Urban Center and Corridor Areas.

Table 6: Employment Growth Forecast by Growth Type

Growth Area Type	2010 Existing Employees	2010 - 2020 New Employees	2010 - 2035 New Employees	Total 2035 Forecasted Employees
Urban Center and Corridor Areas	30,471	3,063	9,804	40,275
Established Areas	37,535	11,137	23,573	61,108
New Areas	1,277	893	6,229	7,506
Rural Areas	950	429	902	1,852
Agricultural, Grazing, and Forestry Areas	1,268	192	271	1,539
Region Total	71,501	15,713	40,778	112,279

Source: BCAG 2012 MTP/SCS

The growth forecasts used in the SCS modeling analysis for housing, population, and employment used reasonable methodologies for MPO forecasting. BCAG relied on appropriate federal and state sources, such as the U.S. Census (2000 and 2010) and the California Department of Finance, and also convened a panel of local planning staff as part of its growth forecast process. Butte's forecasting methods are consistent with

those used by the U.S. Census Bureau and the California Department of Finance (DOF). Since the completion of BCAG's Regional Growth Forecast in early 2011, the Department of Finance has revised its population and housing projections, thus the BCAG Regional Growth Forecast slightly overestimates population, housing and employment figures when compared to the data available in 2012.

B. Current and Future Land Use Development Patterns

As part of the MTP/SCS development process, BCAG created the region's first land use allocation model for the purpose of assisting in preparing the forecasted development pattern for the MTP/SCS. The model was used to develop three distinct land use allocation scenarios for analysis in the MTP/SCS. One of these land use scenarios was selected as the basis from which BCAG will plan to address transportation infrastructure needs. Forecasting of future development patterns is an important step to developing an accurate picture of future travel demand in the region.

All three scenarios were prepared using the same regional employment, population and housing growth projections and regional transportation network. However, the following land use variables were adjusted to create the distinct scenarios:

- The amount of development occurring within each of the five Growth Areas (i.e., Urban Center and Corridor, Established, New, Rural, and Agricultural).
- The levels of infill and redevelopment occurring within the Urban Center and Corridor and Established Growth Areas.
- The shares of single-family to multi-family development.
- The amount of growth accommodated within each local jurisdiction.

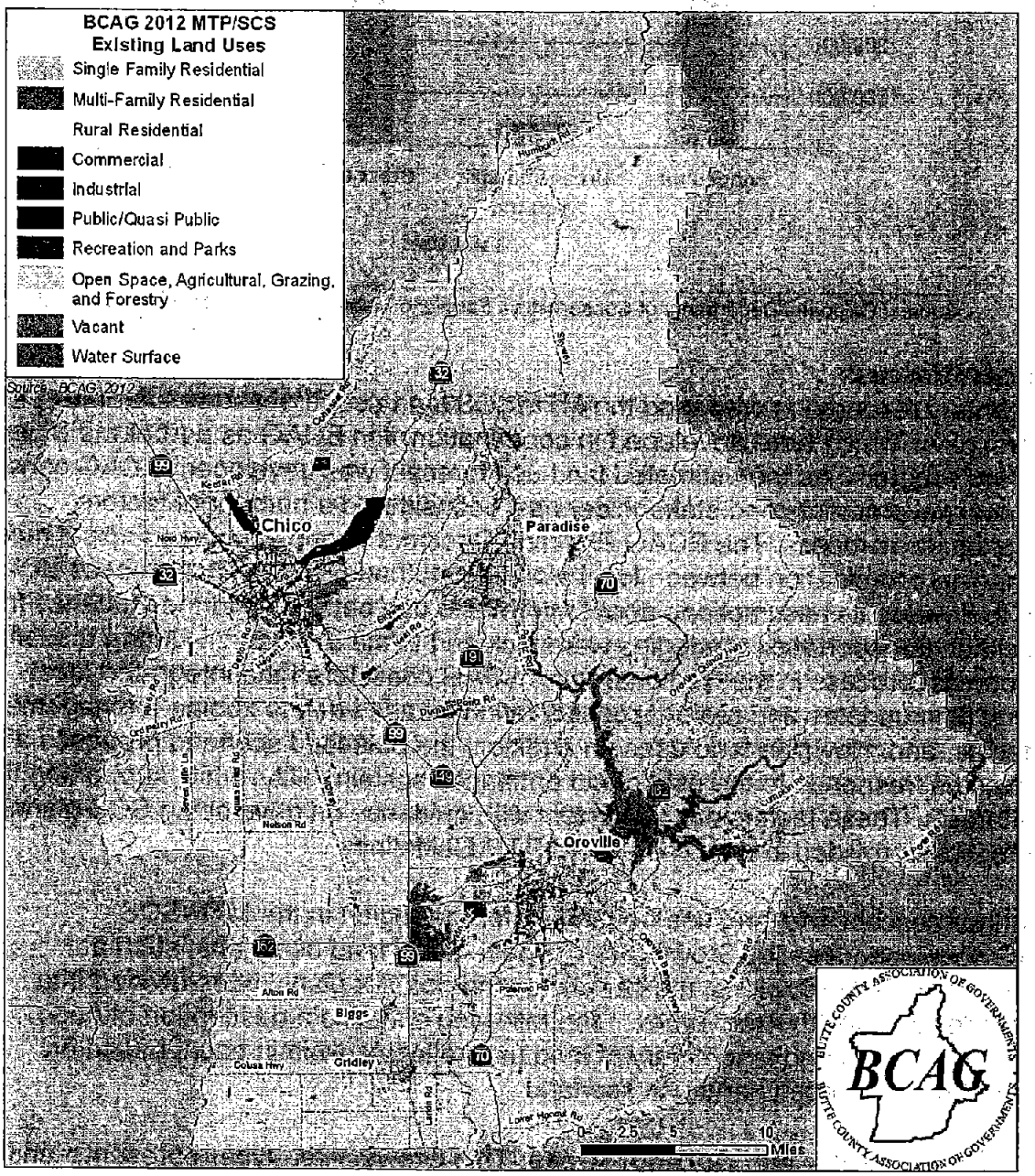
The land use scenarios were designed by first assembling the "balanced" scenario. The "balanced" scenario (scenario #1) was prepared based on land use information from the recent general plan updates, the latest information regarding planned development, reasonable assumptions regarding infill and redevelopment, regional growth forecasts, and a review of development attractions (i.e., motorized and non-motorized transportation networks, existing development, utility areas, etc.) and discouragements (i.e., resource areas and farmland, public lands, areas exceeding 25% slope, etc.). Secondly, the "dispersed" (scenario #2) and "compact" (scenario #3) scenarios were prepared to represent development occurring at opposing ends of the spectrum from scenario #1.

Current Land Use

Land use patterns in the county are primarily determined by geographic conditions and political jurisdiction. In Butte County, most of the land is purposed as agricultural (Figure 6). Only about 45,000 acres are classified as urban and built-up land, while about 650,000 acres are categorized as agricultural land and 356,000 are classified as "other"

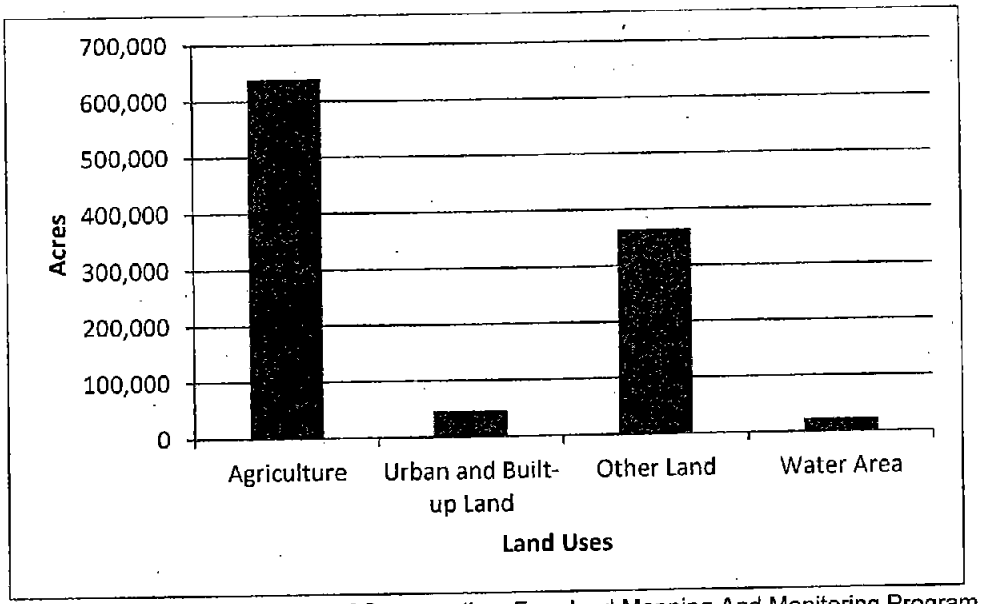
lands under the California Department of Conservation Farmland Mapping and Monitoring program (Figure 7). The Department of Conservation defines other lands as land not included in any other mapping category. Common examples include low density rural developments, brush, timber, wetland, and riparian areas not suitable for livestock grazing, confined livestock facilities, strip mines, and water bodies smaller than forty acres.

Figure 6: Current Land Uses



Source: BCAG 2012 MTP/SCS Public Workshop Presentation

Figure 7: Current Land Use by Category (2010)



Source: California Department of Conservation, Farmland Mapping And Monitoring Program, 2012

Forecast Process

The primary resource in preparing the MTP/SCS land use forecast was the latest local general plans which were developed in coordination with BCAG as part of the Blueprint Planning Program. As the estimated land use forecast was developed, BCAG consulted with local governments and stakeholders as it considered a number of factors throughout the process. The BCAG Planning Directors Group was the principal means for ongoing coordination between local planning staff and BCAG. The process BCAG used to develop its assumptions about future land use patterns and the influence from associated transportation strategies were included in the evaluation. During the land use forecast process in the Regional Plan, BCAG considered the integrated local general plan updates and regional conservation plans to define zoning, management strategies, and allowable land uses. In addition, the balanced scenario proposes a land use mix that responds to the public and enhances sustainability, while supporting the SCS targets. These factors are consistent with guidance on developing SCS planning assumptions provided in the CTC's 2010 RTP Guidelines.

To further describe the land use framework for the region in the MTP/SCS, BCAG developed a set of Growth Area Types. Local land use plans, such as general plans, specific plans, master plans, and corridor plans, were divided into one of the five Growth Area Types. The following contains a description of each Growth Area Type and a summary of land uses allocated within each, based on the preferred "balanced" land use scenario.

- **Urban Center and Corridor Areas:** This Growth Area type represents land uses most associated with urban areas. This area features higher densities, mixed land uses, robust transit service and planned or existing non-motorized

transportation infrastructure. These areas typically have existing or planned infrastructure for non-motorized transportation modes which are more supportive of walking and bicycling. Growth in this area would include compact infill developments on underutilized lands, or redevelopment of existing developed lands. Local plans often label these areas as downtowns, central business districts, or mixed use corridors.

- **Established Areas:** This category generally includes existing urban developments surrounding the Urban Center and Corridor Areas. Locations disconnected from Urban and Corridor Centers may be residential-only, employment-only, or a mix of uses with urban densities. These areas consist of a range of urban development densities with most locations having access to transit through the urban fixed route system or commuter service. Future growth within these areas typically utilizes locations of currently planned developments or vacant infill parcels. Local plans generally seek to maintain the existing character of these areas.

- **New Areas:** The New Areas are typically connected to the outer edge of an Established Area. These areas currently consist of vacant land adjacent to existing development and represent areas of future urban expansion. Future growth within these areas will most often consist of urban densities of residential and employment uses with a few select areas being residential only. Local plans identify these areas as special planning or specific plan areas, master plans, and planned development or planned growth areas. Currently, fixed route transit does service such areas. However, fixed route transit service would likely be provided to areas which are directly adjacent to current urban routing as part of build-out. Planning requirements by local jurisdictions would generally call for the construction of quality pedestrian and bicycle infrastructure to accompany New Area developments.

- **Rural Areas:** This Growth Area type is made up of areas outside existing and planned urban areas with development at low residential densities. These areas are predominantly residential and may contain a small commercial component. The densities at which these areas are developed do not reasonably allow for pedestrian or bicycle infrastructure and transit service is limited or nonexistent. Automobile travel is typically the transportation option.

- **Agricultural, Grazing, and Forestry Areas:** This area represents the remaining areas of the region not being planned for development at urban densities. These areas support agricultural, grazing, forestry, mining, recreational, and resource conservation type uses. Locations within these areas may be protected from future urban development under federal, state, and local plans or programs such as the Chico area "greenline", Williamson Act contracts, or conservation easements. Employment and residential uses are typically allowed within portions of this area but are most often secondary to agricultural, forestry, or other rural uses.

The MTP/SCS estimates that there will be an increased demand for multi-family housing. BCAG defines multi-family housing as attached dwelling units with densities of 13 to 50 units per acre, while single-family housing is defined as detached residential dwellings ranging from 13 units per acre to 1 unit per 160 acres. Regionally, 28% of the new housing in the forecasted development pattern is multi-family and 72% is single family. This demonstrates a moderate shift in the housing mix from the estimated existing mix of 25% multi-family and 75% single family (see Table 7).

Table 7: Percent of Housing Units by Growth Type

Growth Area Type	2010 Existing Housing Units		2010-2020 New Housing Units		2020-2035 New Housing Units	
	Single Family	Multi-Family	Single Family	Multi-Family	Single Family	Multi-Family
Urban Center and Corridor Areas	42%	58%	44%	56%	26%	74%
Established Areas	74%	26%	72%	28%	74%	26%
New Areas	99%	1%	74%	26%	68%	32%
Rural Areas	100%	0%	100%	0%	100%	0%
Agricultural, Grazing, and Forestry Areas	97%	3%	100%	0%	100%	0%
Region Total	75%	25%	74%	26%	72%	28%

Source: BCAG 2012 MTP/SCS

The greatest shift in housing mix is within the Urban Center and Corridor Growth Areas and the New Growth Areas. The share of multi-family housing in the Urban Center and Corridor Areas grows 16% from 58% in 2010 to 74% in 2035. A similar trend appears in the New Area Growth type where it is estimated that 32% of the new housing in the New Growth Areas will be multi-family housing by 2035. The distributions for all growth areas are summarized in Table 7. Although this table suggests that there are significant shifts in residential land use and housing types, the share of multi-family and single-family residences remains fairly similar between the base year and 2035. Because of the broad range of density used to define single family and multi-family as previously described, there could be shifts in land use that would support lower vehicle miles traveled, for example, if more single family units were developed on smaller lot sizes.

C. Transportation Network Inputs and Assumptions

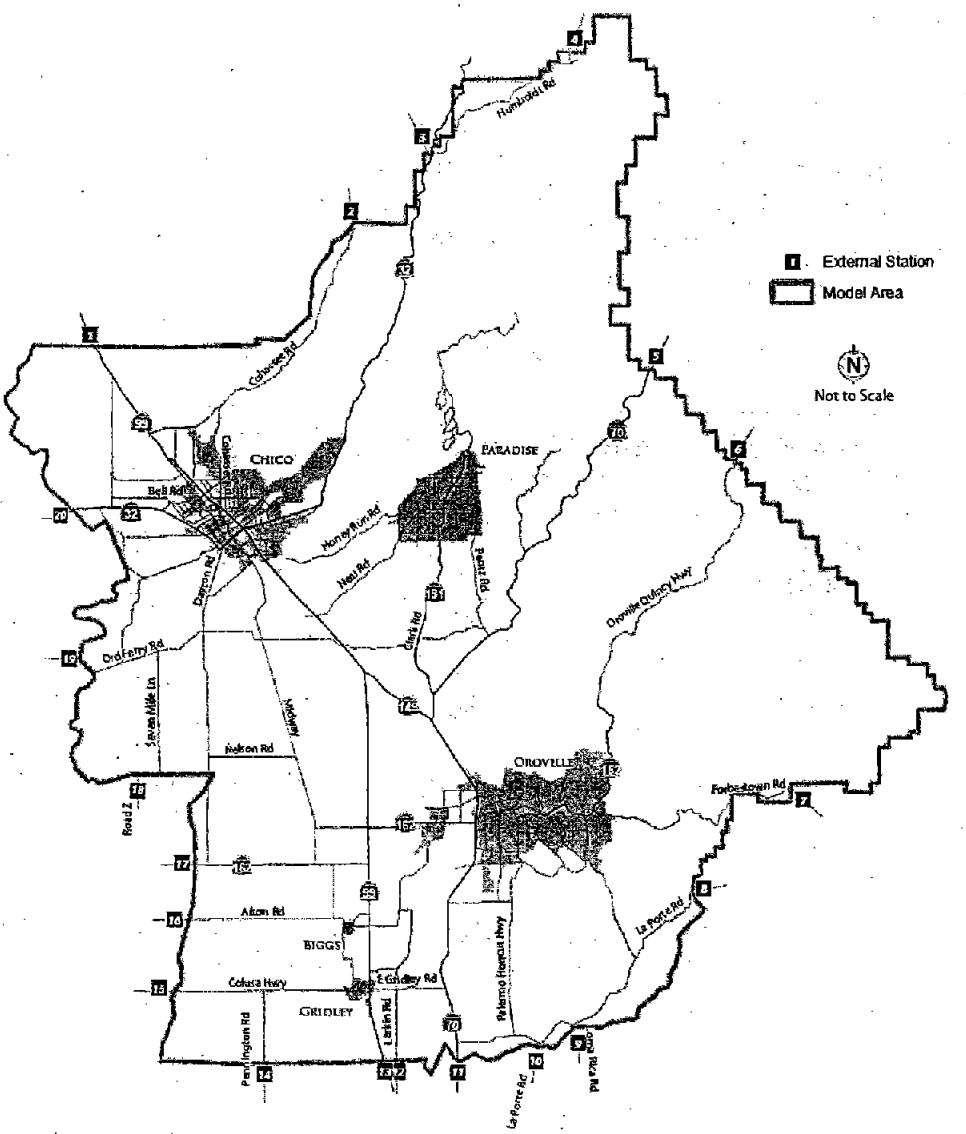
Inputs and assumptions associated with the BCAG trip-based travel demand model, such as street network, link capacity, free-flow speed, were reviewed per standard evaluation procedure. BCAG states that the sources of model inputs include Caltrans traffic data, Department of Finance housing estimates, Employment Development Department employment estimates, California Statewide Household Travel Survey

(2001), U.S. Census (2000), Butte Regional Transit ridership data, BCAG parcel and footprint land use data, and the 2010 Info USA employment data.

Street Network

The BCAG street network is a representation of the automobile roadway system, which includes freeways, state highways, arterials, collectors, and local roads within the model area (Figure 8). The street network database includes attributes such as street name, distance, functional class, speed, link capacity, and number of lanes. BCAG's consultant verified these attributes using maps, aerial photographs, and data provided by BCAG staff. Figure 8 summarizes BCAG's 2010 roadway inventory in lane miles by functional class.

Figure 8: Street Network of BCAG



Source: BCAG (2011) Draft: Model Development Report

Table 8: BCAG Base Year Network Lane Miles by Functional Class

Functional Class	Lane Miles (2010)
Freeway	189
Arterials/Expressway	731
Collector and Local Street	6,276

ARB staff compared the methodology BCAG used in the street network development with suggestions from the National Cooperative Highway Research Program (NCHRP) Report 365. BCAG followed acceptable practice, and their methodology is consistent with the NCHRP 365 report[1]. In addition, the functional classification definitions used in the street network are consistent with FHWA's Federal Functional Highway Classification system.

Street Capacity

Street capacity is defined as the number of vehicles that can pass a certain point of the roadway at free-flow speed in an hour. BCAG's travel demand model uses street capacity as an input for estimating congestion. BCAG categorizes street capacities by functional class, which are expressed as hourly capacity in terms of vehicles-per-lane-per-hour (vplph), as summarized in Table 9.

Table 9: Reported BCAG Street Capacity

Functional Class	Street Capacity (vplph)	FHWA's Estimate on Maximum Street Capacity (vplph)
Freeway	1,800	2,350
Expressway	1,500	2,100
Arterial	800	1,408
Collector	700	1,408
Local Street	600	1,408

BCAG's street capacity assumptions are reasonable. The reported capacity values are less than the maximum allowable street capacities suggested by FHWA.

Free-Flow Speed

Travel demand models use free-flow speed to estimate the shortest travel time between the origin and the destination of a trip that is assigned to the street network. Factors such as the prevailing traffic volume on a link, posted speed limits, adjacent land use

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[1] The NCHRP Report 365 describes travel demand modeling theory and techniques, and their common applications by transportation planning agencies, and observed data for key modeling parameters at the national level.

activity, functional classification of a street, type of intersection control, and spacing of intersection controls can affect the actual travel speed. BCAG uses posted speed limits as free-flow speeds in travel demand modeling development. The reported speed limits in BCAG are listed by functional class in Table 10.

Table 10: BCAG Free-Flow Speed by Functional Class

Functional Class	Range of Speed (mph)
Freeways	55 to 65
Expressways	55 to 65
Arterials	30 to 40
Collectors	25 to 35
Local Streets	20 to 25

The methodology BCAG used in the estimation of free-flow speed based on the posted speed limits is consistent with the recommended practice indicated in the NCHRP Report 365.

Transit and Non-Motorized Transportation Facility

Table 11 summarizes the 2010 existing transit and non-motorized transportation facilities within BCAG. The region's transit needs are served by Butte Regional Transit, which operates "B-Line" fixed route bus service throughout the region. The definitions of bike path and bike lane used in the non-motorized facility are consistent with those given in the Caltrans Highway Design Manual.

Table 11: BCAG Transit and Non-Motorized Facility Lane Miles

Transportation Facility	Lane Miles (2010)
Fixed Route Transit Operation	333
Bike Lane (Class I[2] & II[3])	78

D. Travel Demand Inputs and Assumptions

Assumptions related to the number of vehicle trips and trip lengths influence a travel demand model's estimation and forecast on the amount of travel occurring in a region. ARB staff reviewed the key inputs and assumptions associated with the BCAG trip-

[2] Class I bicycle facilities are bike paths that provide a completely separated right of way for the exclusive use of bicycles and pedestrians, with cross-flow by motorists minimized.
[3] Class II bicycle facilities are bike lanes for one-way bike travel on a street or highway, which is demarcated with road striping.

based travel demand model. Upon availability and application of findings from empirical literature, trip data reported by BCAG are compared to independent sources.

Trip Generation Rates

Vehicle trip generation rates are used in a travel demand model to gauge what influences the amount of travel in a region and how the travel is generated. These factors usually include automobile ownership, household income, household size, types of land use, levels of employment, availability of public transportation, and quality of the transportation system. Trip generation inputs to the travel demand model are used to reflect the average weekday vehicle trips per household for each trip purpose in the BCAG region.

BCAG's consultant estimated trip generation rates for single- and multi-family homes based on data from the 2000 US Census. The selected variables for the trip generation step of the BCAG travel demand model are household size, number of workers, and household income. Trips are classified into one of five trip purposes: home-based work (HBW), home-based other (HBO), home-based casino (HB-Casino), home-based school (HB-School), or non-home-based (NHB). The reported base year vehicle trip rates per household are summarized in Table 12. The NCHRP Report 365 presents trip rate estimates associated with an urbanized area with a population of 200,000 to 499,999, which embraces the population size of a region similar to BCAG. Compared to the national average vehicle trips per household presented in the NCHRP Report 365, the trip rates of BCAG are reasonable.

Table 12: Average Vehicle Trip Rates per Household by Trip Purpose

Trip Purpose	BCAG (2010)	NCHRP Report 365 (1998)
HBW	1.67	1.64
HBO[4]	4.69	4.37
NHB	1.84	1.79

Trip Length Distribution

In the traffic assignment step of the travel demand model, trip lengths are estimated using the street network and used to calculate interzonal travel impedances. Table 13 summarizes the average reported auto trip length for all trip purposes of BCAG region.

[4] Home-based other (HBO) trips here include the original HBO, home-based casino, and home-based school trips reported by BCAG.

Table 13: Average Auto Trip Length

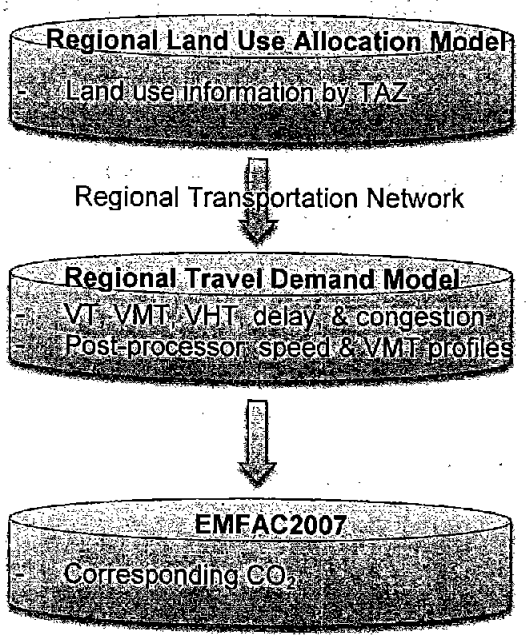
Mode	Average Trip Length (miles)	
	BCAG (2010)	NHTS (2009)
Auto	6.58	9.72

Compared to the average vehicle trip length indicated in the National Household Travel Survey (2009), the BCAG average trip is lower. This may be due to the physical size of the County. BCAG's consultant explains that in modeling interregional trips (i.e. IX/XI trips), the model trip lengths are measured up to the Butte County boundary because this approach is sufficient for air pollution analysis purpose within BCAG region. As a result, the model trip lengths of interregional trips do not reflect the entire length of the trips. Similar modeling approaches for interregional trips are used by some other California MPOs.

IV.MODELING TOOLS

BCAG utilizes three modeling tools to quantify GHG emissions that would result from the implementation of its 2012 MTP/SCS (Figure 9). The three modeling tools are the BCAG Regional Land Use Allocation Model, the BCAG Regional Travel Demand Model, and the Air Resources Board 2007 Emission Factor (EMFAC2007) model. BCAG uses the land use allocation model to develop land use scenarios for years 2020 and 2035.

Figure 9: Flowchart of BCAG's Modeling Process



BCAG then uses the land use allocation model outputs by traffic analysis zone (TAZ) and the regional transportation network as inputs to the travel demand model to forecast travel activity. The outputs of the travel demand model are vehicle trip, vehicle miles traveled (VMT), vehicle hours of travel (VHT), delay, and congestion. A post-processor is then used to divide the VMT outputs into 13 separate speed bins set at five mile per hour intervals as a preparation process for running EMFAC2007. Lastly, BCAG estimates base and forecasted years' CO_2 emissions using EMFAC2007. The inputs and assumptions used in the modeling process of the land use allocation model and travel demand model were reviewed following the ARB evaluation methodology.

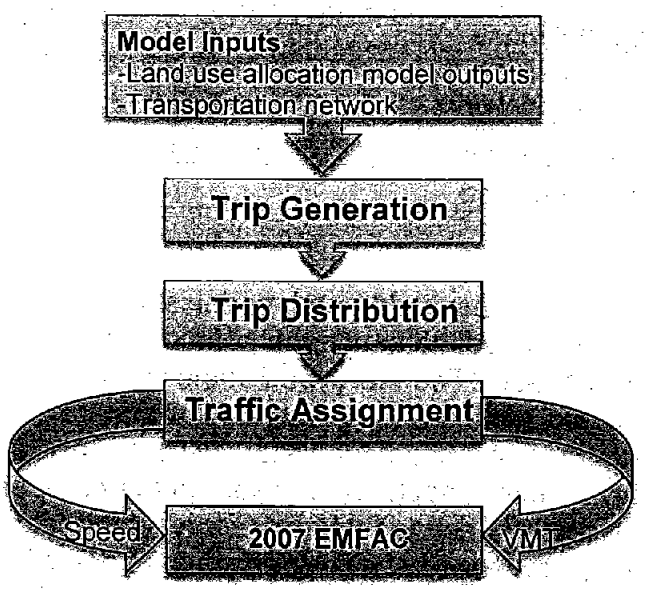
A. Land Use Allocation Model

The BCAG land use allocation model allocates future residential and employment growth while considering the region's existing land use plans, growth forecasts, and development attractions and discouragements. The land use allocation model was updated with land use data for year 2010, and was used to develop land use scenarios for the forecasted years. For each land use scenario, growth was modeled separately for the BCAG member jurisdictions: Chico, Paradise, Oroville, Gridley, Biggs, and the remaining unincorporated area of Butte County. Each jurisdiction was split into the five previously described Growth Area Types: center, established, new, rural, and agricultural growth areas. Land use assumptions, such as dwelling units per acre, average square footage per employee, floor area ratio, mixed use ratio, were developed for where new growth would be assigned. The land use allocation forecast was based on the considerations of regional guiding principles and growth forecasts, current and proposed land use plans, modeled attractions and discouragements, and input from local jurisdiction planners, and public outreach. The forecasted residential and employment results for base and forecasted years by TAZ then served as inputs to the travel demand model.

B. Travel Demand Model

The BCAG Travel Demand Forecasting (TDF) model is a three-step model consisting of trip generation, trip distribution, and trip assignment (Figure 10).

Figure 10: Flowchart of the Trip-Based Travel Demand Model



Trip Generation

The trip generation step consists of the residential trip generation and non-residential trip generation. The residential trip generation estimates trip rates associated with single family and multi-family by household size, number of workers, and household income. These household characteristics were obtained from the 2000 US Census database.

Household vehicle trips were grouped by trip purpose: home-based work (HBW), home-based other (HBO), non-home-based (NHB), home-base school (HB-School), and home-based casino (HB-Casino). BCAG staff utilized statistics from the California Household Travel Survey (2001) to split trips by purpose. BCAG vehicle trip rates are based on person-trip rates from the Sacramento Area Council of Governments' SACMET travel demand forecast model.

The estimated vehicle trips were then divided by the number of occupied residential units to obtain vehicle trip rate at an aggregate level. For the non-residential trip generation sub-model, BCAG started with the national averages of vehicle trip generation rates for a variety of land uses in suburban locations, such as serving retail, industrial, office, hospital, hotels, school, and park. These trip rates were then calibrated for major non-residential land uses within Butte County.

The Federal Highway Administration's Transportation Model Improvement Program (TMIP) and National Highway Cooperative Research Program guidelines suggest that, prior to balancing, the number of productions and attractions should match to within plus or minus 10%. Based on the results presented in Table 14, BCAG's model results meet the guidelines for HBW, HBO, and NHB trips.

Table 14: Production to Attraction Ratio by Trip Purpose

Trip Purpose	Production to Attraction Ratio	Acceptable Range
Home-based work	0.98	0.90 to 1.10
Home-based other	0.99	
Non-home-based	1	

Trip Distribution

The second stage of the BCAG travel demand model is the trip distribution sub-model, which determines the specific destination of each of the vehicle trips that are estimated by the trip generation sub-model. The four types of trips in this sub-model are intra-zonal trips (I-I), internal-external trips (I-X), external-internal trips (X-I), and external-external trips (X-X). The trip distribution sub-model utilizes a gravity model[5] equation to estimate an accessibility index for each zone based on the number of attractions in each zone and a friction factor. Friction factors are travel time factors, which are used in calculating the relative attractiveness of each destination zone and the number of potential origins and destinations in each TAZ. BCAG uses the friction factors suggested in National Cooperative Highway Research Program Report 365.

Traffic Assignment

The trip assignment step assigns the route that each vehicle trip takes from the origin to destination. The traffic assignment sub-model is designed to be sensitive to the effects of congestion; and selects the shortest travel time for each vehicle trip. This sub-model incorporates an iterative, capacity-restrained assignment, and volume adjustment for results to approach equilibrium. Four time periods are used in traffic assignment: AM peak period (6:00 am to 9:00am), mid-day period (9:00 am to 4:00 pm), PM peak period (4:00 pm to 7:00 pm) and off-peak period (7:00 pm to 6:00 am).

Model Validation and Model Improvement

Model validation examines how well the outputs of a travel demand model match with observed travel data in the base year. During the model validation process, BCAG calibrated the travel demand model inputs to match observed travel data. The 2010 California Transportation Commission's Regional Transportation Plan guidelines recommend both static[6] and dynamic[7] model validation to be performed for a region the size of the Butte County (see Appendix A for more details). The results of the daily model's static validation test are summarized in Table 15. The daily model outputs are within the acceptable range suggested by the CTC's RTP guidelines.

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[5] A gravity model assumes that urban places will attract travel in direct proportion to their size in terms of population and employment, and in inverse proportion to travel distance.

[6] Static validation tests compare the model's prediction of traffic volumes against existing traffic counts.

[7] Dynamic validation tests evaluate the model's response to changes in land use and transportation system assumptions.

Table 15: Base Year Static Model Validation Results of the Daily Model

Validation Item	BCAG's Model Result	CTC's RTP Guideline Criteria for Acceptance
Percent of Links within Allowable Deviation	81%	≥75%
Correlation Coefficient	0.93	≥0.88
Percent Root Mean Squared Error (% RMSE)	31%	≤40%

Note: The deviation is the difference between the model volume and the actual count divided by the actual count. It is an indication of the correlation between the actual traffic counts and the estimated traffic volumes from the model. RMSE is the square root of the model volume minus the actual count squared divided by the number of the counts.

In addition to the static validation suggestions given in the CTC guidelines, BCAG checked the model-wide volume-to-count ratio against a designed maximum threshold of no more than ten percent deviation; the result, -5%, is within BCAG's designed range.

For dynamic validation, BCAG changed variables associated with land use or the transportation network to examine whether its model could produce reasonable VMT figures. In general, the dynamic validation outputs show consistent directional changes as expected. For example, when roadway capacity increases or decreases, the corresponding VMT goes up or down, respectively.

Compared to the previous version of the travel demand model, BCAG's new travel demand forecast now captures residential and non-residential vacancy rates and is more sensitive to the cost of travel, smart growth development, and changes to the transit system. Under the 2010 CTC travel model grouping guidelines, BCAG is classified as Group B region, which allows for the use of a three-step model. Overall, this travel demand model is consistent with the requirements in the 2010 CTC Regional Transportation Guidelines.

C. EMFAC Model

ARB's Emission Factor model (EMFAC2007) is a California-specific computer model which calculates weekday emissions of air pollutants from all on-road motor vehicles including passenger cars, trucks, and buses for calendar years 1965 to 2040. The model estimates exhaust and evaporative hydrocarbons, carbon monoxide, nitrogen oxides, particulate matter, oxides of sulfur, lead, methane, and CO_2 emissions. It uses vehicle activity provided by regional transportation planning agencies, and emission rates developed from testing of in-use vehicles. The model estimates emissions at the statewide, county, air district, and air basin levels. Types of emission processes included in EMFAC 2007 are running exhaust, idle exhaust, starting exhaust, diurnal, resting loss, hot soak, running losses, tire wear, and brake wear. To estimate per capita

CO_2 emissions, BCAG estimated total VMT and speed profiles for the region using its travel demand model, and then applied them to the EMFAC2007 model. EMFAC2007 calculated the emissions based on total VMT, VMT distribution by vehicle class, and speed distribution.. The estimated total weekday CO_2 emissions for year 2005, 2010, 2020, and 2035 were converted to obtain per capita CO_2 emissions.

V. LAND USE PERFORMANCE INDICATOR

ARB staff evaluated residential density as a qualitative performance indicator of whether the SCS could meet its GHG targets if implemented. The evaluation uses empirical studies on residential density that illustrate qualitatively how changes in residential density can increase or decrease VMT and/or GHG emissions. ARB staff's review focuses on changes in passenger vehicle GHG emissions reductions from development patterns assumed in the balanced land use scenario.

Residential density is a measure of the average number of dwelling units per acre of developed land. BCAG's SCS anticipates a change in travel characteristics in the region as the housing market shifts from single unit homes on larger lots, to single unit homes on smaller lots, townhomes, and multi-family housing. These changes in travel behavior include reductions in average trip length and decreased regional VMT. The Butte region currently has about 96,623 dwelling units. Roughly 75% are single-family homes with densities ranging anywhere from thirteen units per acre in the urban areas to one unit per 160 acres in timber and agricultural areas. The other 25% are multi-family dwelling units, built at densities ranging from 13 to 50 units per acre.

The Butte SCS reports an average residential density of 1.59 housing units per acre in 2010. By 2020, that figure increases to 1.62 units per acre and increases again in 2035 to 1.7 units per acre. This represents an increase of 0.11 housing units per acre between 2010 and 2035. During the same period, the Butte SCS also reports a regional per capita VMT decrease of 0.03%.

A review of relevant empirical literature reveals supports this observation. Brownstone and Golob analyzed National Household Travel Survey (NHTS) data and observed that denser housing development significantly reduces annual vehicle mileage and fuel consumption, which directly results in the reduction in GHG emissions. They also reported that households in areas with 1,000 or more units per square mile drive 1,171 fewer miles and consume 64.7 fewer gallons of fuel than households in less dense areas. Boarnet and Handy (2010) reported that doubling residential density reduces VMT an average of 5 to 12 percent. Manville and Shoup (2005) reported that a 1% population density increase is associated with a 0.58% reduction in VMT in a survey of twenty urbanized areas. As Boarnet and Handy (2010) report, due to the urban focus in the literature, it is important to note that there is little evidence that explores in any specificity on the way that residential density interacts with VMT in rural areas.

While the levels of increased residential density in Butte are relatively low, they are directionally consistent with what the literature would indicate as resulting in reduced

vehicle miles traveled and thus greenhouse gas emissions. These increases in density are consistent with the empirical literature indicating likely reductions in VMT and auto trip length, shifts in travel mode away from single occupant vehicles, and reductions in GHG emissions.

VI. CONCLUSION

This report documents ARB staff's technical review of the draft plan together with its subsequent review of the adopted MTP/SCS. This review affirms that BCAG's adopted SCS demonstrates that, if implemented, the region will achieve a 2 percent passenger vehicle greenhouse gas per capita reduction in 2020, and a 2 percent reduction in 2035. These reductions meet the targets established for BCAG of 1 percent and 1 percent GHG per capita increase from 2005 for the years 2020 and 2035, respectively.

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Appendix A: 2010 CTC RTP Guidelines Addressed in BCAG's MTP

This Appendix describes the requirements in the CTC Guidelines that are applicable to the BCAG regional travel demand model, as well as the recommendations that BCAG incorporated into the model.

Requirements	1. Each MPO shall model a range of alternative scenarios in the RTP Environmental Impact Report based on the policy goals of the MPO and input from the public. 2. MPO models shall be capable of estimating future transportation demand at least 20 years into the future. (Title 23 CFR Part 450.322(a)) 3. For federal conformity purposes, each MPO shall model criteria pollutants from on-road vehicles as applicable. Emission projections shall be performed using modeling software approved by the EPA. (Title 40 CFR Part 93.111(a)) 4. Each MPO shall quantify the reduction in greenhouse gas emissions projected to be achieved by the SCS. (California Government Code Section 65080(b)(2)(G)) 5. The MPO, the state(s), and the public transportation operator(s) shall validate data utilized in preparing other existing modal plans for providing input to the regional transportation plan. In updating the RTP, the MPO shall base the update on the latest available estimates and assumptions for population, land use, travel, employment, congestion, and economic activity. The MPO shall approve RTP contents and supporting analyses produced by a transportation plan update. (Title 23 CFR Part 450.322(e)) 6. The metropolitan transportation plan shall include the projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan. (Title 23 CFR Part 450.322(f)(1))
Recommendations	1. The use of three-step models can continue for the next few years. The models should be run to a reasonable convergence towards equilibrium. 2. The models should account for the effects of land use characteristics on travel, either by incorporating effects into the model process or by post-processing. 3. During the development period of more sophisticated/detailed models, there may be a need to augment current models with other methods to achieve reasonable levels of sensitivity. Post-processing should be applied to adjust model outputs where the models lack capability, or are insensitive to a particular policy or factor. The most commonly referred to post-processor is a "D's" post-processor, but post-processors could be developed for other non-D factors and policies, too. 4. The models should address changes in regional demographic patterns. 5. Geographic Information System (GIS) capabilities should be developed in these counties, leading to simple land use models in

	a few years. 6. All natural resources data should be entered into the GIS. 7. Parcel data should be developed within a few years and an existing land use data layer created. 8. For the current RTP cycle (post last adoption), MPOs should use their current travel demand model for federal conformity purposes, and a suite of analytical tools, including but not limited to, travel demand models (as described in Categories B through E), small area modeling tools, and other generally accepted analytical methods for determining the emissions, VMT, and other performance factor impacts of sustainable communities strategies being considered pursuant to SB 375. 9. Measures of means of travel should include percentage share of all trips (work and non-work) made by all single occupant vehicle, multiple occupant vehicle, or carpool, transit, walking, and bicycling. 10. To the extent practical, travel demand models should be calibrated using the most recent observed data including household travel diaries, traffic counts, gas receipts, Highway Performance Monitoring System (HPMS), transit surveys, and passenger counts. 11. It is recommended that transportation agencies have an on-going model improvement program to focus on increasing model accuracy and policy sensitivity. This includes on-going data development and acquisition programs to support model calibration and validation activities. 12. For models with a mode choice step, if the travel demand model is unable to forecast bicycle and pedestrian trips, another means should be used to estimate those trips. 13. When the transit mode is modeled, speed and frequency, days, and hours of operation of service should be included as model inputs. 14. When the transit mode is modeled, the entire transit network within the region should be represented. 15. Agencies are encouraged to participate in the California Inter-Agency Modeling Forum. This venue provides an excellent opportunity to share ideas and help to ensure agencies are informed of current modeling trends and requirements. 16. MPOs should work closely with state and federal agencies to secure additional funds to research and implement the new land use and activity-based modeling methodologies. Additional research and development is required to bring these new modeling approaches into mainstream modeling practice.

Appendix B: Modeling Parameters for SCS Evaluation (Data Table)

This appendix contains BCAG's responses to data requests, received on December 12, 2012, to supplement ARB staff's evaluation of BCAG's quantification of GHG emissions. ARB requested this data in accordance with the general approach described in ARB's July 2011 evaluation methodology document (or the modified evaluation methodology document).

Modeling Parameters	2005	2010 (base year)	2020 (With Project)	2020 (Without Project)	2035 (With Project)	2035 (Without Project)	Data Source(s)
DEMOGRAPHIC							
Total population[i]	214,582	221,768	257,266	---	332,459	---	BCAG Regional Growth Forecasts, State of California, and 2012 MTP/SCS - Chapter 6
Group quarters	---	---	---	---	---	---	
Total number of households[i]	85,478	90,405	108,095	---	139,686	---	
Persons per household	2.44	2.38	2.38	---	2.38	---	
Auto ownership per household	---	---	---	---	---	---	
Total number of jobs (Non-Farm)[ii]	73,400	71,501	87,214	---	112,279	---	
Average unemployment rate (%)	---	---	---	---	---	---	
Average household income ($)	---	---	---	---	---	---	
LAND USE							
Total housing/dwelling units[i]	91,666	96,623	111,813	---	143,948	---	Same as above
Total acreage developed	---	60,655	69,078	---	84,703	---	BCAG Regional Land Use Allocation Model and Geographic Information System (GIS)
Total acreage in region	1,172,912						
Total acreage available for new development	---	---	---	---	---	---	
Percent housing within 1/4 mile of transit stations/stops	---	---	---	---	---	---	
Percent housing within 1/2 mile of existing transit route	---	75%	74%	---	69%	---	
Percent employment within 1/4 mile of transit stations/stops	---	---	---	---	---	---	
Percent employees within 1/2 mile of transit stations/stops	---	87%	85%	---	83%	---	
Multi-family housing units	---	25%	25%	---	26%	---	
Single family housing units	---	75%	75%	---	74%	---	
Total Housing Units by Growth Area							BCAG Regional Land Use Allocation Model, GIS, and 2012 MTP/SCS - Chapter 6
Urban Center and Corridor	---	8,375	9,212	---	11,135	---	
Established	---	73,639	84,599	---	100,131	---	
New	---	440	2,264	---	14,299	---	
Rural	---	7,829	8,784	---	10,753	---	
Agricultural, Grazing, and Forestry	---	6,340	6,953	---	7,629	---	

Modeling Parameters	2005	2010 (base year)	2020 (With Project)	2020 (Without Project)	2035 (With Project)	2035 (Without Project)	Data Source(s)
Total Employees by Growth Area	---	---	---	---	---	---	BCAG Regional Land Use Allocation Model, GIS, and 2012 MTP/SCS - Chapter 6
Urban Center and Corridor	---	30,471	33,534	---	40,275	---	
Established	---	37,535	48,672	---	61,108	---	
New	---	1,277	2,170	---	7,506	---	
Rural	---	950	1,379	---	1,852	---	
Agricultural, Grazing, and Forestry	---	1,268	1,460	---	1,539	---	
Acreage of land zoned (used and available) for mixed use	---	---	---	---	---	---	---
Average residential density – (housing units/total acreage developed)	---	1.59	1.62	---	1.70	---	BCAG Regional GIS
TRANSPORTATION SYSTEM							
Freeway general purpose lanes — mixed flow, auxiliary, etc. (lane miles)	---	189	194	---	196	---	BCAG Regional GIS
Freeway managed lanes--HOV, HOT, Tolled, etc. (lane miles)	---	---	---	---	---	---	
Arterial / Expressway (lane miles)	---	731	773	---	810	---	
Collector and Local (lane miles)	---	6,276	6,277	---	6,276	---	
Regular transit bus operation Miles [iii]	---	333	333	---	333	---	
Bus rapid transit bus operation miles	---	---	---	---	---	---	
Express bus operation miles	---	---	---	---	---	---	
Transit rail operation miles	---	---	---	---	---	---	
Bike lane (class I & II) miles [iv]	---	78	88	---	88	---	
Miles of sidewalk	---	---	---	---	---	---	

Modeling Parameters	2005	2010 (base year)	2020 (With Project)	2020 (Without Project)	2035 (With Project)	2035 (Without Project)	Data Source(s)
TRIP DATA							
Number of Vehicle trips by trip purpose							BCAG Regional Travel Demand Model
- Home-based work	146,044	150,801	174,453	---	222,507	---	
- Home-based school	58,547	60,576	69,914	---	89,628	---	
- Home-based college	---	---	---	---	---	---	
- Home-based shopping	---	---	---	---	---	---	
- Home-based recreational	---	---	---	---	---	---	
- Home-based casino	7,866	7,866	9,613	---	12,586	---	BCAG Regional Travel Demand Model
- Home-based others	344,670	355,381	411,342	---	508,654	---	
- Non home-based	167,826	166,026	192,578	---	235,737	---	
By trip purpose							
Average auto trip length (miles)	6.56	6.58	6.72	---	6.88	---	BCAG Regional Travel Demand Model
Average walk trip length (miles)	---	---	---	---	---	---	
Average bike trip length (miles)	---	---	---	---	---	---	
Average transit trip length (miles)	---	---	---	---	---	---	
Average auto travel time (minutes)	10.45	10.47	10.68	---	10.77	---	
Average walk travel time (minutes)	---	---	---	---	---	---	
Average bike travel time (minutes)	---	---	---	---	---	---	
Average transit travel time (minutes)	---	---	---	---	---	---	

Modeling Parameters	2005	2010 (base year)	2020 (With Project)	2020 (Without Project)	2035 (With Project)	2035 (Without Project)	Data Source(s)
PERCENT PASSENGER TRAVEL MODE SHARE (whole day)							
Auto	---	92.75%	91.41%	---	91.38%	---	BCAG Regional Travel Demand Model
All Other (transit & non-motorized)	---	7.25%	8.59%	---	8.62%	---	
SOV	---	---	---	---	---	---	
HOV	---	---	---	---	---	---	
HOT	---	---	---	---	---	---	
Public transit (Regular Bus)	---	---	---	---	---	---	
Public transit (Express Bus)	---	---	---	---	---	---	
Public transit (BRT)	---	---	---	---	---	---	
Public transit (Rail)	---	---	---	---	---	---	
Non-Motorized: Bike	---	---	---	---	---	---	
Non-Motorized: Walk	---	---	---	---	---	---	
PERCENT PASSENGER TRAVEL MODE SHARE (peak period)							
SOV	---	---	---	---	---	---	---
HOV	---	---	---	---	---	---	---
HOT	---	---	---	---	---	---	---
Public transit (Regular Bus)	---	---	---	---	---	---	---
Public transit (Express Bus)	---	---	---	---	---	---	---
Public transit (BRT)	---	---	---	---	---	---	---
Public transit (Rail)	---	---	---	---	---	---	---
Non-Motorized: Bike	---	---	---	---	---	---	---
Non-Motorized: Walk	---	---	---	---	---	---	---

Modeling Parameters	2005	2010 (base year)	2020 (With Project)	2020 (Without Project)	2035 (With Project)	2035 (Without Project)	Data Source(s)
VEHICLE MILES TRAVELED							
Total VMT per weekday for passenger vehicles (ARB vehicle classes of LDA, LDT1, LDT2 and MDV) (miles)	3,797,148	3,861,151	4,587,012	---	5,998,796	---	BCAG Regional Travel Demand Model and EMFAC 2007
Total II VMT per weekday for passenger vehicles (miles)	2,568,643	2,637,476	3,162,690	---	4,367,722	---	
Total IX/XI VMT per weekday for passenger vehicles (miles)[v]	1,099,357	1,095,524	1,234,310	---	1,313,278	---	
Total XX VMT per weekday for passenger vehicles (miles)	129,148	128,151	190,012	---	317,796	---	
CONGESTED TRAVEL MEASURES							
Congested weekday VMT on freeways (V/C ratios >1.0)	0	0	0	---	0	---	BCAG Regional Travel Demand Model
Congested weekday VMT on all other roadways (V/C ratios >1.0)	15,032	31,850	99,036	---	333,551	---	
CO2 EMISSIONS[vi]							
Total CO2 emissions per weekday for passenger vehicles (ARB vehicle classes LDA, LDT1, LDT2, and MDV) (tons)	1,832	1,862	2,170	---	2,840	---	BCAG Regional Travel Demand Model and EMFAC 2007
Total II + IX / XI trip CO2 emissions per weekday for passenger vehicles (tons)	1,770	1,800	2,080	---	2,690	---	
Total XX trip CO2 emissions per weekday for passenger vehicles (tons)	62	62	90	---	150	---	

Modeling Parameters	2005	2010 (base year)	2020 (With Project)	2020 (Without Project)	2035 (With Project)	2035 (Without Project)	Data Source(s)
INVESTMENT (thousands in 2012$)							
Total Investment ($)	---	---	498,002	---	998,129	---	2012 MTP/SCS - Financial Element (Chapter 13)
Highway capacity expansion ($)	---	---	35,694	---	122,776	---	
Other road capacity expansion ($)	---	---	0	---	0	---	
Road and Highway maintenance and operations ($)	---	---	287,339	---	546,606	---	2012 MTP/SCS - Financial Element (Chapter 13)
Transit capital ($)	---	---	31,290	---	51,582	---	
Transit operations ($)	---	---	64,147	---	163,930	---	
Rail projects ($)	---	---	550	---	1,406	---	
Bike and pedestrian projects ($)	---	---	12,421	---	26,597	---	
Aviation projects ($)	---	---	59,017	---	67,282	---	
Planning projects ($)	---	---	7,545	---	17,949	---	
Other ($)	---	---	---	---	---	---	---
TRANSPORTATION USER COSTS AND PRICING							
Vehicle operating costs ($ per mile)	---	---	---	---	---	---	---
Gasoline price ($ per gallon)	---	---	---	---	---	---	---
Parking price ($ per day)	---	---	---	---	---	---	---
Toll price ($)	---	---	---	---	---	---	---
Congestion price ($ per mile)	---	---	---	---	---	---	---

[i] 2005 and 2010 data sources: State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento, California, May 2010.

[ii] 2005 and 2010 data sources: State of California, Employment Development Department, Butte County Industry Employment & Labor Force, March 2009 Benchmark. Sacramento, California, June 18, 2010.

[iii] Transit miles are a measure of service coverage, not service intensity. Reported figures represent the combined mileage of routes, not including frequency. The 2012 MTP/SCS does not include forecasted transit routing.

[iv] 2012 MTP/SCS does not forecast bicycle facility improvements beyond the 2013 FTIP horizon year of 2015/16.

[v] IX-XI VMT and CO2 were "split" at MPO boundary, per agreement with SACOG.

[vi] CO2 emissions were prepared in EMFAC 2007 for the II + IX/XI row only. Total and XX rows are estimated based on the ratio of VMT to CO2 for each analysis year.

PROPOSED

State of California
AIR RESOURCES BOARD

Acceptance of Greenhouse Gas Quantification Determination for the Butte County Association of Governments' SB 375 Sustainable Communities Strategy

Resolution 13-17

April 25, 2013

Agenda Item No.: 13-5-3

WHEREAS, SB 375 (Steinberg, Chapter 728, Statutes of 2008), also known as the Sustainable Communities and Climate Protection Act, aims to reduce greenhouse gas (GHG) emissions from passenger vehicle travel through improved transportation and land use planning at the regional scale;

WHEREAS, SB 375 requires each of the State's 18 federally-designated Metropolitan Planning Organizations (MPO), including the California portion of the Tahoe Metropolitan Planning Organization, to develop a Sustainable Communities Strategy (SCS) or an Alternative Planning Strategy (APS) that meets the regional GHG emission reduction targets for passenger vehicles (targets) set by the Air Resources Board (ARB or Board);

WHEREAS, on September 23, 2010, the Board approved GHG emission reduction targets for 2020 and 2035, expressed as a per capita percentage reduction relative to 2005 levels, for each of the State's MPOs;

WHEREAS, the targets established for the Butte County Association of Governments (BCAG) region are a one percent per capita increase in 2020 and a one percent per capita increase in 2035 relative to 2005 levels;

WHEREAS, BCAG staff engaged the public by holding three rounds of public workshops between August 2011 and October 2012;

WHEREAS, in September 2012, BCAG published a draft Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for 2012-2035 that stated it would achieve a two percent per capita reduction from 2005 in 2020 and a two percent per capita reduction from 2005 in 2035;

WHEREAS, ARB staff performed a technical evaluation of the draft SCS using ARB's methodology, published in July 2011, for review of GHG emission calculation procedures for SCS plans;

WHEREAS, ARB staff's evaluation found that BCAG used technical methodologies that would accurately quantify GHG reductions from the draft SCS;

WHEREAS, the BCAG Board of Directors adopted the final MTP/SCS at its public meeting on December 13, 2012;

WHEREAS, as required by California Government Code section 65080(b)(2)(J)(ii), BCAG submitted the final SCS to ARB on December 17, 2012 for review of its GHG quantification determination of a two percent per capita reduction by 2020 and a two percent per capita reduction by 2035;

WHEREAS, section 65080(b)(2)(J)(ii) of the California Government Code calls for ARB to accept or reject an MPO's determination that its submitted strategy would, if implemented, achieve the GHG emission reduction targets established by the Board;

WHEREAS, ARB staff's technical evaluation of BCAG's GHG reduction quantification determination is contained in Attachment A, "Technical Evaluation of Greenhouse Gas Emission Reduction Quantification for the Butte County Association of Governments' Sustainable Communities Strategies," dated April 2013; and

WHEREAS, ARB staff's evaluation affirms that BCAG's adopted 2012-2035 SCS would, if implemented, achieve more reductions than the GHG targets that the Board established for the region for 2020 and 2035.

NOW, THEREFORE, BE IT RESOLVED that pursuant to section 65080(b)(2)(J)(ii) of the California Government Code, the Board hereby accepts BCAG's quantification of the GHG emission reductions from the final SCS adopted by the BCAG Board of Directors on December 13, 2012, and the MPO's determination that the SCS would, if implemented, achieve a two percent per capita GHG reduction from 2005 levels in 2020 and 2035.

NOW, THEREFORE, IT IS ORDERED that ARB staff is directed to forward this Resolution to the BCAG Board of Directors and Executive Director.

Resolution 13-17

April 25, 2013

Identification of Attachment to the Board Resolution

Attachment A: "Technical Evaluation of Greenhouse Gas Emission Reduction Quantification for the Butte County Association of Governments' Sustainable Communities Strategy," April 2013.

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER DRAFT AB 32 CAP-AND-TRADE AUCTION PROCEEDS INVESTMENT PLAN: FISCAL YEARS 2013-14 THROUGH 2015-16

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider a draft investment plan for auction proceeds from the Cap-and-Trade program to reduce greenhouse gas (GHG) emissions pursuant to AB 32.

DATE: April 25, 2013

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

BACKGROUND

In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32 (AB 32); Stats. 2006, chapter 488). AB 32 created a comprehensive, multi-year program to reduce GHG emissions in California to 1990 levels by 2020, and to maintain and continue reductions beyond 2020. In March 2012, Governor Brown signed Executive Order B-16-2012 affirming a long-range climate goal for California to reduce greenhouse gases from transportation to 80 percent below 1990 levels by 2050.

The AB 32-mandated Scoping Plan (2008) contains a comprehensive array of strategies to reduce GHGs, including the Cap-and-Trade Regulation. The Cap-and-Trade Regulation is a key element of the Scoping Plan by: creating a limit on the emissions from sources responsible for 85 percent of California's GHG emissions; establishing the price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy, and providing covered entities flexibility to implement the lowest-cost options to reduce emissions.

Cap-and-Trade Auctions

The first Cap-and-Trade auctions were held on November 14, 2012 and February 19, 2013, respectively. Subsequent auctions will be conducted quarterly. The majority of auction proceeds derive from the sale of allowances consigned to auction by investor-owned utilities, and those proceeds are required by the California Public Utilities Commission to be directed to benefit rate-payers. The more limited State portion of the proceeds from the auction is deposited in the Greenhouse Gas Reduction Fund (created

pursuant to Government Code section 16428.8) to support programs that further the regulatory purposes of AB 32.

Legislative Direction for Cap-and-Trade Auction Proceeds

In 2012, the Legislature passed and Governor Brown signed into law three bills— AB 1532 (Pérez, Chapter 807), Senate Bill (SB) 535 (De León, Chapter 830), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39) (collectively referred to hereinafter as the "implementing legislation")— that together establish a framework for developing an investment plan for projects and programs to be funded with Cap-and-Trade auction proceeds. SB 535 further requires that 25 percent of the proceeds that will be expended benefit disadvantaged communities and at least 10 percent of the proceeds expended be invested in projects located within those communities.

The implementing legislation establishes a two-step process for allocating funding to State agencies, with Department of Finance (Finance) as the lead agency. The first step is developing a three-year investment plan which Finance, in consultation with ARB and other State agencies, must develop and submit to the Legislature. The second step is the appropriation of funds to State agencies by the Legislature and Governor through the annual Budget Act, consistent with the three-year investment plan and in furtherance of the purposes of AB 32.

Requirements for the Investment Plan

The investment plan must identify near-term and long-term greenhouse gas emission reduction goals and targets; analyze gaps in current state strategies for meeting greenhouse gas reduction goals; and identify priority investments that facilitate greenhouse gas reductions. Prior to Finance submitting a final investment plan to the Legislature, ARB must hold at least two public workshops and a public hearing in coordination with Finance and the Climate Action Team.

Governor's Budget Proposal

On January 10, 2013, the Governor released a proposed budget for Fiscal Year 2013-14, which described his priorities for the investment of the state portion of the auction proceeds. These priorities targeted transportation and energy as the two sectors with the largest contributors to GHG emissions in California. The proposed budget focused on clean transportation and sustainable communities, and energy efficiency and clean energy, as priority areas for investment to address these sectors. The Governor's proposal also noted other areas that should be examined during the planning process, including natural resources and waste diversion.

DESCRIPTION OF THE CAP-AND-TRADE AUCTION PROCEEDS DRAFT INVESTMENT PLAN

As defined in the implementing legislation, the draft investment plan was developed by Finance in consultation with ARB and other State agencies. The purpose of the draft investment plan is to discuss the applicable requirements associated with the investment of auction proceeds and identify priority investments that will achieve greenhouse gas reductions and yield valuable co-benefits. As required, the draft investment plan: identifies near-term and long-term greenhouse gas emission reduction goals and targets; analyzes gaps in current State strategies for meeting greenhouse gas reduction goals; and identifies priority investments that facilitate greenhouse gas reductions. In addition, the plan provides maps to assist in identifying disadvantaged communities pursuant to SB 535, as well as a framework to implement priority investments. The plan also outlines suggested accountability principles for the funding, which are critical to ensure all funding is appropriated to further the purposes of AB 32 and to be consistent with state law.

Before releasing this draft investment plan, Administration representatives held a public consultation meeting in May 2012 to hear advice from experts and input from the public about approaches to investing auction proceeds. In February 2013, Finance and ARB released a draft Concept Paper on the investment of auction proceeds for public comment. Representatives from the Administration, including several representatives of the Climate Action Team then participated in three public workshops on the development of the investment plan on February 19, 2013 in Fresno, on February 25, 2013 in Sacramento, and on February 27, 2013 in Los Angeles to obtain additional public input on the Concept Paper and supplemental material presented at the events. Approximately 200 people spoke at the workshops and over 300 individuals or organizations submitted written comments. Commenters represented a broad array of different interests advocating for investment in a wide range of project areas including clean transportation, sustainable communities, energy efficiency, clean energy, natural resource management and preservation, agriculture, waste management and diversion, and disadvantaged community-focused projects.

Based on consultation with representatives from the Governor's Office and members of the Climate Action Team, and in consideration of public input from the workshops, the draft investment plan provides recommended priority investments for consideration by the Legislature during annual budget appropriation process. The intent is to provide information on potential investments that further the purposes of AB 32 and meet the requirements of the implementing legislation. Inclusion of a recommended investment in the plan does not guarantee funding. Ultimately, the Governor and Legislature will decide which programs will be funded and the level of funding, consistent with the final investment plan to be submitted by Finance pursuant to AB 1532.

This draft investment plan covers a three-year period, so some programs may not be funded until the second or third year of the plan. During the first year of this plan (FY 2013-14), it will be more effective to focus on enhancing existing programs and a

limited number of large projects while the overall investment program ramps up. This will allow time for agencies to get their programs ready for second or third year funding opportunities and will help ensure consistency with this investment plan and the purposes of AB 32.

Potential investments with auction proceeds must support reductions in greenhouse gas emissions. These investments should also be expected to deliver multiple co-benefits to protect our human and natural resources.

AVAILABILITY OF DOCUMENTS

The *Draft Cap-and-Trade Auction Proceeds Investment Plan: Fiscal Years 2013-14 through 2015-16* will be presented at the hearing. Copies of the draft may be obtained from ARB's Public Information Office, 1001 I Street, First Floor, Environmental Services Center, Sacramento, California, 95814, (916) 322-2990. The draft may also be obtained from the Program website at http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auctionproceeds.htm

SUBMITTAL OF COMMENTS

Interested members of the public may present comments orally or in writing at the hearing and may provide comments by postal mail or by electronic submittal before the hearing. To be considered by the Board, written comments not physically submitted at the hearing must be received **no later than 12:00 noon, April 24, 2013**, and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

You can sign up online in advance with a request to speak at the Board hearing when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

Further inquiries regarding this matter should be directed to Ms. Shelby Livingston, Chief, Climate Change Program Planning and Management Branch, at (916) 324-0934.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del dia programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: April 16, 2013

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.