

**Air Resources Board
Preliminary Draft Staff Report
SB 375 Greenhouse Gas Emissions Reduction Target Update Process**

August 2014

California Environmental Protection Agency



DRAFT

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.

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I. Preface

The Air Resources Board (ARB or Board) is required to update the Senate Bill 375 (SB 375) greenhouse gas (GHG) emissions reduction targets at least every eight years, and may revise them every four years. The Board established the initial set of targets in late 2010 for each of the 18 Metropolitan Planning Organizations (MPOs) in the State. At that time, the Board requested staff to provide an update every four years to review the progress of target implementation and discuss the need for setting new targets to reflect new data, modeling improvements, and other information relevant to targets.

In January 2014, ARB staff briefed the Board on the status of SB 375 implementation. At that time, the Board directed staff to conduct additional public outreach with stakeholders on a methodology for updating the targets, and return to the Board in the fall for further discussion about a preferred approach for updating the targets.

In April 2014, ARB staff hosted a stakeholder roundtable meeting, at which a number of issues were discussed, including but not limited to modeling improvements to better estimate GHG emissions reductions, appropriate timing for setting revised targets, whether targets needed to be updated for all or for some MPOs, funding for model improvements and plan implementation, and an improved methodology for estimating inter-regional travel. No consensus or recommendations emerged from the April roundtable meeting. A second roundtable meeting is scheduled for September 5, 2014.

To facilitate a discussion of the numerous factors related to a future target update, ARB staff has prepared this preliminary draft staff report describing several issues and options, but does not recommend a preferred approach to updating the targets. In this preliminary draft staff report, staff has attempted to objectively identify the issues that have been raised in the April 2014 roundtable meeting, and in our meetings and conversations with MPOs, stakeholders, and the interested public over the past year. It can also serve as a backdrop to a discussion about the coordination, planning, and funding issues related to the overall SB 375 process.

The primary purpose of this preliminary draft staff report is to serve as a discussion tool for the September 5 roundtable meeting, as well as three public workshops that will be held around the State on September 9, 11, and 17. ARB staff will consider public input received at the September 2014 roundtable meeting and public workshops, and will revise and finalize this report based on that input. The revised staff report will be released to the public and presented to the Board at its regularly scheduled October 2014 meeting.

II. Introduction

California's transportation system accounts for about 36 percent of California's GHG emissions. Passenger vehicles alone contribute 26 percent of California's total GHG emissions.¹ The Sustainable Communities and Climate Protection Act of 2008 (SB 375; Steinberg, Chapter 728, Statutes of 2008) supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning. Based on ARB staff's scenario work for the Advanced Clean Cars (ACC) program, it is clear that we will need additional GHG reductions to come from decreases in vehicle miles traveled (VMT) by 2050 to achieve the State's climate goals.

Pursuant to SB 375, ARB adopted GHG emissions reduction targets (targets) in 2010 applicable to each of the State's 18 MPO regions. The targets were developed through a collaborative process that involved input from the Regional Targets Advisory Committee (RTAC), the MPOs, and numerous other stakeholders. Following input from the RTAC and in consultation with the MPOs, ARB provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks for 2020 and 2035.

SB 375 encourages MPOs and local government partners to develop and evaluate alternative planning scenarios that will offer the region a range of transportation and housing choices. The GHG emissions reduction targets established by ARB serve as one performance measure that MPOs use to evaluate their federally required regional transportation plans (RTP). MPOs are responsible for selecting the appropriate combination of strategies for their RTP based on unique circumstances, stakeholder input, availability of transportation funding, and federal transportation planning requirements.

Land use and transportation strategies contemplated in RTPs prepared by the MPOs are known to influence vehicle travel. Certain types of land use and transportation strategies can result in reductions in VMT and associated GHG emissions. Thus, SB 375 aims to integrate regional transportation planning with land use planning in a manner that reduces GHG emissions from passenger vehicles, and introduced the sustainable communities strategy (SCS) component of the RTP. ARB reviews an MPO's determination of whether the SCS will achieve its assigned GHG emissions reduction target.

¹ California Air Resources Board. 2014. California Greenhouse Gas Inventory for 2000-2012. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-12_2014-03-24.pdf

SB 375 directs ARB to update the targets every eight years, or every four years based on changes in factors such as vehicle emissions standards, fuel composition, or other measures that are anticipated to reduce GHG emissions (GC § 65080(b)(2)(A)(iv)). At the time of this writing, adoption of the first round of RTP/SCSs by MPOs is nearly complete, and the second RTP/SCS planning cycle is already underway in certain regions of the State.

Numerous policy and technical issues and challenges surrounding target achievement have been identified by stakeholders. This paper summarizes stakeholder input received to date, and reviews several important factors that ARB could consider during development of a methodology to update the targets. This staff report presents several alternatives for a target update process and associated methodology that will aid the discussion during a stakeholder meeting and a series of three public workshops hosted by ARB during September 2014. ARB staff will incorporate input received through the workshops, and revise and finalize the staff report prior to the October 2014 presentation to the Board on the target update process.

III. Background

The original Assembly Bill (AB) 32 *Climate Change Scoping Plan*, adopted by ARB in 2008, discussed implementation of SB 375 as one of the mechanisms to reduce GHG emissions from vehicles through coordinated land use and transportation strategies.² When SB 375 was signed into law in 2008, GHG emissions analysis for transportation and land use plans was in its very early stages. Tools and methodology for assessment of GHG emissions were not consistently or widely applied. The RTAC was convened to recommend factors and methodologies for consideration when setting targets for the affected MPO regions.

The RTAC was composed of 21 members with representatives from MPOs; air districts; local governments; transportation agencies; homebuilders; environmental, planning, affordable housing and environmental justice organizations; and members of the public. Recommendations provided in the RTAC's 2009 report included:

- use of a 2005 base year;
- use of an efficiency-based metric: percent reduction in per capita GHG emissions;

² California Air Resources Board. 2008. Climate Change Scoping Plan. http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

- a methodology to allocate cross-MPO VMT to each jurisdiction;
- conservative 2020 targets (because actions that account for the 2020 built environment had largely already been made); and
- acknowledgement of the uncertainty over impacts of the recession.

ARB's first round of adopted targets was developed through a bottom-up process with input from the MPOs about what the MPOs believed they could reasonably achieve. The targets were contemplated and developed in three planning contexts: 1) targets applicable to the four largest MPOs (the Southern California Association of Governments [SCAG], San Diego Association of Governments [SANDAG], Metropolitan Transportation Commission [MTC], and Sacramento Area Council of Governments [SACOG]), which represented most of the State's population and projected growth; 2) targets applicable to the eight county MPOs in the San Joaquin Valley, which individually represent comparatively small populations with many rural communities; and 3) targets applicable to the six remaining MPO regions, which represented a small fraction of the State's total population and transportation emissions.

ARB has received feedback from the MPOs that the RTAC process and initial target setting process was effective. Staff believes that the iterative, bottom-up input process between ARB staff and the MPOs is valuable and should continue in the next round of target setting.

A. Initial SB 375 Success

Although it will take several years before the full extent of the GHG emissions reductions, land use policies, and transportation infrastructure changes programmed in the RTP/SCSs are realized, several positive outcomes have already been reported as a result of SB 375. MPOs and stakeholders report the following early successes of integrating SB 375 requirements into the RTP/SCS planning processes:

- Increased outreach and public participation;
- More engagement and coordination between MPOs and local jurisdictions;
- Advances in transportation modeling and more sophisticated scenario testing, which results in more informed decision making;
- Increased emphasis on infill;
- More funding allocated to public transit and active transportation;
- Organizational principles around which MPOs can rally public support (e.g., development in High Quality Transit Areas and focus on new development in Priority Development Areas); and
- Establishing a framework for multiple healthy community, social equity, and environmental benefits that accompany sustainable communities.

Reducing GHG emissions is one important objective of SB 375, but there are numerous other social equity and environmental benefits for which healthy communities strive that accompany GHG emissions reductions from passenger vehicles. The public discussion around regional SCS planning over the past few years has initiated a broader dialogue about the importance of ensuring that all community members benefit in the following ways.

1. Improved Public Health

A growing share of Californians struggle with various chronic health issues, such as obesity, that could be reduced with greater physical activity. Bicycling and walking, together called active transportation, play a significant role in supporting public health efforts and meeting climate change goals in California. By allocating resources to bicycling and pedestrian planning, Californians are increasingly likely to get out of their cars and opt to walk or bicycle instead. This change helps promote higher quality of life, social interaction, and improved opportunities for exercise.

2. Increase Transportation Modes, Housing Choices, and Equity

By allocating more resources to public transit and active transportation, MPOs and transit providers can offer residents more choices in addition to driving a vehicle. This will be increasingly important for aging populations in California communities that can no longer drive a vehicle, and as car-ownership rates decline among younger populations. In addition, offering a variety of housing types while carefully coordinating housing density with transportation facilities will maximize mode shift and associated GHG emissions reductions. Offering diversity of housing and transit choices promotes socio-economic diversity of neighborhoods, which is known to be important for neighborhood vitality and revitalization. Income diversity can also break up or prevent concentrations of poverty that are viewed as generators of neighborhood decline. If properly designed, investments can benefit all income groups and user groups.

3. Reduced Transportation Costs

A more compact land use pattern can reduce infrastructure costs for local governments as well as reduce transportation costs for residents. Providing options for efficient, high-quality public transit and safe and direct bicycle and pedestrian facilities not only reduces driving and GHG emissions, but also saves residents and employees money by reducing transportation and parking costs.

4. Increased Economic Development

Reduced transportation costs for residents generates additional sources of disposable income, which presents possible economic benefits for businesses in the community. Many types of businesses in a pedestrian-friendly environment report an increase in business associated with potential customers passing by on foot compared with in a vehicle. Businesses and employers are attracted by vibrant communities where people

want to live, where their employees can find affordable housing, and where transportation congestion does not interfere with economic productivity.

5. Reduced Congestion and Improved Air Quality

Reduced driving means fewer vehicles are sitting in traffic congestion, and the transportation system can function more efficiently. A more efficient transportation network can further reduce GHG emissions by optimizing vehicle free flow speeds. Reductions in VMT and tailpipe emissions are accompanied by reductions in particulate matter and ozone-forming pollutants, which improve regional air quality, further improving public health.

6. Open Space and Resource Protection

More compact land use planning presents the benefit of resource protection, including preservation of open space and farmland. Preservation of open space and farmland protects biological and forest resources, can improve water quality, and help preserve water supply. Further, minimized development in the wildland-urban interface has climate change adaptation benefits of reducing exposure to risk of wildfire.

7. Energy Savings

Encouraging more compact development has been found to increase energy efficiency. Single-family housing requires more energy for space heating and cooling purposes than multi-family housing due to the efficiency afforded by shared walls, ceilings, and floors.³ Energy savings will save residents money on their utility bills, and result in additional GHG emissions reductions in the energy sector.

B. First Round of SCSs

To date, 15 of 18 MPOs have adopted their first SCSs pursuant to SB 375⁴; 14 of which are indicating that they are meeting or exceeding their ARB-adopted GHG emissions reduction targets. ARB staff has completed seven evaluations to verify that the MPO-adopted SCSs adequately demonstrate target achievement. Eight evaluations are currently in process, one SCS has yet to be adopted, and preparation of two SCSs is still underway. SCAG, SANDAG, and SACOG have already begun the process of developing their second SCS pursuant to SB 375. Table 1 below summarizes the status of the first round of draft and adopted SCSs prepared by the MPOs.

³ Ewing, et. Al. 2008. Growing Cooler: The Evidence on Urban Development and Climate Change.

⁴ It is anticipated that Merced County Association of Governments will adopt its RTP/SCS in September 2014.

Table 1: Status of First Round of Sustainable Communities Strategies and Applicable Greenhouse Gas Emissions Reduction Targets

MPO	2020 Target ¹	2035 Target ¹	RTP/SCS Adoption Date	Date ARB Evaluation Completed
San Diego Association of Governments (SANDAG)	-7%	-13%	10/28/2011	11/18/2011
Southern California Association of Governments (SCAG)	-8%	-13%	4/4/2012	6/4/2012
Sacramento Area COG	-7%	-16%	4/19/2012	6/12/2012
Tahoe MPO (CA only)	-7%	-5%	12/12/2012	4/25/2013
Butte CAG	1%	1%	12/31/2012	4/25/2013
Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG)	-7%	-15%	7/18/2013	4/10/2014
Santa Barbara CAG	0%	0%	8/15/2013	11/21/2013
Association of Monterey Bay Area Governments (AMBAG)	0%	-5%	6/11/2104	In process
Stanislaus COG	-5%	-10%	6/18/2014	In process
Kern COG	-5%	-10%	6/19/2014	In process
San Joaquin COG	-5%	-10%	6/26/2104	In process
Fresno COG	-5%	-10%	6/26/2014	In process
Tulare CAG	-5%	-10%	6/30/2014	In process
Madera County Transportation Commission (MCTC)	-5%	-10%	7/23/2014	TBD ²
Kings CAG	-5%	-10%	7/30/2014	In process
Merced CAG	-5%	-10%	TBD	TBD ²
Shasta County Regional Transportation Planning Agency (SCRTPA)	0%	0%	Feb. 2015 (tentative)	TBD
San Luis Obispo COG	-8%	-8%	Feb. 2015 (tentative)	TBD

Notes: CAG = County Association of Governments; COG = Council of Governments; GHG = greenhouse gas; MPO = Metropolitan Planning Organization; RTP = Regional Transportation Plan; SCS = Sustainable Communities Strategy; TBD = to be determined.

¹ GHG emissions reduction target measured in percent below (or above) 2005 per-capita GHG emissions.

² ARB will not be reviewing an SCS because these MPOs have not developed an SCS that achieves the targets. These MPOs will need to prepare an Alternative Planning Strategy (APS).

ARB has a specified role in SB 375 implementation. According to the statute, ARB is responsible for setting and revising GHG emissions reduction targets, and conducting technical evaluations to validate an MPO's determination of target achievement. The remaining responsibility for the success of SB 375 rests with other State, regional, and local entities, and with the public. Despite many challenges, public acceptance and interest in developing and implementing SCSs has been very strong.

Factors that ARB staff currently consider when conducting a technical evaluation to validate an MPO's determination of target achievement include:

- Adequacy of the modeling and analysis tools used to develop the SCS;
- Accuracy and reasonableness of the planning assumption inputs to the transportation model, such as population and employment growth projection assumptions;
- Reasonableness of GHG emissions reductions attributed to transportation planning strategies and the timing of reductions;
- Sensitivity test results of the MPO's transportation model to factors that affect VMT.⁵

The MPO's role is to develop the SCS in collaboration with local governments, but the MPO cannot dictate how or whether local government agencies will ultimately implement the plan. However, SB 375 provides incentives to local governments and developers to implement the SCS by offering streamlining provisions under the California Environmental Quality Act (CEQA) for qualifying projects that are consistent with a SCS. Several types of CEQA streamlining are available, from an exemption under very limited circumstances, to reduced requirements for analysis of limited types of impacts. In addition, MPOs have extensively engaged local governments in SCS development helping to gain support for plan implementation.

C. Current Statutory and Regulatory Framework

The law directs ARB to update the targets every eight years consistent with each MPO's timeframe for updating its RTP under federal law, or every four years if warranted based on changes affecting the vehicle fleet or related factors that would reduce GHG emissions in the affected MPO regions. The law specified the targets be indexed to years 2020 and 2035. SCSs prepared by the MPOs will extend to planning horizon years beyond 2035. In addition to achieving the GHG emissions reduction targets

⁵ California Air Resources Board. 2011. Description of Methodology for ARB Staff Review of Greenhouse Gas Reductions from Sustainable Communities Strategies (SCS) Pursuant to SB 375. http://www.arb.ca.gov/cc/sb375/scs_review_methodology.pdf

indexed to 2020 and 2035, ARB staff is interested in whether the SCS will result in continued or sustained GHG emissions reductions beyond 2035.

The State's near-term GHG emissions reduction target is to return statewide GHG emissions to 1990 levels by 2020, and the long-range climate objective is to reduce GHG emissions to 80 percent below 1990 levels by 2050, as reflected in Executive Orders S-3-05 and B-16-2012 (which is specific to the transportation sector). The 2050 objective is consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million carbon dioxide equivalent (CO₂e) and reduce the likelihood of catastrophic climate change.⁶ ARB's *First Update to the AB 32 Climate Change Scoping Plan*, approved in May 2014, recommends the establishment of a mid-term statewide emissions target that aligns with the State's long-term objective of continued emissions reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The establishment of a State mid-term emissions target would inform future SB 375 target setting.

The Updated Scoping Plan acknowledges that achieving California's long-term criteria air pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero-emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.⁷

SB 375 requires ARB to take into account GHG emissions reductions that will be achieved by improved vehicle emissions standards, changes in fuel consumption, and other measures it has approved that will reduce GHG emissions in the affected regions. State-initiated policies and regulations, in addition to SB 375, will also affect transportation emissions from passenger vehicles through land use change (reduce VMT), and vehicle efficiency and emissions technology (reduce tailpipe emissions). As the Scoping Plan states, the combined effects of land use and transportation planning, and vehicle emissions and fuel efficiency (technology) will be necessary to meet GHG

⁶California Air Resources Board. 2014. First Update to the Climate Change Scoping Plan. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

⁷ California Air Resources Board. 2014. First Update to the Climate Change Scoping Plan. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

emissions reduction goals. Existing programs underway in California that will support SB 375 goals are discussed below.

1. Programs Designed to Reduce VMT

- In 2008, AB 1358 (Leto, Chapter 657, Statutes 2008) was signed into law requiring California cities and counties to include complete streets policies as part of their circulation element in their general plans to plan for a balanced, multimodal transportation network that meets the needs of all users of streets (i.e., motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation).
- In 2008, voters approved Proposition 1A, authorizing nearly \$10 billion in State bonds for the United States' first high-speed rail line, which would connect the San Francisco Bay Area with Los Angeles. Investment throughout California in projects that modernize the passenger rail system and link seamlessly to local public transit systems will continue to build public transit ridership and shift travelers from single-occupancy vehicles to public transport.
- AB 1532 (Pérez, Chapter 807, Statutes 2012) requires funds in the GHG Reduction Fund (GGRF) to be used for specified purposes consistent with AB 32. In the State budget for Fiscal Year (FY) 2014-15, the legislature appropriated funds from the GGRF for use by the Strategic Growth Council (SGC) and California State Transportation Agency for investment in housing and transit projects that reduce GHG emissions, including projects that are consistent with SCSs.

2. Programs and Regulations to Reduce Vehicle Emissions

- The 2002 regulations resulting from AB 1493 (Pavley, Chapter 200, Statutes of 2002) formed the foundation for the federal GHG and fuel-economy programs for light-duty vehicles for the 2012–2016 model years.
- The ACC program is a set of regulations that will reduce GHG emissions from new light-duty vehicles by about 4.5 percent per year from 2017–2025, such that by 2025 a new vehicle will emit about half the GHG compared to today's fleet mix. In addition, the Zero-Emission Vehicle (ZEV) Regulation, a component of the ACC program, requires about 15 percent of new cars sold in California in 2025 to be a plug-in hybrid, battery electric, or fuel cell vehicle.

- The Low Carbon Fuel Standard (LCFS), adopted in 2009, requires the carbon intensity of transportation fuels to be reduced by at least ten percent in 2020.⁸

3. Programs and Regulations to Reduce Criteria Air Pollutants

In addition, existing measures implemented by ARB and local air quality management agencies to meet health-based air quality standards frequently provide concurrent GHG emissions reduction benefits. Such measures have a long track record of reducing ozone and particulate pollution, and include incentive-based programs to retire old engines and vehicles (i.e., the Carl Moyer Memorial Air Quality Standards Attainment Program), AB 118 Air Quality Improvement Program, rebates for light-duty clean cars, and vouchers for hybrid and zero-emission heavy-duty trucks. These types of measures will continue well into the future and will provide additional transportation GHG emissions reduction benefits.

IV. Considerations for the Target Update Process

ARB staff will evaluate a range of important factors while developing an appropriate methodology to set the next round of targets. Several of the factors that are under consideration are discussed below, and will be presented to the Board in October. This section is organized by policy and technical considerations.

A. Policy Considerations

Key policy issues for the Board's consideration during the target update process include:

- Whether to change the nature or magnitude of the emissions reduction targets assigned to each MPO;
- When any new targets should apply;
- The potential benefits of allowing MPOs to account for emissions reductions due to local or regional actions that support technological advances in the vehicle fleet;
- How to maximize engagement between MPOs and local governments as critical partners in implementation of SB 375; and
- How re-setting the GHG emissions reduction targets can help improve public health and provide other benefits through SCS development and implementation.

⁸ California Air Resources Board. 2014. First Update to the Climate Change Scoping Plan. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

1. Nature or Magnitude of Targets

SB 375 provides that the GHG emissions reduction targets may be expressed in gross tons, tons per capita, tons per household, or in any other metric deemed appropriate by ARB. The existing Board-adopted targets are expressed in percent reduction in per-capita GHG emissions relative to 2005. The Board considered other types of metrics during the initial target setting process, which included: VMT per-capita; an absolute GHG emissions limit (expressed in tons); a single, uniform target applicable across all MPO regions; and a metric indexed to a different base year other than 2005. The Board selected the currently-adopted metric because it is simple, easily understood by the public, can be developed with currently available data, and is equitable to both fast and slow growth regions. In addition, the 2005 base year allows ARB and MPOs to recognize early actions taken to reduce GHG emissions, compare against a “pre-climate program” snapshot, and measure progress from a consistent baseline.

Some stakeholders have raised the question about whether the nature of the target metric should be changed. A clear advantage of retaining the current metric is maintaining the ability to easily compare GHG reduction performance of subsequent SCSs over time. The current metric is in units of GHG per-capita, which is termed an “efficiency metric” because it represents the GHG emissions from passenger vehicles on a per-population basis for a particular region. Advantages of efficiency metrics include recognition that population and economic growth are implicit, and they allow measurement of the rate of GHG emissions per person, in response to policy change over time, of the planning area as a whole. This type of metric gives information about how one region compares to another when normalized by population, impartial to the region’s size.

ARB could consider replacing the target metric with VMT per-capita, which gives more direct information about the influence of land use and transportation strategies on vehicle travel. On the other hand, VMT per-capita does not give information about the combined effect of vehicle fleet and technology changes along with land use and transportation infrastructure changes.

The question has been raised of whether ARB would consider a single, uniform target rather than MPO-specific targets. A uniform target could be applied to the MPOs either in aggregate (which allows some MPOs to under-perform while other MPOs over-achieve) or across the board (which holds all MPOs to exactly the same standard).

The uniform target could be viewed as a “level playing field”; whereby all MPOs are held to the same standard. On the other hand, a uniform target does not necessarily represent a level playing field because some MPOs have greater opportunity for reductions than others (e.g., access to more resources, larger population growth, potential to affect land use change over time). The uniform target approach could

reduce administrative efforts during target development, but could diminish the technical basis for the GHG reductions achieved and/or result in the target being easily achieved by some MPOs. If the uniform target is too easily met, this could discourage land use and transportation planning that would result in other community co-benefits.

Another aspect of the target metric is the base year 2005, which was originally selected because it served as a reference point for “pre-climate program” conditions in California (i.e., before AB 32 [The California Global Warming Solutions Act of 2006] and SB 375). ARB staff is contemplating whether to recalibrate the targets to a new base year, keep 2005 as the base year, or some other approach. Positive aspects of the 2005 base year are that MPOs have already established their respective 2005 GHG emissions profile during the first round of SCSs, can continue to compare against this “pre-climate program” snapshot, and measure progress from a consistent baseline.

Complications with maintaining a 2005 base year could be introduced when MPOs update their transportation models. For example, if an MPO were to transition from use of an older four-step transportation model to a more contemporary activity-based model (ABM), this would result in two different datasets. The comparison of VMT output and associated per-capita GHG emissions from the two different models may not be “apples-to-apples”. Thus, there are several factors ARB could consider regarding changing the nature of the GHG emissions reductions targets. Several SCS evaluations are still underway, but to date, every MPO’s SCS for which ARB staff has completed an evaluation has achieved its GHG emissions reduction target. Thus, some stakeholders have suggested that the numeric targets be increased, or made more stringent. There is a wide range of options that ARB could consider for changing the stringency of the numeric targets:

- ARB could continue to accept MPO target recommendations based on consultation and scenario planning (as discussed later in this report);
- ARB could increase the targets for MPOs that currently have a target of zero (i.e., no-net-increase in GHG emissions) or a target that allows for an increase in per-capita GHG emissions;
- ARB could increase all the targets by the same or different amounts for each MPOs;
- ARB could increase the targets by the same relative proportion (i.e., percent increase from current target) for all MPOs; or
- make no changes to the magnitude of the targets.

Establishing more stringent targets would theoretically further reduce GHG emissions from more aggressive land use and transportation strategies, but would need to be accompanied by additional resources for SCS implementation, and would also require

MPOs to work with cities and counties to make additional changes to local land use policies. The consultation process with the MPOs would provide insight into whether MPOs can reasonably achieve more aggressive targets than under the first round of SCSs.

2. Timing and Logistics of Target Updates

Key issues for the Board's consideration regarding when any new targets would take effect are discussed separately below.

a. Staggered Target Adoption

One issue for consideration is whether to stagger the timing of target updates to align with the sequential RTP/SCS update cycles of the MPOs, or adopt all the targets at once. The 18 MPOs are all on different cycles for updating their RTPs. For the largest MPOs in the State, the planning process begins three to four years before the next plan has to be adopted. Even for the smaller MPOs, plan development can take two to three years. Many MPOs may want to take advantage of the provision in the law that allows them to recommend their targets to ARB, but they would need to provide those recommendations early enough so that they can be considered by the Board. MPOs need to have enough time, once the targets are revised, to engage in an effective local planning process and develop an SCS that can achieve the targets.

b. Timing of Target Applicability

ARB could also consider whether any newly established targets should apply to the second or third round of SCSs. If the updated targets are all adopted at once (e.g., the end of 2015), the effective date of the new targets would likely be applicable to some of the MPOs (e.g., the 8 MPOs in the San Joaquin Valley) during their second SCS cycle (adopting in 2018) and would apply to others in their third SCS cycle (e.g., SANDAG and SCAG, adopting 2018-2019, respectively). Other MPOs might experience compressed timeframes to determine whether their preferred scenarios comply with the updated targets (e.g., SACOG adopting in 2016). If the Board delays target applicability to the third round of SCSs for all MPOs, the targets would apply to the San Joaquin Valley SCSs scheduled for adoption in 2022.

c. Updating the 2020 Target

Given that 2020 is fast-approaching, ARB could consider whether to update both the 2020 and 2035 targets, or focus on the 2035 target. As discussed in the previous paragraph, if the targets do not go into effect until the third round of SCSs, the 2020 target would become obsolete in some MPO regions. This raises a question about the useful life of the 2020 target. Only updating the 2035 targets, and keeping the currently adopted 2020 targets as-is, would allow ARB staff and MPOs to focus resources on evaluating the longer-term GHG emissions reductions afforded by land use change and transportation infrastructure improvements included in the SCSs. However, introducing

a separate methodology applicable to 2035 and not to 2020 could result in additional technical, logistical, and communication challenges.

3. Impacts of Technology and Fuels

ARB must consider how foreseeable changes to the passenger vehicle fleet might affect the target update process. One important factor includes the extent to which MPOs receive credit in their GHG emissions reduction calculations for vehicle programs that are being implemented at the State level (e.g., ACC, ZEV/plug-in electric vehicles [PEV], LCFS). Questions for consideration by ARB include:

- Should the targets be narrowly focused on reductions from land use and transportation strategies directly tied to the SCS, or should the target setting methodology also account for emissions reductions due to changes in technology?
- How should the target setting methodology anticipate effectiveness of State-initiated programs?

For example, the target setting methodology might specify assumed adoption rates for ZEV/PEVs in the vehicle fleet according to the ACC regulations. However, there may be a supporting role for MPOs to implement or accelerate State-initiated programs (e.g., allocate transportation system funding for PEV charging infrastructure; road pricing and congestion management policies to incentivize ZEV/PEV ownership). ARB should strive to strike an appropriate balance to potentially allow MPOs to receive credit for surplus and additional SCS actions that green the passenger vehicle fleet while continuing to incentivize reduced VMT through ambitious land use and transportation planning strategies.

4. Engaging Regional and Local Governments

A critical policy consideration is the extent to which regional and local governments continue to engage in a positive way and build the momentum for local support of SB 375. To date, MPOs have worked hard to develop SCSs with the participation and support of local governments. Local land use authority rests with local government agencies, so the collaborative approach between the MPOs and local government partners will be an important model to continue in future SCS development.

MPOs currently conduct preliminary scenario development and testing of various scenarios to compare the GHG emissions benefits, using their transportation models and other modeling tools. MPOs make their GHG emissions reduction target recommendations to ARB based on these initial results. ARB could encourage a process whereby MPOs work with their local governments during this initial scenario planning phase of the target setting process. This way, the Board and the public can better understand the potential approaches that a region could take to achieve the GHG

emissions reduction targets, and can provide more effective Board input earlier in the SCS preparation process. However, this additional phase of public dialogue would extend the time required to develop and adopt the targets. Allowing sufficient time for MPOs to properly engage with local governments, ARB, and the public to identify appropriate strategies and their GHG emissions reduction benefits, will also allow the MPOs time to engage in public outreach and dialogue about other equally important community benefits of sustainable planning.

5. Providing Community Benefits

The main objective of SB 375 is to mitigate climate change impacts by reducing GHG emissions from light duty vehicles, through more integrated planning for sustainable communities. Many of the strategies that MPOs pursue in their SCSs to achieve their assigned GHG emissions reduction targets are the same types of strategies that local communities pursue to achieve a wide range of environmental, social, and other benefits. SB 375 provides a framework for communities to reduce infrastructure costs, improve access for everyone, preserve natural resources, and improve public health, along with many other benefits discussed earlier in this report. ARB could consider how revising the GHG emissions reduction targets could incentivize development of SCSs that provide a broad range of community and environmental benefits.

B. Technical Considerations

Key technical issues for the Board's consideration during the target update process include:

- Whether to continue treatment of inter-regional travel using the current methods, or develop another method; and
- How to help MPOs to improve their modeling tools and input data and achieve greater consistency in their input assumptions.

These issues are discussed in greater detail below.

1. Inter-regional Travel

Better tools and data to account for inter-regional travel are needed, and staff has begun a dialogue with modeling experts, not only to understand how inter-regional travel is currently estimated, but also to explore alternative methodologies that could be used in the target update process and in future SCS development.

As discussed previously, the RTAC provided recommendations to ARB on allocation of VMT to MPOs. RTAC recommended that VMT from internal trips be attributed at 100 percent, VMT from trips that originated or terminate within an MPO would be discounted by 50 percent, and VMT from "pass-through" trips that do not originate or terminate in

the MPO would be excluded. This methodology was not necessarily followed by all MPOs. Some MPOs included 100 percent of VMT up to their MPO border.

The current RTAC-recommended method for VMT attribution attempts to allocate VMT as equitably as possible between MPOs given current modeling capabilities. This method also attempts to recognize that an MPO has more ability to influence distance and mode for a local trip than for an inter-regional trip, and has very limited ability to influence a pass-through trip.

In addition, inter-regional VMT varies dramatically between small (single-county) and larger MPOs. For example, an internal trip within the SCAG region may be 200 miles long, and never leave the MPO boundary. However, a much shorter trip from San Joaquin County to Stanislaus County is considered an inter-regional trip. The methodology for inter-regional travel should consider the fact that MPOs are both large and small.

Due to current modeling capabilities, it is difficult for transportation models to characterize full vehicle trip length once the trip leaves the MPO boundary. ARB staff is investigating the issue of inter-regional travel, and has convened a working group of transportation modeling experts. ARB staff seeks to reevaluate treatment of inter-regional travel as it affects the target setting methodology. ARB staff is also investigating the availability of statewide modeling tools to help address this issue in the long run, discussed further in the next section.

2. Modeling Tools and Assumptions

The capabilities of transportation models can vary widely depending on the applicable federal transportation planning requirements and characteristics of the jurisdiction. The main value of models is to identify the direction and magnitude of change to allow decision makers to compare between alternative scenarios.

a. MPO Transportation Models

Transportation models are the primary tools used by MPOs to forecast current and future land use and travel, to develop long-range plans, and to evaluate policies at the State, regional, and corridor levels. Each of California's MPOs maintain and use a transportation model with unique capabilities depending on federal transportation planning requirements and available resources. These models are critical for MPOs to make decisions regarding growth and improvements to their regional transportation systems.

The need to examine new and more complex policies such as mixed use development, transit-oriented development, improvements in traffic operations, and congestion pricing is becoming increasingly important since the passage of SB 375. Historically in

transportation models, it is extremely difficult to quantify the benefits of these strategies in a realistic and detailed manner. MPOs in California are enhancing their models to respond to these new demands to represent integration of land use and transportation systems, including improvements to traditional trip-based models, development of advanced land use models and sketch planning tools, longer-term transition towards ABMs, and integration of land use models within transportation models. These model improvements are carried out in an incremental manner in accordance with a model improvement program that is based on federal transportation planning requirements and funding availability, and can take years to implement. Model enhancements are an ongoing process and range widely in complexity and cost. MPOs have been steadily improving their modeling and forecasting capabilities.

There are different types of transportation models. The traditional “four-step” model attempts to estimate: trip generation, trip distribution, mode choice, and trip assignment to the roadway network. These models are used by MPOs for a number of purposes, including compliance with State and federal transportation planning and air quality requirements, including CEQA analysis and SCS development and evaluation.

The more sophisticated ABM is a type of transportation model that is based on the types of activities people undertake throughout the day. ABMs are more complicated and costly for MPOs to set up and run, but are more detailed because they represent travel in a more realistic way than four-step models. Some MPOs are in the process of transitioning from four-step models to ABMs. Though ABMs provide more consistent and detailed outputs than four-step models, the accuracy of the model improves to limited extent.

Understanding the land use pattern in a region is fundamental to running the transportation model. In California, common practice is that MPOs reflect the land use information from general plans developed by cities and counties. Several MPOs use sketch planning tools to evaluate various land use scenarios and input these results into their transportation models. However, recently some MPOs have used land use models to forecast future land use changes. A few MPOs also use post-processors to quantify empirical benefits from various land use and transportation strategies in their SCSs that are not able to be reflected in transportation models. Over the long term, some MPOs are beginning to integrate advanced land use models within their models, improving the interactions between their transportation models and land use models.

Improvement to transportation models requires a commitment of substantial staffing and funding resources, and MPOs therefore approach these improvements incrementally. Proposition (Prop.) 84, passed in 2006, authorized the legislature to appropriate planning and urban greening grant funds. SB 732 (Steinberg, Chapter 13, Statutes of 2008) established the SGC. One of SGC’s primary objectives is to manage and award

the Prop. 84 grant funding. SGC allocated \$12 million of Prop. 84 funding to MPOs for transportation model improvements in 2009.

b. Statewide Transportation Model

At the statewide level, the California Department of Transportation (Caltrans) is developing a California Statewide Travel Demand Model (CSTDm) based on the ABM modeling structure. This model simulates individual person and vehicle movement in California. This model uses the latest California Household Travel Survey and 2010 census data. Caltrans is planning to use this model to evaluate various transportation strategies as part of their California Transportation Plan 2040. MPOs are hopeful that they will be able to use the output from this model to better-estimate inter-regional travel and long distance trips.

c. Emission Factor Model

ARB's Mobile Source Emission Factor Model (EMFAC) is the source of passenger vehicle emissions rates used for conversion of VMT to GHG. EMFAC is a California-specific computer model that calculates weekday emissions of air pollutants from all on-road motor vehicles including passenger cars, trucks, and buses for each geographic region of the State. EMFAC uses vehicle activity provided by regional transportation planning agencies, and emissions rates developed through vehicle testing. ARB updates EMFAC every few years. Updates include vehicle activity, vehicle populations, speed distribution, fleet turnover data, and adopted regulations that will affect emissions rates.

During SCS preparation, MPOs estimate passenger vehicle VMT and speed profiles for the region and apply them to the EMFAC model to estimate per capita carbon dioxide (CO₂) emissions. MPOs then divided the estimated CO₂ emissions for passenger vehicles by the residential population to obtain CO₂ emissions per capita.

EMFAC 2007 was used to establish the first round of SB 375 targets. Future versions of EMFAC will continue to update emissions rates based on emissions testing of vehicles. The goal is to hold each MPO to the same level of stringency for meeting their SB 375 targets, even when emissions rates in the model change. ARB staff could develop methods to address this issue during development of the target setting methodology.

d. Model Assumptions

Assumptions are a necessary part of running a transportation model. The target setting process could recognize the VMT and GHG reduction benefits from changes in market trends and behavioral change, such as attitudes about where people choose to live and how they choose to get around. Evidence about changes in demographics, employment, and educational trends that support sustainable communities should be

considered and built upon in the SCS process. However, it is important that ARB advise MPOs on how to consistently account for these types of assumptions in their models.

i. Auto Operating Costs

Auto operating cost is a critical input to a transportation model and affects modeled travel behavior and VMT estimation. Each MPO has its own methods for determining auto operating cost. Some MPOs base auto operating cost solely on fuel price, others include maintenance and insurance as part of auto operating cost. Fleet fuel economy also needs to be factored into the calculation of auto operating cost, because as fleet fuel economy improves, auto operating cost declines. MPOs have used varied assumptions for fuel price and fleet fuel economy. The four largest MPOs agreed to use a common set of fuel price projections during their first round of SCS development. However, not all of the other MPOs have consistently used these numbers. ARB staff is working to understand the sensitivity of transportation models to changes in auto operating cost and the contribution of increasing auto operating cost on VMT reductions. ARB staff could provide additional direction on consistent treatment of the factors used to estimate the auto operating cost.

ii. Economic Conditions and Assumptions

Economic assumptions such as unemployment rate, overall health of the economy, fuel price, and cost of vehicle operation (discussed above) are input parameters into transportation models that affect VMT output. However, these parameters are outside of the control of an MPO's RTP process. ARB could provide additional direction to MPOs on consistent treatment of external economic factors and model assumptions that are inputs into transportation models used to develop the SCSs. ARB staff could consider methods to better-differentiate between VMT and GHG reductions from land use and transportation planning strategies and the contribution from external, economic factors.

It may be very difficult to distinguish GHG emissions reductions from a certain RTP/SCS project or policy from local government actions, statewide actions, and economic and behavioral trends. ARB should carefully balance the technical basis needed for estimating GHG emissions reductions of SCS strategies, while not discouraging or disincentivizing MPOs by precluding GHG emissions reduction credit in their SCS. ARB could consider how this dilemma might be addressed in the target setting process. In other words, ARB could evaluate how to assign GHG emissions reduction credit when MPOs, local governments, State law, and external factors work together in support of GHG emissions reductions.

V. Next Steps and Future Implementation

The target update process will follow this general schedule and framework:

- October 2014: Board direction to staff on target setting.
- November 2014: staff develops a workplan based on Board direction.
- Early 2015 through mid-2015: Consultation between ARB staff and MPOs. MPOs provide preliminary target recommendations to ARB.
- Mid-2015 through late 2015: Board action to establish new targets.

A. Information Exchange with MPOs

SB 375 specifies that, prior to setting the targets for a region, ARB shall exchange technical information with the MPO and the affected air district. The statute gives MPOs the opportunity to recommend a target for the region. During the initial target setting process, many of the MPOs provided ARB with recommendations for their respective targets. The recommendations were based on scenario planning and what the MPOs thought they could reasonably achieve.

The collaboration process between the MPOs, ARB, and local jurisdictions is critical for the success of the SCS because MPOs do not have land use authority. Consensus between MPOs and local jurisdictions on the preferred land use and transportation strategy to achieve the GHG emissions reduction target is necessary, because the local governments ultimately play a major role in implementing the SCS. This consultation and collaborative approach will be important to continue. Successful collaboration between MPOs and local governments to establish development policies to help implement the SCS will promote continued and sustained GHG emissions reductions beyond 2035. ARB staff would like to continue to receive technical information on what types of sustainability strategies are considered in the scenario development. It would be beneficial to receive this information concurrent with SCS preparation rather than after the SCS has been largely completed.

B. Funding for Implementation

Once an SCS is adopted, ARB staff encourages local governments and MPOs to implement the policies so that the GHG emissions reductions are realized. ARB staff recognize that resources are limited for the necessary planning and project development associated with implementing an SCS.

The FY 2014/15 State budget dedicates \$130 million in cap-and-trade revenues for implementation of sustainable communities and affordable housing projects that will result in GHG emissions reductions. These projects may include capital facilities projects normally found in SCSs. The FY 2014/15 budget also allocates \$25 million for transit and intercity rail, \$25 million to low carbon transit, and \$200 million to low carbon transportation. A certain portion of the funds must be directed to benefit disadvantaged communities, which will incentivize projects that also benefit smaller communities in

addition to the largest metropolitan areas. Each of these funding strategies will support achievement of the goals of SB 375 through sustainable planning and technology.

C. Environmental Analysis

In 2010, ARB, as the lead agency for the target setting process, prepared a CEQA document entitled the *CEQA Functionally Equivalent Document (2010 FED)*⁹. The 2010 FED provided a programmatic level of analysis of the potential environmental impacts associated with the establishment of the regional targets, based on expected actions by the MPOs to develop and implement plans that could achieve the regional targets. The 2010 FED was provided to the public for review and comment, and ARB responded in writing to all public comments before final action on adoption of the regional targets¹⁰. The 2010 FED was certified in 2011, along with findings and a statement of overriding considerations and approval of the written responses to comments.

As part of the target update process, ARB staff will evaluate whether a supplemental environmental analysis to the 2010 FED is required due to the involvement of new significant environmental impacts or a substantial increase in severity of previously identified significant impacts¹¹. If a supplement to the 2010 FED is required, it will be circulated for public review and comment, and written responses will be prepared for any comments on the supplement, prior to Board action on any proposed updated targets.

VI. Conclusion

The Scoping Plan indicates that GHG emissions reductions are needed from many possible paths in the transportation sector, including changes to land use that reduce VMT and changes in technology that reduce emissions from vehicles. SB 375 is identified in the Scoping Plan as one of the mechanisms for achieving the State's GHG emissions reduction goals.

SB 375 charges ARB with setting and updating the GHG emissions reduction targets applicable to the State's 18 MPOs. This preliminary draft staff report presents several factors that ARB could consider when updating the SB 375 targets and target setting methodology, and is intended to solicit input from stakeholders and MPOs prior to the

⁹ Prepared under ARB's CEQA certified regulatory program (PRC 21080.5; 14 CCR 15251[d]). *CEQA Functionally Equivalent Document*. http://arb.ca.gov/cc/sb375/fed_sb375_080910.pdf

¹⁰ Responses to public comments received on the 2010 FED were published in document entitled *ARB Responses to Public Comments on the Functional Equivalent Document (FED) for the Proposed SB 375 Regional Targets*. <http://www.arb.ca.gov/cc/sb375/response%20to%20fed%20comments.pdf>.

¹¹ 14 CCR 15162.

October 2014 Board meeting on this topic. ARB staff will consider public input received at the September 2014 public workshops, and will revise and finalize this report based on input received. A revised staff report will be released to the public prior to the October 2014 Board meeting.

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