RECOMMENDATIONS OF THE REGIONAL TARGETS ADVISORY COMMITTEE (RTAC) PURSUANT TO SENATE BILL 375

A Report to the California Air Resources Board

Regional Targets Advisory Committee Members

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The statements and recommendations in this report are those of the Committee and not necessarily those of the California Air Resources Board.

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TABLE OF CONTENTS

I. Introduction 1

A. ARB Climate Change Scoping Plan 1
B. Senate Bill 375 Requirements for Target Setting 1
C. Regional Targets Advisory Committee Role 3
D. RTAC Guiding Principles 3
E. Key Questions Identified by RTAC 3

II. Regional Targets Advisory Committee Recommendations on Target Setting Process and Method 6

A. Target Setting Process 9
1. MPO/ARB Interaction 9
2. Expert Consultation 13
3. ARB Stakeholder Process 13
4. State Agency Interaction 14
B. Target Setting Methods and Tools 15
1. Use of Empirical Studies 15
2. Use of Modeling 16
3. Identification of Key Underlying Assumptions 20
4. Best Management Practices 21
5. Flexibility in Achieving Targets 23
6. Base Year 24
7. Target Metric 24
8. 2020 and 2035 Targets 24
9. Accounting for Statewide Fuel and Vehicle Technology 25
10. Statewide Assumptions 25
11. Interregional Travel 26
12. Achievability and Ambitiousness of Targets 26

III. RTAC Recommendations on Implementation 28

A. Housing and Social Equity 28
B. Local Government Challenges 30
C. Incentives for Exceeding Target 32
D. State Actions to Support Implementation 33
E. Federal Transportation Funding and Supporting Policies 35
F. Public Education and Outreach 38
G. Flexibility in Designing Strategies 40
H. Co-benefits of Sustainable Communities Strategies 42
I. Performance Monitoring 44
J. Model Enhancements 46

IV. Follow-Up RTAC Meeting 47

Appendices

Appendix A: MPO Self-Assessment of Current Model Capacity and Data Collection Programs 48

I. Introduction

A. ARB Climate Change Scoping Plan

The Climate Change Scoping Plan, adopted December 2008, is the overarching framework for meeting the Global Warming Solutions Act of 2006's (AB 32) greenhouse gas emissions reduction goal of returning to 1990 emissions levels by 2020. The comprehensive Scoping Plan proposes actions for all sectors to reduce emissions, including a section specifically for regional passenger vehicle-related emissions. This section points specifically to SB 375 (Steinberg, Chapter 728, Statutes of 2008) as the process for reducing greenhouse gas emissions through more sustainable land use and transportation planning.

In adopting the Scoping Plan Resolution, the Board stated its intent that the SB 375 greenhouse gas emission reduction targets would be the most ambitious achievable. The estimated reductions included in the Scoping Plan are expected to be replaced by the outcome of the Board's decision on SB 375 targets.

Further, the Board resolved that, as input to the SB 375 target setting process, the Regional Targets Advisory Committee (RTAC or the Committee) should recommend a method that would evaluate the full potential for reducing greenhouse gas emissions in each major region of the state.

B. Senate Bill 375 Requirements for Target Setting

SB 375 is landmark legislation that aligns regional land use, transportation, housing and greenhouse gas reduction planning efforts. It requires ARB to set greenhouse gas emission reduction targets for passenger vehicles and light trucks for 2020 and 2035. Cal. Govt. Code § 65080(b)(2)(A). The targets are for the 18 Metropolitan Planning Organizations (MPOs) in California. MPOs are responsible for preparing Sustainable Community Strategies (SCS) and, if needed, Alternative Planning Strategies (APS), that will include the region's strategy for meeting the established targets. Cal. Govt. Code § 65080(b)(2)(B). An APS is an alternative strategy that must show how the region would, if implemented, meet the target if the SCS does not. Cal. Govt. Code § 65080(b)(2)(H).

In the Southern California Association of Governments (SCAG) region, SB 375 provides the option for the coordinated development of subregional plans by the subregional councils of governments and the county transportation commissions to meet SB 375 requirements. Cal. Govt. Code § 65080 (b)(2)(C).

Prior to setting targets for a region, ARB is required to exchange technical information with each MPO and the affected air districts. Cal. Govt. Code § 65080(b)(2)(A)(ii). In establishing the targets, ARB must take into account greenhouse gas emission reductions to be achieved by improved vehicle emission standards, changes in the

carbon-intensity of fuels, and other measures it has approved that will reduce greenhouse gas emissions in affected regions. Cal. Govt. Code § 65080(b)(2)(A)(iii). As these factors may change, ARB may revise the targets every four years, and at a minimum, must update them every eight years. Cal. Govt. Code § 65080(b)(2)(A)(iv).

The targets may be expressed in gross tons, tons per capita, tons per household, or in any other metric deemed appropriate by ARB. Additionally, each MPO may recommend a target for its region. Cal. Govt. Code § 65080(b)(2)(A)(v).

Once regional strategies that meet the targets are in place and approved by ARB (Cal. Govt. Code § 65080(b)(2)(I)(ii)), SB 375 includes California Environmental Quality Act (CEQA) incentives, which allow for streamlined environmental review of projects that meet specific criteria outlined in the bill. Cal. Pub. Res. Code §§ 21155.1, 221159.28.

Once the targets are set, SB 375 requires MPOs to integrate their region's greenhouse gas emission reduction target for automobiles and light-duty trucks into their next Regional Transportation Plan (RTP) development process. Under federal and state law, each of the 18 California MPOs are required to develop an RTP. SB 375 adds a new state requirement to include an SCS, which includes an underlying land use plan for the RTP tied to the regional transportation system and resulting greenhouse gas reduction. The SCS is a fourth element added to three existing elements (policy, financial, and action) that constitute a region's long range RTP.

RTPs are approved by an MPO's board, along with the certification of the RTP Environmental Impact Report (EIR) and a transportation conformity determination that ensures the region is on track to meet federal air quality requirements. The documents are then transmitted to the Federal Highway Administration, Federal Transit Administration, and U.S. Environmental Protection Agency for joint consideration. The RTP serves as one of the key documents used by the federal government to identify and fund transportation projects, programs, and services in a region. Since the SCS is part of the RTP, the resulting document must comply with all applicable state and federal requirements, including financial constraint and the use of latest planning assumptions.

SB 375 requires an additional document, the APS, to be created by an MPO that has determined it will not reach its region's target through its SCS. The APS is a separate document and is not required to meet federal and state requirements for RTPs, however, the APS may be adopted concurrently with the RTP. If an APS is necessary, it is meant to "bridge the gap" between the greenhouse gas emission reductions an SCS can achieve and a region's target, set by ARB.

Finally, SB 375 sets out a very limited role for ARB in determining how the targets will be achieved. Specifically, after assigning targets, ARB's role is to assure the accuracy of the methodology selected by each MPO and then to determine whether the SCS, or the alternative, the APS, would achieve the target if implemented. Thus, the policy choices relating to how the MPO will achieve the target are left to the region.

C. Regional Targets Advisory Committee Role

SB 375 required ARB to create the RTAC to recommend factors to be considered and methodologies to be used by ARB when setting targets. ARB appointed members to the Committee in January 2009. The Committee met monthly from February through September, including several additional semi-monthly meetings for a total of 14 meetings. It is comprised of a diverse group of 21 individuals representing affected stakeholders including MPOs; air districts; local governments; transportation agencies; homebuilders; environmental, planning, affordable housing and environmental justice organizations and members of the public. Appointed members are listed in Appendix A.

The Committee's specific charge is to prepare a report for ARB's consideration that recommends factors to be considered and methodologies to be used for regional target setting. Cal. Govt. Code § 65080(b)(2)(A)(i). In doing so, the Committee may consider relevant issues, including data needs, modeling techniques, growth forecasts, impacts of regional jobs-housing balance on interregional travel and greenhouse gas emissions, economic and demographic trends, the magnitude of greenhouse gas reduction benefits from a variety of land use and transportation strategies, and appropriate methods to describe regional targets and to monitor performance in attaining those targets.

All information and correspondence associated with the Committee is publicly available on ARB's website at http://www.arb.ca.gov/cc/sb375/sb375.htm.

D. RTAC Guiding Principles

To guide its efforts, the Committee agreed to the following principles:

- Minimize administrative burden in program implementation or tracking;
- Encourage regional and sub-regional cooperation rather than competition;
- Avoid conflicting statutory requirements, if any;
- Maximize integrated system-approach allowable under the law;
- Maximize co-benefits of air quality, mobility, and economic growth;
- Engage with the public through a transparent and clear public process;
- Use metrics that measure cost-effectiveness;
- Maximize social equity;
- Emphasize the need for a secure source of transit and redevelopment funding; and,
- Provide incentives for local governments and regional agencies to maximize greenhouse gas reductions.

E. Key Questions Identified by RTAC

In addition to its guiding principles, the Committee also developed a list of questions relevant to the target setting process. Some questions are addressed specifically in these recommendations. Other questions were formed broadly and the Committee's discussion on the questions helped establish the basis for the recommendations.

The Committee came to consensus on the following preamble and key questions that are relevant to the target setting process:

California's strategy for reducing greenhouse gas emissions from passenger cars includes three elements: vehicle technologies, low-carbon fuel technologies, and reduced vehicle use through changed land use patterns and improved transportation. In the target setting process spelled out in SB 375, ARB is to consider greenhouse gas emission reduction strategies underway to implement AB 32. Since ARB adopts the state's vehicle and fuel technologies regulations, it currently has the tools and methods for considering these strategies in the target setting process. Therefore, ARB needs the Committee recommendations on the factors and methodologies for setting targets that relate directly to passenger vehicle use. The following ten questions formed a suggested framework the Committee used to focus its efforts on vehicle-use related factors and methodologies.

Question #1: What are the key factors within the control of local governments and MPOs that influence greenhouse gas emissions from automobiles and light trucks use? How do land use, the transportation system, and pricing specifically affect vehicle miles traveled (VMT) and greenhouse gas emissions? What is the magnitude of these factors under a variety of conditions? (See Expert Consultation, page 13; Use of Empirical Studies, page 15; Best Management Practices, page 21; Performance Monitoring, page 44)

Question #2: How do economic and other factors affect the magnitude of change possible in the land use and transportation sectors? This includes such factors as the price of gas and other variables that affect the price of travel, consumer preferences, especially for housing and the cost of housing, the economics of different development patterns, environmental considerations, social equity issues, funding levels available for different types of transportation investments, and local government tax structure and other market forces and fiscal considerations. (See Statewide Assumptions, page 25 and Housing and Social Equity, page 28)

Question #3: What are acceptable**,** reliable, and cost-effective data quality and modeling tool standards for implementing various methodologies to process the factors into targets? How do current models compare to these standards? Are the various models synchronized with their air quality counterparts? What improvements are needed (e.g. data gathering efforts, model calibration), what assistance can the state provide in expediting these improvements, and which can be made in time to meet the first round of targets? If not, what are the alternatives? What is the cost to make those improvements? (See Expert Consultation, page 13; Use of Empirical Studies, page 15; Use of Modeling, page 16; Best Management Practices, page 21; and Model Enhancements, page 46)

Question #4: What support and authority can the state provide to local governments and MPOs in the form of implementation tools, (i.e. policies or programs/grants in addition to the modeling issues addressed in #3 above) and how do these tools affect VMT and greenhouse gas emissions? (See State Actions to Support Implementation, page 33)

Question #5: How should automobile and light-duty truck trips that cross regional and sub-regional boundaries be treated? What factors need to be considered for trips crossing state and international boundaries? (See Interregional Travel, page 26)

Question #6: Should goods movement trips be considered relative to their impact on passenger vehicle emissions? (See MPO/ARB Interaction, page 9)

Question #7: What metric(s) should be used to express regional targets? What are the pros and cons of the various choices? For example, should the metric(s) be per capita or total greenhouse gas emissions for a region? Should the metric(s) be relative to current conditions or a future year baseline? How should the metric(s) account for differences between regions, e.g. growth rates, incomes, current jobs-housing balance? What monitoring programs are needed to assess the permanence of emission reductions and usefulness of the metric(s) over time? (See Target Metric, page 24; Performance Monitoring, page 44)

Question #8: How should the relationship between land use/transportation measures and external factors, such as low-carbon fuel and vehicle efficiency regulations be treated? How should SB 375 efforts relate and link with existing air quality and transportation planning processes? (See State Agency Interaction, page 14; and Accounting for Statewide Fuel and Vehicle Technology, page 25)

Question #9: How can the various methods be evaluated to see if they support the goal of setting the most ambitious achievable targets? (See MPO/ARB Interaction, page 9; Expert Consultation, page 13; and ARB Stakeholder Process, page 13)

Question #10: How can SB 375 implementation inform and influence existing and future federal laws and policies, when appropriate? (See Federal Transportation Funding and Supporting Policies, page 35)

II. Regional Targets Advisory Committee Recommendations on Target Setting Process and Method

Overview

This section of the report describes the Committee's recommendations for the target setting process as well as the tools and methods that should be used in that process. This overview highlights several points that were prominent in the Committee's discussions. These points are also discussed in more detail later in the report.

The Committee recommends that regional targets be expressed as a percent per-capita greenhouse gas emission reduction from a 2005 base year. ARB would use an interactive process with the MPOs to set a single statewide uniform target that could be adjusted up or down to respond to regional differences. Any adjustment would be subject to a "reasonably tough test". This process must ensure that targets are the most ambitious achievable for that region. The process will also involve expert consultation and interaction with stakeholders, the public and other state agencies.

The Committee also spent a great deal of time and energy discussing the role of travel demand models and Best Management Practices (BMPs) in the target setting process. At the conclusion of its discussions, the Committee agreed to the following:

1) All MPOs employ travel modeling, and the results of the modeling with respect to greenhouse gas emissions will be made publicly available.

2) The Committee supports the use of a list of accepted best management practices, or BMPs for:
   - One of several tools to be used in target setting;
   - Greenhouse gas reduction strategy development;
   - Target compliance demonstration by small MPOs in the first round and as an action plan to supplement model compliance by all MPOs;
   - ARB to use as an accuracy check on each MPO's submittal as part of its strategy approval process;
   - A user-friendly tool to facilitate public review of the greenhouse gas reduction strategy for all MPOs.

3) The Committee discussed the option of recommending that all MPOs have the option of using the BMP list as the sole method of demonstrating compliance, and could not come to resolution. Prior to ARB deciding on this option, the Committee recommends ARB consider all pros and cons related to this decision as discussed at the July 22, August 5 and 18, and September 1, 2009 Committee meetings.

Development of Tools

In putting forward this recommendation, the Committee recognizes that due to the statutory timeframes for target setting, the most immediate need is the development of a list of BMPs. This BMP list should include data from empirical studies, blueprints, and modeling from MPOs that identifies the magnitude of greenhouse gas reductions that may be achieved through implementation of the policies and practices. The list of BMPs would not be an exclusive list. Indeed, regions would be free to incorporate other practices into their SCS or APS to the extent that they can demonstrate that travel model results, empirical evidence, and actual monitoring data exist to support the magnitude of greenhouse gas reductions assumed to be achieved through implementation of those BMPs.

Nevertheless, a pre-developed list of BMPs will be a useful reference point for MPOs. We recommend ARB initiate, with expert consultation, the development of this BMP list as soon as possible, with the intent to finalize it in the next 4-6 months. The BMP list would immediately assist ARB in target setting, help local and regional governments in developing the region's greenhouse gas reduction strategy, and provide regions with a user-friendly tool to facilitate public interaction. In addition, the BMP list will assist ARB in evaluating submitted MPO strategies, and in the case of small MPOs, may be the only tool used to demonstrate compliance with the targets.

The Committee's recommendation for the development of a BMP list is tied closely with its recommendation that ARB also undertake an effort, with expert consultation, to convert the BMP list into an analytical BMP spreadsheet tool that could provide an assessment of what greenhouse gas reductions may be possible by implementing some or all of the policies and practices identified in the BMP list. The tool should have the capacity to account for significant regional differences and the synergistic interaction of multiple BMPs. This functionality would enhance ARB's target setting process and would assist MPOs in model and scenario development. The Committee believes strongly in the utility of such a tool to assist in both near-term target setting and longer term local planning and implementation.

The Committee recognizes that travel demand and land use models, including off-model post-processors, are an essential, inextricable piece of the regional transportation planning process. Accordingly, any simple analytical tool that is created should be done so that it is easily compatible with existing travel demand models employed by the 18 MPOs.

The use of travel demand models in conjunction with land use models provides the ability to estimate the aggregate impacts of implementing multiple land use and transportation polices and practices. Since the Committee assumes that these modeling systems will be used by all the MPOs throughout SB 375 implementation, regional and statewide model transparency, consistency, and plans for improvement are a critical component of the Committee recommendations. This report also includes recommendations for improving the functionality and consistency of these models for

the purposes of predicting and measuring the greenhouse gas reductions attributable to actions pursuant to SB 375.

To support both the development of the BMP tools, and to improve the accuracy of regional travel demand and land use models, the Committee encourages the funding of model development and more empirical studies, and recommends that any new information be appropriately incorporated into the SB 375 implementation process as it becomes available.

The work of the Committee over the past eight months has, to some degree, already initiated the development of pieces of each of these tools. The Committee requested information from MPOs on their modeling capabilities and planning scenarios, recommended and described the role and function of empirical data, and discussed lists of policies and practices that may serve as the foundation of a BMP list.

Target Setting

While the Committee recommends that ARB use all of the tools and information at its disposal in developing and setting the regional targets, the sophistication and capabilities of each MPO to use these tools differ widely throughout the state. In light of this, we recommend that ARB consider this regional variation in the target setting process. For instance, the larger regions have better capability of using advanced modeling tools with more sophisticated techniques to estimate the impacts of land use and transportation strategies. ARB should expect that the target setting process would rely heavily on modeled outputs and scenarios that can also be used in combination with BMPs in these regions. Conversely, in smaller regions with less sophisticated modeling, ARB may need to rely more heavily on the BMP list or BMP spreadsheet tool to estimate the impacts of land use and transportation strategies.

Meeting the Target

The Committee also understands and expects that with SB 375 implementation the science and data underlying land use and transportation planning will evolve and improve rapidly. As a result, we recognize that the tools and information ARB will have for setting targets by September 2010 may be different, depending on each region's schedule, from the tools and information that MPOs will have when they demonstrate how they will meet their targets. It is crucial that ARB, MPOs, and other stakeholders address this reality and design a process that can apply new tools and data to the regular RTP update process as soon as they come available, and can reconcile the new tools and data with those used to set the targets. It is similarly crucial that MPOs demonstrate the ability to reconcile the outputs of the various existing methodologies available to demonstrate attainment of their targets.

The Committee is recommending a strong role for the BMP list and BMP spreadsheet tool. Foremost is the value these bring as communication tools for the public and local governments. The BMP list and BMP spreadsheet tool provide actions that can be

taken by local governments that include some indication of the magnitude of greenhouse gas emission reductions that can be expected. This makes articulation and implementation of the greenhouse gas reduction strategies easily identifiable and understandable to the public and elected officials.

For all MPOs, the BMP list can help form an action plan to supplement model compliance. And, the Committee recommends an option to allow small MPO regions the ability to use only the BMP tools to demonstrate compliance with the SB 375 targets set by ARB. The Committee discussed the option of recommending that all MPOs have the option of using the BMP list as the sole method of demonstrating compliance, and could not come to resolution. Prior to ARB deciding on this option, the Committee recommends ARB consider all pros and cons related to this decision as discussed at the July 22, August 5 and 18, and September 1, 2009, Committee meetings.

Finally, as ARB staff proceeds into the next phase of SB 375 implementation, the Committee recommends that ARB continue to maintain its high degree of transparency throughout the target setting process and beyond. As described in more detail below, ARB interactions with all stakeholders are key to the target setting process and to the success of the methods recommended by this Committee.

A. Target Setting Process

1. MPO/ARB Interaction

SB 375 encourages a high level of ARB interaction with key stakeholders throughout the target setting process as evidenced by the representation on the Committee as well as specific direction for ARB to exchange technical data with MPOs and the affected air districts. The success of the target setting process, therefore, is described best through the collaborations that must continue to occur. Interaction with local governments, the public, air districts, other state agencies, and transportation and land use experts is important as discussed elsewhere in this report. The interactions between ARB and the MPOs are particularly critical given that the planning requirements of SB 375 fall to the MPOs to carry out.

The proposed process for setting greenhouse gas emission targets under SB 375 should center on collaboration among the MPOs and ARB, with support from Caltrans and the California Transportation Commission regarding modeling and regional transportation plan guidance. Technical input may also be solicited from other agencies, such as the Federal Highway Administration, Federal Transit Administration, and U.S. Environmental Protection Agency.

The target setting process will also require direct participation and buy-in from local jurisdictions, county transportation commissions (particularly for the SCAG region), affected air districts, and other major stakeholders. The MPO/ARB interactions and the emission reduction target setting process will be greatly enhanced by what the Committee has described as a “bottom-up” process. Transparency is also key to this

process. The Committee recommends that all data, analyses and documents be available for public review at every step in the process.

To ensure effective and efficient communication between ARB and the MPOs between now and September 2010, the Committee recommends the following process as a way to set the level of expectation about how that interaction could occur.

Step 1 MPOs prepare an analysis of their adopted fiscally constrained RTP, which includes its assessment of the location and intensity of future land use that is reasonably expected to occur. The analysis would include estimates of respective regional 2005 base year, 2020 and 2035 greenhouse gas emission levels (e.g., for defined "No Project" and "Project" alternatives included in a RTP EIR or other related assessment), using their existing models. MPOs would work together with ARB to ensure that this analysis uses consistent long-range planning assumptions statewide, to the degree practicable, including, but not limited to:

- Existing and forecasted fuel prices and auto operating costs
- Reasonably available federal and state revenues
- Assumptions about fleet mix and auto fuel efficiency standards provided by ARB
- Demographic forecasts (e.g., aging of population and changes to household income and cost of living)
- Assumptions about goods movement-related travel impacts (e.g., heavy-duty trucks, rail, seaports and airport)

Each MPO's analysis would be made available to the public.

Step 2 ARB uses the results from Step 1 to compile greenhouse gas emission estimates for each of the MPOs individually in the base year of 2005 and the target years of 2020 and 2035. ARB staff would then meet with the MPOs to share those results, and make them available to the public for review. ARB staff would also compare baseline greenhouse gas emission estimates with MPO fuel use data for comparison. To the extent that there are differences, ARB will attempt to understand them. This would result in a greenhouse gas emissions "baseline" against which further reductions from regional strategies developed in Step 3 and 4 can be compared.

Step 3 Using a bottom up approach with input from regional and local officials and stakeholders, the MPOs would work with ARB to develop parameters for preparing sensitivity analyses and multiple scenarios to test the effectiveness of various approaches that would help identify the most ambitious achievable greenhouse gas emission reduction strategies for 2020 and 2035. ARB and MPOs are encouraged to coordinate and develop comparable packages across the regions. The policies and practices that could be incorporated into these alternative scenarios

include, but are not limited to, those identified in the BMP list and may include:

- Increased transportation funding and system investments in modes that will reduce greenhouse gas emissions, such as public transit, rail transportation, and non-motorized transportation
- Improved integration between land use and transportation policies, through means such as funding for supportive local infrastructure near public transit and funding for regionally coordinated preservation of natural areas
- Inclusion of policies that promote infill, higher densities, mixed uses, improved pedestrian and bicycle connections, and open space preservation
- Increased use of transportation demand management measures to reduce single-occupant vehicle (SOV) travel demand
- Increased use of transportation systems management measures that will improve system efficiency
- Including pricing options, such as express lanes, parking, and various fuel taxes
- Accelerated integration of more fuel efficient and clean fuels automobiles into the fleet mix than what is already required by adopted state vehicles and fuels programs
- Increased funding for and/or supply of housing affordable to the local workforce

In this step, the MPOs and ARB would also identify the data inputs and outputs that should be obtained from existing or new scenario assessments developed with existing travel demand and land use models, off-model tools, sketch planning analyses, or the BMP spreadsheet tool. The Committee recommends that the data outputs be related to the performance indicators discussed in the performance monitoring section later in this report and should be comparable from region-to-region, to the extent feasible.

Outputs may include those listed in the Performance Monitoring section, and may include:

- Greenhouse gas levels at target years
- Transportation performance measures
- Economic performance measures
- Other environmental performance measures
- Social equity performance measures
- Housing production performance measures

In identifying the measures to be used in developing these alternative scenarios, MPO staffs and ARB staff would use information from existing scenario assessments and cost-effectiveness studies wherever possible.

The list of measures, alternative scenarios and data outputs identified for each MPO will be made available for public comment.

Step 4 MPOs analyze the alternative scenarios using a sketch planning tool, BMP spreadsheet tool, or other acceptable means, and forward the results to ARB and make them available to the public, explaining the reasons for any difference in key outputs resulting from the various methodologies used to analyze scenarios. ARB would compile the results, and, combined with its review of empirical studies and other relevant information that relates to passenger vehicle and light truck greenhouse gas emissions (including new auto fuel efficiency standards and clean fuels), prepare a preliminary draft uniform statewide target for public review and comment.

At this time, an MPO may also submit a proposed regional target pursuant to provisions of SB 375.

Step 5 ARB considers feedback from MPOs and other stakeholders on the preliminary draft uniform statewide target, as well as any formal regional target submittals received as part of Step 4, to assess whether any region's target should be adjusted either above or below the preliminary draft uniform statewide target. Such revisions would be subject to a "reasonably tough test" and would ensure that each region's target is the most ambitious achievable (see page 6).

Step 6 ARB staff recommends draft targets to its Board.

Step 7 ARB, MPOs and others continue to exchange technical information and modeling results prior to final target setting by September 2010.

MPO and ARB shall encourage public participation in formulating alternative scenarios and determining outputs within the timelines noted below.

The process outlined above will require a significant effort by all participants within a relatively short period of time in order to allow ARB staff to submit draft targets to its Board by June 30, 2010 and final targets by September 30, 2010 in accordance with SB 375. Therefore, it is recommended that a specific schedule be developed by the participants, based on the following key milestones:

- Steps 1 through 4 should be completed as close to March 1, 2010 as possible (April 30, 2010 for the SCAG region);
- Steps 5 and 6 should be completed by June 30, 2010; and,
- Step 7 will be completed by September 30, 2010.

2. Expert Consultation

The Committee is convinced that input from technical experts in land use and transportation, both academic and practitioners, will be critical to the success of SB 375 implementation.

Specifically, the Committee recommends that ARB work with a group of technical experts and practitioners from the land use and transportation sectors to develop a list of BMPs. The BMP list would be needed by January 2010 to help inform the target setting process. The BMP list should be supported by the scientific literature and relevant case studies. If feasible and where supported by available data, the list should include elasticities associated with the BMPs. At a minimum, ARB should work with the technical experts to identify a range or general scale of the possible greenhouse gas benefits of the policies and practices identified in the BMP list.

Once the BMP list is developed, we recommend that ARB initiate the development of a BMP spreadsheet tool that could provide an assessment of the greenhouse gas emission reductions that may be achieved by implementing some or all of the policies and practices identified in the BMP list.

In addition, we recommend that ARB use its expert consultation process to review the analytical tools that use the empirical data associated with the BMP list of policies and practices. This may include the BMP spreadsheet tool, other sketch tools, or model improvements that are validated against the empirical data. This review would ensure that the analytical tools appropriately reflect the impacts suggested by the data and identify future research needs to improve the tools and empirical literature.

Finally, given that all MPOs employ travel demand models, and these models will provide data on the greenhouse gas emission reductions associated with the regional plans, the Committee recommends that ARB consult with land use and transportation modeling experts during its review of the MPOs' analyses. The Committee believes this input is critical to supplement ARB's existing technical capabilities and aid ARB in meeting its statutory obligation to determine the accuracy of the MPOs' emission reduction estimate.

3. ARB Stakeholder Process

A high level of transparency and outreach is key to the successful implementation of SB 375. Ensuring the public trust and establishing a system of transparency, public participation, and collaboration will strengthen the target setting process and SB 375 implementation. Because SB 375 covers numerous policy areas including: transportation and land use planning, housing affordability, and environmental assessments, crucial knowledge is dispersed over a large number of community stakeholders. For this reason, the public will need easy ways to quickly and easily access information on SB 375 implementation. Stakeholders can provide their

collective expertise and information to help ensure that regional targets will be the most ambitious achievable.

The Committee recommends that ARB continue to provide opportunities for involvement by a wide variety of stakeholders, including but not limited to: representatives of local governments; air districts; transportation agencies; homebuilders; academia and environmental, planning, affordable housing, public health, labor, and environmental justice organizations. Opportunities for stakeholder participation in the target setting process are essential to build public confidence.

In addition to conducting public meetings throughout the target setting process, ARB should continue to encourage the submittal of data and written comments through ARB's online public comment website. The public comment website could serve as a mechanism for: (1) soliciting public input and (2) developing a statewide repository for information on local policies and practices that reduce greenhouse gas emissions and support the goal of sustainable community design.

The Committee also recommends the RTAC be reconvened one additional time to review the results of the scenario planning efforts undertaken by the MPOs, as well as to review the BMP list and BMP spreadsheet tool. It is anticipated that this meeting will be sometime in early 2010. In addition to reconnecting the collective experience of the RTAC members with the target setting process, such a meeting will provide another focal point for public outreach and input.

4. State Agency Interaction

The Committee recommends that ARB continue to work closely with other state agencies that have a key role in land use and transportation planning to coordinate strategies so that they do not conflict with other state goals and priorities. SB 375 requires new ways of looking at the planning process for land use, transportation, and related fields. State agencies need to avoid sending conflicting signals to local and regional agencies as they proceed in implementing SB 375.

Currently, the California Transportation Commission (CTC) is working with ARB and the Department of Transportation (Caltrans) to update the RTP guidelines. The updated RTP guidelines will address changes to RTPs such as the inclusion of a sustainable communities strategy, and advise MPOs to begin planning for necessary improvements to properly evaluate the impacts of certain policies on greenhouse gas emissions in their region. In addition to participating in these efforts, Caltrans maintains the statewide transportation model, which includes interregional travel. The Department of Housing and Community Development (HCD) is responsible for ensuring that local housing elements meet requirements, which will have a new connection to the RTP process as a result of SB 375. As the planning and CEQA experts in the state, the Governor's Office of Planning and Research's (OPR) involvement is important to implementation statewide.

B. Target Setting Methods and Tools

1. Use of Empirical Studies

Empirical studies have a vital role to play in setting greenhouse gas reduction targets and designing strategies to meet those targets through changes in land use, transportation infrastructure and other transportation policies. The data derived from these studies can help define not only the expected range of VMT and greenhouse gas reduction that might result from various land use and transportation strategies, but also effective policies and practices that planning agencies throughout the country have found to be ambitious and achievable.

Empirical studies represent the only observations we have of actual travel behavior. When combined with information about transportation infrastructure investments, pricing, and other policy decisions, empirical data can be used to derive elasticity values for the impact of certain factors on VMT, greenhouse gases, and other metrics of concern such as vehicle hours of travel and congestion. Elasticity is a percentage change in one variable with respect to a one percent change in another variable, such as the percentage change in VMT for each percent change in development density. These elasticities can help to inform the setting of the targets and the evaluation of various scenarios for the SCS. MPOs can use these elasticities to better understand how various policy or investment changes affect VMT and greenhouse gases. However, empirical studies must be used with caution, as it is critical to include all important variables in the empirical relationships.

In the SB 375 context, the relevant empirical evidence consists of a set of cause-and-effect relationships observed to occur in real-world situations. The “causes” or inputs include land use strategies such as infill development, development mix, density, urban design (also known as the “4Ds”), affordable housing development, transportation strategies such as pricing, incentives, new transit service and service improvements, new roadway investments, operational improvements, and other forms of transportation demand management (TDM). The observed “effects” or outputs are changes in transportation system use over time, measured through empirical data that includes local, regional and state road and highway traffic counts, smog check odometer readings, transit ridership counts, household travel surveys, gasoline consumption data, bridge toll data, and observed counts of bicycle and pedestrian activity. Fortunately, significant attention has been paid to this subject in the scientific literature, and the group of experts that we recommend ARB convene will have existing work to draw from.

Empirical evidence lends itself to a variety of uses. Specifically, the Committee recommends the following:

- The most immediate use of empirical data is identified in this Committee’s recommendation that ARB, with expert consultation, develop a BMP list, and enhance it by providing, if available from the literature, a range of elasticities associated with each policy or practice. The empirical data would then be used to develop a BMP spreadsheet tool based on the BMP list. The technical experts

should review the literature and derive the most region-appropriate elasticity values possible, including any interaction between the various factors. If completed in time, the BMP list could be used by MPOs and ARB in the target setting process.

- Within the same general timeframe, ARB should use empirical studies as one means to estimate what order of magnitude of greenhouse gas reductions are possible from various policies in California's regions in 2020 and 2035 as part of their process to complete Step 4 – the preliminary draft uniform statewide reduction targets.
- Empirical evidence should also be used to calibrate and validate regional and state travel models. As discussed elsewhere in the report, the Committee is recommending ARB seek expert consultation to, among other things, derive elasticity values from the empirical evidence, appropriate to each region, and create anticipated sensitivities for each regional model. The experts would develop a list of elasticity values, and then work collaboratively with MPOs to determine that the models are generating the right answers, given the expected values. Observations of actual behavior responses to transportation investments should continually be used to refine and recalibrate model predictions.
- Empirical evidence can also be used to estimate the magnitude of co-benefits of implementing SCSs. Many Committee members discussed the importance of making the SB 375 process transparent and understandable to the public. These co-benefits can help to engage the public in the planning process and bring to life anticipated real-world impacts of particular policies under consideration.
- It is critical to understand and account for the interdependencies between policies including synergistic (positive and negative) effects.

2. Use of Modeling

This section of the report summarizes Committee discussions on the use of travel demand models and other modeling methods for SB 375 target setting and implementation. In our recommendations, we emphasize the need for MPOs to make modeling data and information regarding greenhouse gas emissions available to the public in a clear and transparent manner. A network-based travel demand forecasting model allows for simulation of complex interaction among demographics, land use, development patterns, transportation, and other policy factors. A rigorously tested and validated travel demand model with well documented expert peer review will add to the credibility of greenhouse gas estimates.

In this section, "travel demand models" refers to the computer models currently in use at MPO's for travel forecasting, ranging from relatively simple "four-step" models to more complex "four-step" models, to more sophisticated, activity-based simulation models. "Other modeling methods" refer in general to tools which either augment or replace travel demand models, and are likely to be spreadsheet-based tools.

Current use of Travel Demand Models

Each of the 18 MPOs in California uses and maintains a travel demand model for development and evaluation of its RTP. If ambient air quality does not conform to federal air quality standards, the travel demand model, along with associated emissions models, is also used for evaluation of progress towards these standards in the future. All MPOs have staff assigned to maintenance and operation of their travel demand models, though at widely varying levels, and all use consultants and outside contractors to periodically update and improve their travel demand modeling tools. Given that MPOs have invested millions in travel demand models that have an integral role in land use and transportation planning to date, MPOs and ARB should leverage these long term investments by using travel demand models for SB 375 implementation.

Committee discussions on travel demand models

The Committee, with assistance from ARB and MPO staff, focused on two major implementation issues with respect to the use of models:

- The potential role for models to inform target setting
- The role for models in SCS and APS development and target compliance demonstration

The range of discussion on the use of models for target setting and demonstration of target compliance was defined primarily by an acknowledgement that all MPOs employ travel modeling, with varying levels of capability. In the course of this discussion, a detailed self-assessment of travel demand models (as well as other subjects) was prepared and presented to the Committee (see Appendix A). This assessment revealed significant variations among the travel demand models in use by MPOs, both in terms of model capabilities and key assumptions used by the models. Accordingly, the Committee concluded there was a need to augment travel demand models with other methods to achieve reasonable levels of sensitivity for SB 375 implementation purposes. These other methods include:

- “Best Management Practices” or “BMPs”, wherein a comprehensive list of greenhouse gas reduction policies and practices would be assembled, and a BMP spreadsheet tool would be developed for determining the level of greenhouse gas reduction that could be achieved by implementing a particular policy or set of policies.
- “Post processor tool”, wherein MPOs would apply the tool to adjust outputs of their travel demand model such that they account for areas where the model lacks capability, or is insensitive to a particular policy or factor. The most commonly referred to post-processor in the Committee discussions was a “4D’s” post-processor (see pages 15-16), but post-processors could be developed for other non-D factors, too.

Recommendations on the use of models for SB 375

Throughout its discussion, the Committee came to appreciate how complex modeling systems can be, and as a result, we recognize the vital importance of transparency in the modeling process. Within the context of improved transparency, the Committee recommends that use of travel demand models and other modeling methods for SB 375 implementation include four steps: 1) assessment and documentation of existing travel demand model capability and sensitivity; 2) incorporation of social equity factors in the target setting process to the extent modeling or "off-modeling" methodologies exist[1]. Social equity factors include, but are not limited to, housing and transportation affordability, displacement/gentrification, and the jobs-housing fit, 3) development of a model improvement program which is consistent with federal requirements and addresses identified modeling needs, including, if possible, housing affordability and other social equity factors, as well as the ability to quantify the full suite of co-benefits listed on page 42 by the second round of SCS/APS development; and 4) development of short range improvements and other methods to address modeling needs for first round target setting and SCS/APS development.

When applying models in target setting and/or demonstration of meeting the target, inherent modeling uncertainties due to input data quality, assumptions, existing modeling capability, and sensitivity need to be well documented.

Travel model assessment and documentation

SB 375 requires that MPOs "…disseminate the methodology, results, and key assumptions of whichever travel demand models it uses in a way that would be useable and understandable to the public." Cal. Govt. Code § 14522.2(a). This portion of the Committee's recommendation is intended to address this section of the bill, as well as identify areas of needed improvements to travel demand models. The travel model assessment should cover the travel demand model factors and policies identified in the "MPO Self-Assessment of Current Model Capacity and Data Collection Programs" presented to the Committee in May 2009 (Appendix A), as well as any additional factors necessary to measure a region's job-housing fit.

If the documentation is highly technical in nature, a summary of the assessments and sensitivity testing should be prepared which would be more generally understandable by a non-technical audience.

Depending on the factor or policy, the assessment recommended in this section may include:

- Key validation statistics, showing the correspondence of the model prediction for a validation year to empirical data.
- Results of experimental sensitivity tests, wherein a single factor or variable is adjusted higher and lower from its baseline value, with the corresponding

[1] *See, e.g.* MTC's Transportation 2035 RTP, "Equity Analysis Report for the Transportation 2035 Plan of Change in Motion": http://www.mtc.ca.gov/planning/2035_plan/equity.htm.

changes in model output variables shown. Minimally, the outputs shown would be: total VMT; light-duty vehicle VMT total and per capita; light-duty vehicle greenhouse gas total and per capita; total person trips; person trips by automobile modes; person trips by transit modes; and person trips by bike and walk modes.

- Results of planning scenario tests, wherein the modeled results of planning scenarios are tabulated and correlated to show the overall sensitivity of the travel demand model to a combination of factors and policies included in the planning scenario.

Experimental sensitivity testing could be performed on all exogenous input variables (e.g. age, income, automobile operating costs), recognizing policy makers have little control over such variables, and for as many policy variables as are feasible given the structure and complexity of the model (e.g. transit fares, highway capacity, density, mix of use, pedestrian environment, transit proximity, etc.). The documentation of the sensitivity tests should identify the range of reasonable sensitivity based on research literature, and account for where in this range the travel demand model sensitivity falls. Ideally, the range of reasonable sensitivity to key factors and policy variables should be determined through a coordinated research synthesis and review process, the results of which would be a standard reference for all MPOs in the state.

Where results of planning scenario tests are reported, the MPO must show a correspondence between the planning scenario test results and the experimental, single factor sensitivity testing. Part of this documentation should assess the degree of interaction of factors and policies (i.e. the difference between the sum of all scenario variables taken individually, and the total change in modeled results).

The assessment and documentation should identify areas where the model lacks capacity for analysis of a factor or policy, and any factors or policy for which the model sensitivities fall outside the range of results documented in research literature.

As detailed elsewhere in this report, the Committee recommends ARB, with expert consultation, evaluate the ability of the MPO model to accurately predict the greenhouse gas impacts of implementing land use and transportation strategies. If the assessment results in changes to the self-assessment reported to the Committee in May 2009, this information should be provided to ARB staff.

Model improvement program

Based on the assessment described above, each MPO should develop a multi-year program of improvements needed to address any modeling needs, including, as applicable, incorporation of relevant housing affordability and other social equity factors. Improvements should describe the basic change which would be made to the MPO travel demand model, identify what data would be required to support the improvement, provide order-of-magnitude cost estimates, and identify any phasing issues or dependencies on other projects in the program.

Phasing of the improvements should address the following timeframes: 1) what improvements might be implemented in time to affect an MPO-proposed greenhouse gas reduction target; 2) what improvements are possible to implement before the first SCS/APS development by the MPO; 3) what improvements are possible to implement before the second SCS/APS development; and 4) what improvement are affordable to the MPO within available funding.

The Committee recognizes that each region is unique and that strategies that are appropriate to one region may be less effective or less applicable elsewhere. MPOs that do not identify model improvements to account for key factors and policies should provide an explanation for their decision to ARB.

Since model improvement is a long term objective, MPOs should refer to the RTP Guidelines as updated by the California Transportation Commission in response to the requirements of SB 375.

Additional short range improvements or other methods

It is likely that many MPOs will not be able to identify projects to improve their travel demand models to address significant modeling needs prior to proposing their own greenhouse gas reduction target to ARB, or prior to the development of the first SCS/APS for the region. Additionally, structural limitations in the model may also require other methods to fully address a modeling need. Where either is the case, the MPO should prepare a program of short range improvements and other methods to address this need prior to the development of its first SCS/APS.

Other methods could include the use of BMPs or a post-processor approach as described above. These other methods should rely on travel demand model outputs for all factors and policies where the model can be shown to be reasonably sensitive. If a capacity is represented in a travel demand model, but model sensitivity is not reasonable, the other method should be tailored to compensate for the insensitivity. If the capacity to model a policy or factor is absent from the travel demand model, another method should be implemented to provide the needed capacity. However, where any other method is used to account for a missing travel model capability, the MPO must demonstrate a reasonable approach for ensuring that the other method does not double-count or over-estimate the likely impacts of the policy or factor.

3. <u>Identification of Key Underlying Assumptions</u>

The Committee recommends that the MPOs and ARB clearly identify the key underlying assumptions included in both the targets and the MPO's determination of how it has met its targets. The assumptions range from population estimates to transit funding assumptions to predicted benefits of ARB's vehicle and fuel regulations. This transparency will be critical to the information exchanges between ARB and MPOs as

part of the target setting process, as well as in assessing the need for future target adjustments when the underlying assumptions change.

It is especially important that MPOs clearly document for ARB their assumptions made with regards to current economic activity as it relates to current and future residential and commercial development (including housing affordability relative to wages, as available), current and projected economic activity as they relate to future rates of growth and development, as well as assumptions made with regards to current and future levels of transit and local government funding. Assumptions on economic activity and funding levels will be fundamental to understanding the level of change needed to meet the targets. If assumptions on these items vary by region, ARB should work with the MPOs to indicate such and provide sufficient documentation throughout the SB 375 process.

4. Best Management Practices

The Committee recommends the development of a list of Best Management Practices (BMP) and a related BMP spreadsheet tool over the next four to six months. These tools, which should be placed in the public domain free of charge for all stakeholders, should be used for five purposes:

1. One of several methods ARB uses for target setting;
2. Greenhouse gas reduction strategy development;
3. Target compliance demonstration by small MPOs in the first round and as an action plan to supplement model compliance by all MPOs;
4. ARB to use as tool to determine the accuracy of each MPOs greenhouse gas reduction estimate, as required by SB 375; and,
5. A user-friendly tool to facilitate public review of the greenhouse gas reduction strategy for all MPOs.

The BMP list consists of available land use and transportation policies and practices that will result in regional greenhouse gas reductions. The BMP spreadsheet tool would determine the approximate level of reduction that could be achieved by implementing a particular strategy or set of strategies in a particular setting. These tools would allow regions and, ultimately, local jurisdictions to make appropriate greenhouse gas reduction policy choices for SCS development and implementation based on sound science while more sophisticated land use and transportation models are being developed and refined. The BMP list and spreadsheet tool should only include policies for which either empirical studies or travel models exist to estimate the likely impacts of their implementation. The BMP list and BMP spreadsheet tool can serve as initial screening tools that facilitate decision making and may also serve as tools to facilitate the development of more sophisticated transportation/land use models and measurement of implementation performance. Most importantly, they can enhance early implementation of policies and practices under SB 375, which has a 25-year-plus horizon encompassing at least five to six rounds of RTPs.

BMPs also provide a tool that can be applied locally by planning commissions, city councils and county boards to successfully implement SCS strategies during their planning processes. Local jurisdictions are on the front line that will implement SB 375 as part of their general plan process and everyday planning decisions. BMPs provide transparency to the end-user and decision-maker by providing a relatively quick assessment of respective strategy benefits.

The following sections describe how BMPs can be designed and applied to SB 375 target setting and compliance demonstrations.

In order to be a timely, relevant tool for the uses mentioned above, the Committee recommends that the BMP list and BMP spreadsheet should be developed and peer-reviewed over the next 4-6 months by ARB through an expert consultation process, involving a group of transportation and land use technical experts and practitioners. As part of this process, the limitations of the BMP spreadsheet should be clearly discussed.

It is envisioned that the BMP list will be based on:

- consultation with MPOs;
- a comprehensive literature review on land use and transportation strategies that have been implemented and demonstrated to reduce greenhouse gases;
- policies contained in current RTPs/congestion management plans (CMPs); and
- input from MPO member jurisdictions, the consultant experts and the public.

The BMP spreadsheet tool should be a single spreadsheet tool, which is adaptable enough to address a range of conditions across all MPOs and all communities. It should be developed with a user interface to estimate, to the extent possible, the combined greenhouse gas reduction effects of BMP policies and practices while accounting for regional differences. In addition to selecting various policies and practices to test, users could provide other related land use and transportation information about the area being analyzed such as whether the area is rural, urban, or suburban; employment density in urban core; estimated share of work trips made by automobile; or total seat-hours of transit service per weekday per capita. The BMP spreadsheet tool would in turn calculate the VMT and greenhouse gas reduction estimates. The effectiveness of the BMP policies and practices would be based on empirical studies and modeling results, taking into consideration prerequisite conditions, interdependencies, and potential synergistic (positive and negative) effects.

In developing the BMP spreadsheet tool, a set of criteria should be considered. Some of these criteria could include:

- identification and accounting for synergistic (positive and negative) effects;
- ability to analyze strategies on a regional, local, or project level;
- financial constraints;
- resource constraints;
- consistency with federal air quality regulations;
- fuel prices; and
- information from peer reviewed publications.

Committee members carefully examined the capabilities and limitations of using BMPs and recommend that they be used for the purposes described above. When applying the BMP spreadsheet tool, care should be given to the design of strategies, since sub-regional variations may not be adequately tailored. Also, careful consideration should be given to the complex interactions between transportation and land use that may not be fully accounted. Expert consultation could assist in the appropriate application of the BMP list and spreadsheet tool.

The Committee fully supports the development and ongoing use of the BMP list and BMP spreadsheet tool, recognizing that these will continue to evolve as new data and information get added to the empirical literature. In the short term, BMPs will be used in multiple roles, particularly as integrated land use and transportation models and input data quality are being developed and/or improved. Over time, the Committee envisions that these BMP tools will likely find the highest value as a communication tool to help discuss greenhouse gas reduction strategies with the public and local governments in a transparent and clear way, and as screening tools for local and regional scenario development and decision making.

Regardless of the tools used to demonstrate compliance with the greenhouse gas reduction targets, SB 375 does require regions to develop an SCS or APS that includes a development pattern and a transportation network designed to achieve their target. It is essential both for public outreach and understanding of a region's strategy, as well as for environmental review and implementation of CEQA reforms, that the regions clearly outline where new growth is intended and how the transportation network will serve the region's travel needs.

5. Flexibility in Achieving Targets

The Committee recommends that ARB allow for flexibility to implement innovative land use and transportation strategies to help meet the targets. As such, it is appropriate for MPOs to use, with sufficient documentation, transportation sector greenhouse gas reductions that are not on the BMP list provided that sufficient evidence exists to reliably predict the magnitude of GHG reductions of their implementation. In addition, if MPOs can create programs that exceed the state's adopted performance standards for vehicles and fuels, they may receive credit for local/regional innovation. Greenhouse gas reductions not related to the land use and transportation sectors should not be credited towards meeting of SB 375 targets.

To help facilitate this option, ARB should communicate to MPOs and others what its expectations are with regards to creditable strategies and submission of strategy documentation to determine the accuracy of various methodologies that may be proposed.

6. Base Year

The Committee recommends a current base year of 2005, such that MPOs would be required to achieve per capita emissions reductions equivalent to some percentage below their 2005 per capita levels by 2020 and 2035. A current base year is preferred over a future base year since it relies on recent, existing information and is less sensitive to varying assumptions. Although 1990 was discussed as a potential base year to be consistent with AB 32, MPO representatives indicated regional transportation and land use data are not of a good enough quality to support its use as a base year. Additionally, many of the most recent RTPs and Blueprint scenarios have modeled year 2005 as a base year which would reflect current conditions between regions. Use of a 2005 base year also helps give regions credit for actions already taken to reduce greenhouse gas emissions.

7. Target Metric

The Committee recommends that ARB express the targets in terms of a percent reduction in per capita greenhouse gas emissions from 2005 levels. This metric is preferred for its simplicity, since it is easily understood by the public, can be developed with currently available data, and remains a widely used metric by MPOs today.

In addition, this form of metric has the advantage of directly addressing growth rate differences between MPO regions. Addressing growth rate differences between the MPO regions is important given that growth rates are expected to affect the magnitude of change that any given region can achieve with land use and transportation strategies. The relative characteristic of the metric ensures that both fast and slow growth regions take reasonable advantage of any established transit systems and infill opportunity sites to reduce their average regional greenhouse gas emissions.

Furthermore, this target metric also helps give regions some “credit” for early actions taken to reduce greenhouse gas emissions. The percent reduction characteristic of the metric gives regions that have taken early actions and, as a result have a low level of greenhouse gas emissions per person, responsibility for a lower total reduction compared to regions that start with a higher level of greenhouse gas emissions per person.

8. 2020 and 2035 Targets

The Committee recommends that ARB use a consistent target setting methodology for the 2020 and 2035 targets. Transportation and pricing strategies may realize considerable greenhouse gas emission benefits in the near-term (i.e., 2020), while improved land use planning initiated in the near-term may achieve its most significant greenhouse gas benefits over the long-term (i.e., 2035 and beyond). Therefore, the factors considered in development of the 2020 target may necessarily be different than those for the 2035 target. The methodology to develop those targets, however, should

be consistent to provide certainty to MPO planning efforts and comparability between the 2020 and 2035 targets.

9. Accounting for Statewide Fuel and Vehicle Technology

The Committee recommends that ARB provide MPOs with information on the anticipated greenhouse gas emission reduction impacts of the adopted Pavley regulation and Low Carbon Fuel Standard (LCFS). SB 375 requires ARB to take into account improved vehicle emission standards, changes in the carbon-intensity of fuels and future measures to further reduce greenhouse gas emissions from these sources when setting the targets, in addition to reductions from other sources. Given ARB's expertise in the models and tools to evaluate the Pavley regulation and LCFS and its responsibility for their statewide implementation, it is the appropriate agency to provide information on the benefits of these measures to the MPOs. This information will enable the MPOs to account for these benefits in a consistent manner across the state. ARB should also provide to the MPOs the potential benefits of future measures to further increase fuel efficiency and shift the state's transportation fuel mix.

10. Statewide Assumptions

The Committee recommends that ARB require MPOs to use consistent key assumptions across the state where appropriate. Model outputs vary with differing model input assumptions, especially for those to which a model is most sensitive. Certain key assumptions therefore should be consistent statewide to ensure equitable assessments of MPO model outputs, including scenarios. For instance, ARB could recommend a set gasoline price for use by MPOs in their transportation models. ARB also could recommend consistent assumptions for use when developing population and employment projections, although actual rates of population and employment growth are expected to vary considerably by region.

Current Economic Conditions

Current economic trends include a nationwide recession which has impaired the ability of state government to provide reliable and steady funding for community planning and infrastructure delivery. The State of California in its recent budget severely curtailed resources for transit services and redevelopment. These resources are essential to support sustainable development – both at the planning and implementation stages – by local governments and transit agencies. The effects of the recession are expected to continue for at least the near term.

The Committee is sensitive to the need for the current and future economic trends to be taken into account in determining what is actually achievable. However, the Committee was also confident that the forecasting methods currently required in the RTP process will reflect changes in the economy, and account for economic fluctuations over time. Thus, the impact of the recent unusually severe recession and economic restructuring

will be reflected as these forecasts are updated for regional plans developed under SB 375.

11. Interregional Travel

The Committee discussed four types of interregional trips and recommends a general approach for accounting for the impacts based on the type of trip. The four types include:

- Trips that begin in one SB 375 MPO region and end in another SB 375 MPO region after crossing their shared boundary (MPO-to-MPO);
- Trips that begin outside of an SB 375 MPO region, travel across some portion of the region, and end outside of the region (through trips);
- Trips that begin in an SB 375 MPO region but do not end in an SB 375 MPO region (interstate, international, tribal land, and military base trips); and,
- Trips that end in an SB 375 MPO region but do not begin in an SB 375 MPO region (interstate, international, tribal land, and military base trips).

In general, we recommend that an MPO's ability to affect emissions from these trips through land use and transportation strategies should be a key factor in determining how trip emissions are apportioned among MPOs. For the first trip type, the Committee recommends that the travel associated with an MPO-to-MPO trip generally be split equally between the two MPOs. In most cases, each region has an equal opportunity to affect emissions from trips that regularly cross over their shared boundary, and therefore should equally share responsibility for reducing those emissions. However, ARB may adjust trip assignments in extraordinary cases based on consultation with affected MPOs.

An MPO's ability to affect emissions for the remaining types of trips is less clear, and in cases where there is significant question, responsibility for the emissions associated with these trips should be determined by ARB on a case-by-case basis after consultation with Caltrans and the appropriate MPO. In general, however, the Committee recommends that an MPO should not be responsible for through trips, and should take responsibility for half of the trip that has either an origin or destination within the MPO region.

12. Achievability and Ambitiousness of Targets

Definition

The Committee has done its best to come to an understanding of the true meaning of ARB's phrase: ambitious achievable targets. On the one hand, several Committee members emphasized the importance of achievability of the targets to show early success and build community support for implementing SB 375. On the other hand, Committee members agreed that the targets need to be set to help put California on the path to achieving the state's ambitious climate goals by 2050. With respect to ambitiousness of targets, there was general support for a method of target setting that

supports regional actions well beyond business as usual in land use and transportation planning and policy.

The ambitious achievable discussion necessarily led into the pros and cons of regions meeting their targets through sustainable communities strategies rather than alternative planning strategies. While the Committee believed it would be preferable if most MPOs could meet their targets with an SCS, the desire was also expressed that targets should not be set low *simply* to allow MPOs to meet their targets with the SCS. On balance, the Committee recognized that every region should do everything it feasibly can do reduce greenhouse gas emissions.

As part of this, the Committee believes that the fiscal constraint requirements of the federal planning process should not become barriers to setting targets by ARB pursuant to SB 375. During target setting, SCS/APS development, performance monitoring and target updating, the MPOs and ARB should identify their assumptions about economic conditions, funding levels and other relevant factors, as well as comment on how key factors may have changed during the implementation process (See Current Economic Conditions Section, page 25).

Whether or not a region is able to actually hit their target with the SCS, the legislative intent of SB 375 is clear: an SCS must reduce greenhouse gas emissions to the greatest extent feasible. When implementing Step 3 (see page 10), ARB will look to see whether or not the SCS contains the most ambitious achievable level of effort. What this means is that if certain regions cannot quite meet their targets with the SCS, but instead have to create an APS, their SCS will still be a substantial improvement over business as usual land use planning, and their regions and member cities will all see substantial co-benefits as a result of implementing the SCS – even if it doesn't quite meet the target. In addition, even if a region must prepare an APS, that alternative scenario must still represent "the most practicable choices for achievement of the greenhouse gas emission reduction targets." Cal. Govt. Code § 65080 (b)(2)(H)(iii).

Application

While the Committee had hoped to have more time to move beyond a theoretical conversation about ambitious achievable and into defining specifically what it means in terms of policy assumptions and actual reductions, we did make some progress. The scenario modeling that will occur over the next few months should provide better information on what constitutes the most ambitious achievable greenhouse gas emissions reductions possible within the regions. That work will help define the upper ranges of savings possible. The Committee looks forward to reconvening to review the regions' scenarios in the coming months and will likely provide additional guidance on ambitious achievable at that time.

Finally, the Committee recognizes the unique nature of each region and that a one-size fits all approach to implementing regional strategies to achieve greenhouse gas reduction targets is not appropriate.

III. RTAC Recommendations on Implementation

A. Housing and Social Equity

A guiding principle of the Committee is to maximize social equity, and this principle is incorporated in the recommendations of this report. Social equity policies and practices that have the potential to reduce VMT (such as provision of appropriately located affordable housing that matches well with local wage levels) must be elevated on the list of Best Management Practices that MPOs consider in developing their SCS. Accomplishing this will require ARB to designate social equity as an area of future research that ARB will conduct or direct be undertaken in the efforts to identify empirical evidence and then enhance modeling and monitoring. It will also require MPOs to engage low income communities in the SCS development process.

The affordability of housing and transportation and access to employment play a critical role in determining where Californians live, how much they travel and, therefore, directly affect the level of achievable greenhouse gas reduction. Land use based greenhouse gas reduction strategies, however, could have beneficial or adverse effects on social equity concerns such as housing affordability (increased land prices), transportation access and affordability, displacement, gentrification, and a changing match between jobs, required skill levels and housing cost ("jobs-housing fit"[2]). Inequitable land use practices and inadequate public transit access as well as economic and racial segregation can result in exclusion, limitations on employment opportunities, sprawl and excess VMT. Implementation of SB 375, accordingly, should, at a minimum avoid facilitating or exacerbating any adverse consequences, work in concert with state housing element law to achieve the state housing goals, and look for ways in which social equity strategies could improve greenhouse gas reduction.

Findings

The RTAC recognizes that increasing housing and transit affordability, and improving the jobs-housing fit in the SCS forecasted development areas should increase greenhouse gas reduction. It also recognizes that to ensure that greenhouse gas reduction targets are ambitious yet feasible and reasonably achievable, a) the methodologies utilized by the ARB and MPOs should analyze social equity factors to determine their greenhouse gas reduction benefits and b) the SCS/APS should consider and attempt to avoid adverse social equity consequences and should include social equity practices to the extent their greenhouse gas reduction benefits can be demonstrated. Incorporation of social equity factors is complimentary to the civil rights and environmental justice considerations required of regional transportation plans by federal and state law. At the same time the RTAC finds that existing modeling tools will need substantial upgrading to analyze and incorporate social equity factors into ARB's

[2] The extent to which the homes in the community are affordable to the people who currently work there or will fill anticipated jobs.

target setting and measurement of greenhouse gas reductions, and that appropriate research and development will be needed in the first period of implementation.

Recommendations

The Committee makes these specific recommendations:

- Social equity factors should be incorporated in the 2010 greenhouse gas target setting to the extent modeling or "off-modeling" methodologies exist[3] and in subsequent adjustments to the targets pursuant to Cal. Govt. Code § 65080(b)(2)(A)(iv). Social equity factors include, but are not limited to, housing and transportation affordability, displacement/gentrification, and the jobs-housing fit.
- ARB should take all steps necessary to ensure completion of the appropriate research and model development so that social equity factors are fully incorporated into the greenhouse gas modeling for the second SCS round and before any adjustments to the targets.
- Adverse social consequences of changing land use patterns, such as displacement, gentrification and increased housing costs should be addressed and specifically avoided to the extent possible in the SCS/ACS submitted by MPOs pursuant to Cal. Govt. Code § 65080(b)(2)(I)(i) and in the SCS/APS submitted to ARB pursuant to Cal. Govt. Code § 65080(b)(2)(I)(ii).
- To the extent adverse social consequences cannot be avoided they must be mitigated to the extent feasible.
- Social equity practices that avoid adverse social consequences and will lead to greenhouse gas reduction may be included among the BMP.
- ARB should encourage the MPOs to develop and enhance "visioning" tools that enable the public and policymakers to clearly see the social equity impacts of various planning scenarios and make informed choices. These include impacts on air quality, access to transit, household transportation costs, housing costs and the overall housing supply.

Statutory Authority

Cal. Govt. Code § 65080(b)(2)(A) [RTAC may consider impacts of jobs-housing balance & greenhouse gas reduction benefits from land use & transportation strategies]; Cal. Govt. Code § 65080(b)(2)(B) [SCS must identify areas to house all economic segments and must consider state housing goals]; Cal. Govt. Code § 65080.01 ["Feasible" means capable of being accomplished, taking into account economic & social factors among others]; Cal. Govt. Code §§ 65580-65589.8 [State housing goals and state housing element law]

B. Local Government Challenges

The Scoping Plan uses the term "essential partner" when describing the important role that local government will play in achieving reductions in greenhouse gas emissions. SB 375 poses a new set of challenges for local government and the findings correctly state that "local governments need a sustainable source of funding to be able to accommodate patterns of growth consistent with the state's climate, air quality, and energy conservation goals." SB 375 also recognized the importance of rural sustainability and acknowledged the importance of financial incentives for local governments that fulfill this role. SB 375 specifically acknowledged the fiscal dilemma for jurisdictions that do not pursue development, but rather contribute towards the greenhouse gas reductions by protecting resource areas and farmland. The challenge will be to reconcile these goals with the responsibility of local governments to create safe, healthy, economically diverse, and fiscally sound communities.

The Growth Issue

Cities and counties are required by the state to plan and zone for housing for a growing population and they must continue to grow their local economies in order to pay for infrastructure and services and provide local jobs while they work to reduce carbon emissions. The Committee believes strongly that SB 375 is not a "no growth" bill and should not be implemented in a manner that turns it into one. Local agencies will need tools, such as education, retraining, state financial assistance, revenue raising authority, and loans and credits to make a smooth transition. Without such resources, it will be difficult to ask local elected officials to make decisions that may reduce emissions while, in some instances, placing economic burdens in their communities.

The Planning Challenge

SB 375 envisions that local governments will ultimately amend their general plans and zoning to help implement the SCS adopted by the MPOs, but it does not appropriate any new funds for this purpose. A companion bill, SB 732 makes $90 million available for MPOs and local governments for "sustainable planning," but this is not nearly enough when a typical general plan (including public outreach and CEQA review) can exceed $500,000 in a small community and millions in larger ones. Planning departments rely on city or county general funds and on developer fees to fund staff positions and both of these revenue sources have suffered in recent years. In the current economy, many have had to cut back planning staff—precisely at the time more planning is needed if SB 375 is to live up to its promise. Planning resources for RTPs and compatible local general plans will be critical to the success of SB 375.

The Infrastructure Challenge

Mixed-use, higher-density development in infill areas must often overcome deficiencies in existing infrastructure such as inadequate sewer or water capacity. Other infrastructure needs can include items such as fire equipment appropriate to each

community's development pattern, walkable paths, usable bike lanes, and quality open space. The current state budget issues have diminished the ability of cities to address these deficiencies by reducing redevelopment funding. In addition, current transportation funding available for operations and maintenance of the city, street, county road and transit systems falls woefully short of the needs. Further, the local transportation system serves as the right of way for transit and other alternative modes, and thus will be relied upon even more in meeting the SB 375 goals. California's fiscal structure severely constrains the ability of local agencies to raise revenues to address these needs. Developers can only be required to pay their proportional share of the impact, not for repairing existing deficiencies. And, it is difficult for local agencies to get voter approval on measures that require a two-thirds majority for any reason, let alone to support new development.

Conflicting State Mandates and Policies

The Committee believes the state must work to reconcile conflicting mandates and policies. The most recent example of conflicting state policies is the disconnect between a emissions reduction strategy that encourages infill in built out areas and the current state budget that redirects the best source of funding for such development: redevelopment dollars. Another example is the 2009-10 Budget Act reduction of subvention payments to cities and counties, which is part of the Williamson Act's critical effort to preserve farmland. Another concern is the conflict between reducing greenhouse gas emissions by locating more housing within existing transit corridors and the public health risk caused by existing air particulates in these same areas. Similar conflicts will arise with budget proposals to eliminate basic operations and maintenance monies for transit and the local transportation system and a number of other policies.

Making it Understandable

As the branches of government closest to the people, it will often be up to city and county officials to act on and explain the reasons for carbon saving strategies. These officials will need support in developing reports and information and packaging it in a way that the broader public can easily understand. If the public is confused or cannot draw a connection between the action taken and the benefits to the community, they are likely to object and register their dissatisfaction next time they vote.

Resources as Incentives

The resources needed to achieve the SB 375 goals and encourage the necessary land use changes and appropriate transportation strategies, are many. Planning monies are needed for comprehensive general plan updates compatible with the new SCS and RTPs. Acquisition and conservation monies should be targeted to jurisdictions that have resource areas. Transportation revenues available to regional agencies for expansion and capital improvements should be targeted to those cities and counties with general plans and programs that are consistent with regional plans that achieve

ARB set greenhouse gas targets. Consistent with SB 375, financial incentives should be made available to jurisdictions that preserve resource areas and farmland.

To help local government overcome these barriers, the Committee discussed the need for supportive action by the State and federal government. The Committee also discussed the idea of new local government authorities to aid implementation. These three concepts are discussed in the following three sections.

C. Incentives for Exceeding Target

The Committee believes that finding ways to reward regions in implementing SB 375, beyond the streamlined environmental review provided by the bill, will increase the chances of success. Further, the Committee believes that there are advantages to having MPOs meet their targets with SCSs in the first round of implementation. Therefore, finding ways to make it easier, better, faster and more rewarding for the community, developers, residents, and local governments to develop SCSs that meet or exceed targets is key. The Committee discussed a number of incentive programs that could be applied at the MPO or local level. Some of these concepts can be developed within the current SB 375 framework. In fact, the Committee's recommendations regarding flexibility in implementation and the use of BMP lists or BMP spreadsheet tools are ways to make development of SCSs easier.

The Committee recognizes that there will be cost to local and regional governments to develop and implement sustainable community strategies. At the same time, co-benefits will come from the actions taken. The Committee expects additional public input on the costs will come forward as SB 375 is implemented and recommends that the state work with the MPOs and local governments to identify those costs, as well as potential funding opportunities and new priorities within existing programs. The Strategic Growth Council (SGC) was codified by Senate Bill 732 (Steinberg, Chapter 729, Statutes of 2008). The SGC, among other responsibilities, is tasked with distributing Proposition 84 funds to encourage sustainable land use and transportation planning. The SGC should look for opportunities like those listed below to reward forward thinking local governments. Proposition 84 funds represent one funding source for SB 375 implementation.

The Committee believes that local governments themselves are perhaps in the best position with public input to identify the list of ideas that can facilitate forward thinking local action. Although local governments do not have a specific mandate imposed under SB 375, the Committee understands that local governments play a critical role in implementing the SCSs developed by MPOs and encourages incentives for their participation. The ideas listed below can be a starting point for discussions. ARB and the MPOs, with their technical capability, could develop methods to link the incentives to the benefits of the local action. The input of experts and practitioners, including the business community, local jurisdictions, social equity and labor advocates would be needed.

The following are incentive concepts the Committee recommends for consideration.

Recognition program: The state could consider developing a statewide award and recognition program similar to existing 'green recognition and certification' programs like LEED, Green Point Rated, and others. The program should be created to recognize regions that exceed targets, or local jurisdictions that meet specified standards related to SB 375 implementation.

Regulatory relief: The state could look for opportunities to provide additional environmental review or other regulatory relief for regions that exceed targets or local jurisdictions that meet specified standards related to SB 375 implementation.

Monetary grants from future Cap and Trade program revenues: The state could set aside a portion of future Cap and Trade program revenues exclusively for grants to regions that exceed targets, or local jurisdictions that meet specified standards related to SB 375 implementation.

Discretionary Awards: In regions that exceed their targets with an SCS, local governments could earn discretionary funding for infill amenities, like streetscapes, downtown parks or public spaces.

Technical Assistance to Help Meet Community Needs: In regions with exceptional plans, areas with challenges could earn support for technical assistance on things like improving neighborhood schools and or school facilities in targeted areas.

Financial assistance for innovative programs: Local governments can earn funding for innovative programs like ZIP cars or bicycle sharing programs.

Rewards for collaborative planning: MPOs could earn rewards for planning collaboratively with other MPOs on shared interregional challenges. MPOs could collaborate on both technical issues including transportation and land use modeling as well as interregional strategies to reduce greenhouse gas emissions. Similarly, plans that show exceptional intraregional collaboration to meet MPO regional targets, could also earn rewards.

D. State Actions to Support Implementation

During Committee meetings, the most frequently cited barriers to successful SB 375 implementation were cuts to public transit funding, and the lack of funds for jurisdictions to create new community-based plans, change zoning and do programmatic environmental reviews. Throughout the course of the Committee discussions some members have suggested new authorities as one means to overcome barriers to MPO and local agency implementation of SB 375.

The responsibility for developing an SCS falls on MPOs, and much of the implementation falls to transportation commissions and local governments. While many

MPOs have put in place exemplary policies and visions to create additional transportation choices, significant portions of their operating budgets are committed to maintenance and operation of existing systems, and only a small percentage is typically available to create new transportation options. Similarly, local government planning funding is in short supply, and existing planning staffs are struggling to keep pace with current planning demands, leaving little capacity for comprehensive, sustainable long range planning. These entities would benefit from additional funding, other mechanisms, and incentives to realize their visions for mixed-use, walkable communities with transportation options.

The Committee recommends the State consider the following actions to support the implementation of SB 375.

Transit Funding

- One of the underlying assumptions of SB 375 is that by better linking transportation, housing, and land use planning, incentives will be created for mode shifting that will increase demand for alternative transportation options, including transit, and, as a result, decrease greenhouse gas emissions. Therefore, the committee believes that successful implementation of SB 375 will depend on our ability to meet this increased demand for transit options.

  However, California's continued trend of eliminating state sources of transit capital and operating funds presents an implementation dilemma. Without restoration of state sources of transit funding that are reliable and long term, it will be unrealistic for transit to meet any increased demand in services. This will diminish the state's ability to achieve its greenhouse gas emission reduction goals.

  The Committee urges the state to address this discontinuity between the elimination of state transit funding in its budget and the mandates of SB 375. Public transit is a key tool for achieving the objectives of SB 375, and sustained and consistent investment in alternative transportation modes will be essential to support the development and implementation of RTPs (and SCSs) that will get needed emissions reductions.

  The Committee recommends several strategies throughout this report to restore and enhance funding to local governments and transportation agencies so they can adequately plan and implement transportation options, such as transit for the purposes of SB 375. For additional discussion on transit funding, please see the Federal Transportation Funding and Supporting Policies Section, page 35.

Local Transportation System Funding

- The city street and county road system is relied upon as the right of way for transit, cycling, pedestrians, etc., yet budget proposals would have eliminated the local portion of the state gas tax or highway user tax account (HUTA) funding. The local HUTA serves as a critical source for the operations and maintenance of

this system. A safe and efficient local transportation network is critical to creating viable, livable communities.

Planning Funding

- In the short term, encourage the Strategic Growth Council to expedite the distribution of Prop 84 funds to assist state and local entities in the planning of sustainable communities. In the long term, provide a stable source of additional funding to fully enable local governments to meet the planning challenges presented by SB 375.
- Provide local authority to impose a surcharge on motor vehicle registration for the purpose of developing a sustainable communities strategy.

Redevelopment Funding

- Address the discontinuity between reduction in redevelopment funds and requirements of SB 375.
- Support infrastructure modernization funding to overcome imbedded disincentives to redevelopment.
- Restore and protect the property tax increment for redevelopment

Affordable Housing Funding

- Provide a permanent funding source for affordable housing. This type of state investment will be essential to achieving the jobs-housing fit necessary to reduce greenhouse gas emissions.

Regulatory Tools

- Provide additional tools for local governments to achieve greenhouse gas reduction targets (i.e. enabling fuel fees, allowing road and congestion pricing).

Other

- Performance data collection, including use of GPS.
- Conduct a statewide housing market survey.

E. Federal Transportation Funding and Supporting Policies

When he signed SB 375 into law, Governor Schwarzenegger signaled California's commitment to improve land use patterns and transportation policies and investments in the name of addressing climate change. While several individual federal legislators have indicated their commitment to this issue, no similar federal legislation has been passed, and the rest of the nation is watching closely as California embarks on implementation of SB 375. Two major pieces of upcoming federal legislation—a climate bill and the re-authorization of the six-year transportation spending bill—present opportunities to advance reform that will both help ensure California is successful in implementing SB 375 *and* encourage improved land use planning to meet climate goals nationwide.

Specifically, the Committee recommends three categories of reform: 1) Climate funding for improved transportation planning; 2) Integration of greenhouse gas emission reduction into the current transportation planning process; and 3) Removing policy barriers and providing incentives to effective SB 375 implementation.

Climate Funding for Transportation Planning

The transportation sector is the second largest (28%) and fastest-growing contributor to greenhouse gas emissions in the U.S., in large part due to steadily rising trends in the number of miles that cars and light trucks travel each year. Despite some recent stagnation attributable to the economy, driving—or vehicle miles traveled rates—has grown by three times the rate of population growth over the past 15 years and is expected to grow by 50% by 2030, largely because the majority of our communities have been designed in ways that give people no other option but to drive everywhere. Since transportation is such a significant contributor of greenhouse gases, policies to improve the efficiency of the transportation system must be a central component of the solution.

The Committee recommends that:

- Some portion of funds generated from the auction of carbon emissions allowances from any future cap and trade system be set aside to fund regional transportation planning that reduces greenhouse gas emissions.
- A portion of this funding should be set aside to improve research, data collection, and tools to measure and evaluate the greenhouse gas impacts of transportation projects and plans. Regions' ability to measure and monitor results is also key to facilitate a move toward performance-based accountability within the program.
- A significant proportion of the funding should be allocated competitively, based on performance, to regions that adopt, and demonstrate progress towards attainment of greenhouse gas emission reduction targets. Because California is leading the charge with implementation of SB 375, MPOs that adopt SCSs will be well positioned to compete for new federal climate funding that is tied to greenhouse gas reduction targets.

Integration of Greenhouse Gas Reduction into Transportation Planning

The next federal transportation bill is likely to be a $500 billion package of investments. A properly designed transportation bill could potentially leverage half of a trillion dollars to dramatically and cost-effectively reduce greenhouse gas emissions. Spent poorly, this funding can serve to undermine efforts to address climate change by continuing business as usual transportation and land use planning resulting in ever increasing rates of driving.

The Committee recommends that:

- The state should request that the transportation bill should establish clear national transportation objectives, consistent with reducing carbon emissions, oil savings and congestion mitigation.

- State and regional long-range transportation blueprint plans should incorporate greenhouse gas reduction goals, with funding tied to implementing projects.
- Local governments play an absolutely vital role in the successful implementation of SB 375 in California. Unfortunately, many local governments are facing severe funding shortfalls, and funding for comprehensive planning is in short supply. The transportation bill should create a new program that sets funding aside for states and MPOs to provide incentive grants to local communities to update zoning and support local projects that achieve regional blueprint goals that contain greenhouse gas control strategies.

Removing Policy Barriers and Providing Incentives to Effective SB 375 Implementation

The Committee members have repeatedly discussed declining state funding available to fund construction and operations of public transportation.

The legacy of the last fifty years of the federal transportation program is the creation of the interstate highway system. Over the life of the program, over 80% of funding has gone to highway programs and roughly 20% to transit. While every metropolitan area in the nation has an extensive highway system, few have a regional fixed-guideway transit network or complete bus network. Federal transit funding cannot be used for local operating assistance, except in communities under 200,000.

Federal transit funds also come with more federal requirements and hurdles than federal highway money including requirements for an additional alternatives analysis for proposed transit projects, a detailed screening process for any new fixed guideway transit, and greater scrutiny of grant programs.

In addition, administrative disincentives to funding public transportation have also created an unlevel playing field between transit and highway expansion – specifically, a lower federal match ratio for transit projects recommended for funding and a complex and cumbersome approval process that adds significant time and delay to proposed transit projects.

Now that the federal interstate highway system is in place investments should turn towards safety and maintenance of existing systems, and the buildout of robust transit networks in major metropolitan areas. Cities and counties no longer receive federal monies directly, but regions should provide incentive programs to support safety and maintenance of city streets and county roads for areas that forward climate change policies.

The Committee urges the state to support reform in the federal legislation to level the playing field between different modes, simplify the process for building new transit, free up some of the proposed $500 billion available over the next six years to support the operations of the state's transit agencies, and provide financial incentives in the form of safety and maintenance funding for jurisdictions that contribute towards GHG emission

reductions by protecting critical resource areas and farmland, or implement strategies to support city-oriented growth.

F. Public Education and Outreach

According to the Scoping Plan, California is the fifteenth largest emitter of greenhouse gases on the planet and transportation accounts for the largest share of California's greenhouse gas emissions. To address this issue, SB 375 seeks to increase access to a variety of mobility options such as transit, biking, and walking, and anti-sprawl land use measures, that include a variety of housing options focused on proximity to jobs, recreation, and services. As a result, quality of life will be improved for everyone, including protection of agricultural land, open space and habitat preservation, improved water quality, positive health effects, the reduction of smog forming pollutants and energy savings. The Committee recommends a robust public outreach and education effort to strengthen and reinforce this effort with the people of California. The goals of this effort could be as follows:

- As it relates to SB 375, public education and outreach activities should have four overarching goals:
- Put forward a positive image of integrated planning for land use, transportation and housing
- Raise awareness of "climate change" legislation (specifically, to explain the changes Assembly Bill 32 and Senate Bill 375 have created)
- Elicit input on the benefits and impacts of the proposed Sustainable Communities Strategies plan for each region
- Increase public awareness of co-benefits of greenhouse gas reduction strategies

Message Development

An effective education and outreach campaign will provide a clear understanding of what it means to integrate land-use, housing and transportation planning in relatable terms, using topics that address established priorities for the public.

Additionally, crafting messages at both the regional and local level will allow for focused outreach and education. For example, regional messages such as: "California Green" or "Climate Prosperity" may be used to embody the global objective of SB 375, however at the local level focusing on 'economic opportunity' and 'quality of life' messages, while capturing the same objectives, may resonate and encourage more participation in those local areas. Ascertaining what messages work regionally and locally is the first step to creating a public outreach and education program.

Education/Outreach Plan

Using the targeted messages, the next step is to draft the education/outreach plan; which addresses how to reach a diverse cross-section of communities and interest groups and what communication methods to use.

Tools/Components

There are many different communication tools available to implement a successful education and outreach campaign. Below is a menu of suggested outreach tools. Of course each region should identify which components will be most effective in their region:

- Collateral Materials- Create brochures, factsheets, briefing papers, newsletters to explain SB 375 principles and develop a plan to strategically distribute them
- Online tools- SB 375 web or micro site, blog, web 2.0 tools, social networking sites, Youtube videos, e-blasts
- Public Meetings- workshops, hearings, summits, town halls, council meeting presentations
- Briefings with Elected Officials/Community Groups
- Media Relations- Earned media: press releases, editorials, letters-to-the-editor, features on local news and radio programs. Paid media: newspaper/radio/TV ads, billboards
- Visualization tools
- Speaker's Bureau- Identify elected officials, opinion leaders and experts to attend meetings and deliver presentations
- K-12 Curriculum- Special materials designed to communicate broad principles in age appropriate formats (For example with younger elementary school age children, create fun games and coloring books)
- College/University Research- Utilize relationships with the academic community to analyze the science and policies involved with climate change and the SCS process
- Awards and Recognitions for ambitious new programs to achieve SCS goals

Target Audience/Stakeholders

Some examples of stakeholders and organizations that should be included in public outreach:

STATE

- Office of the Governor
- Air Resource Board
- Resource Agencies
- Caltrans
- Department of Housing and Community Development
- California Health Department

REGIONAL

- Metropolitan Planning Organizations
- Air & Water Districts
- County Transportation Commissions
- Transit Agencies

- Utilities
- Public Health Advocates
- Private providers of transportation
- Transit Operators
- Non-profit Organizations
- Bicycling Advocates
- Affordable Housing Advocates
- Transportation/Transit advocates
- Universities/Colleges
- Council of Governments
- Conservation Districts

LOCAL/COMMUNITY

- Subregions
- Cities/Counties
- Neighborhood and Community groups
- Homeowner Associations
- Environmental Advocates
- Environmental Justice Advocates
- Building Associations
- Chambers of Commerce
- School Districts
- Interested Parties (e.g. ethnic and minority groups, special interest non-profit agencies, educational institutions, service clubs, and private sector)

PRIVATE & PROFESSIONAL ASSOCIATIONS

- Business Councils
- Real Estate Professionals Organization
- Professional Planning Associations
- Labor Organizations
- Statewide City, County, Community Development and Redevelopment Associations

Substantive change starts with education. The public has to be aware and understand the environmental, economic and cultural benefits of sustainable communities; thinking about what we do today and how it affects our state tomorrow will help promote healthier living and informed decision-making. Educating the public on SB 375 provides an opportunity to emphasize community responsibility for achieving balance between land development, transportation choices and preserving natural resources, for future generations.

G. Flexibility in Designing Strategies

Consistent with SB 375 and the Scoping Plan, the Committee recognizes that flexibility in designing strategies will be important to the State's ultimate success in reducing

greenhouse gas emissions from passenger vehicles and light-duty trucks. As noted on page 48 of the Scoping Plan, “SB 375 maintains regions’ flexibility in the development of sustainable communities strategies…The need for integrated strategies is supported by the current transportation and land use modeling literature.” The Committee strongly recommends that the Board and ARB staff provide the MPOs with the flexibility to incorporate relevant local and regional measures that allow the MPOs to meet the ambitious and achievable targets appropriate to the region’s unique characteristics.

The "bottom up" approach to regional planning that is being promoted through the California Regional Blueprint Planning Program and has been implemented by several MPOs throughout the State has proven to be the model that provides the flexibility that will be important for successful implementation of SB 375. Inherent in this approach is that each of the regions are able to develop strategies that fit the profile of the region in terms of demographics, economic development, market preferences, infrastructure, growth and the built environment. Central to the "bottom up" approach, as well, is the retention of local land-use decision making. It will be critical for the local governments to “buy-in” to the strategies developed to meet the greenhouse gas reduction targets and the collaborative nature of the Blueprint process involves the cities, counties and community to a great extent.

An additional reason for providing flexibility in designing strategies is due to the extended timeframe for changing land use patterns that will help achieve greenhouse gas reductions from urban infill, transit-oriented, and other master-planned community type developments. The first milestone in the timeline will be the setting of the regional targets, followed by the MPOs preparation of the SCS. Each region will then be required to prepare an EIR and adopt their RTP.

Local governments will then decide whether and how to amend their general plan and do the necessary zoning to accommodate the land-use changes in the SCS, which will require their own EIR and adoption process (some cities may have general plans and zoning already consistent with the SCS and may not have to go through this step). The general plan update and zoning changes will allow for a consistent project to be proposed and to begin the project entitlement process. Once the project is approved, it can begin seeking financing for the development costs and then pre-selling the required number of units in order to allow for construction to begin and the project built.

The Committee discussed that even in regions that are able to move efficiently through this process, development projects in response to the SCSs and APSs would be built in about the end of the next decade. If a region were delayed in getting through these steps, the projects would come in beyond 2020. In light of this, regions will need the flexibility to employ a suite of greenhouse gas reduction measures in order to meet the 2020 targets. Nonetheless, land use changes will clearly realize a greater greenhouse gas reduction benefit for the 2035 target and such changes should begin as soon as possible to maximize those future benefits.

H. Co-benefits of Sustainable Communities Strategies

Communities that are well designed and supported by a range of transportation options will significantly reduce greenhouse gas emissions and contribute towards climate change solutions. In addition, many other advantages can result including increased mobility, economic benefits, reduced air and water pollution, and healthier, more equitable and sustainable communities. The Committee recommends that MPOs identify, quantify to the extent possible, and highlight these co-benefits throughout the SB 375 target setting and implementation processes. Co-benefits include the following:

Increased Mobility

- Congestion Relief – Fewer cars on the road results in less congestion, which has a number of benefits and helps to improve quality of life.
- More Transportation Choices – Greater investment in a balanced transportation system and transit-oriented developments can provide increased use of public transportation, and sustainable, healthy transportation options such as walking and bicycle riding.
- Reduced Commute Time and Increased Productivity – Homes closer to job centers can reduce commute time and distance, especially if other modes of transportation are available. People can save time by not sitting in traffic commuting. Public transit provides the opportunity for relaxing or getting work done. Mixed use communities also mean more opportunities to shop and access daily needs near home, saving additional travel time.

Economic Benefits

- Savings – Taking public transit and driving less can save individuals money for fuel costs. Infrastructure/operating costs for transit can also decrease when such costs are spread among an increased number of riders.
- Taxpayer Savings – Services such as maintaining sewer systems, and police and fire services can be more efficient and cost less if they cover more people in less space.
- Neighborhood Economic Development – Increasing density puts more residents within walking distance of neighborhood businesses, providing opportunities for neighborhood economic development.
- Lower up-front infrastructure costs for roads, parking structures, and lower associated environmental impacts.

Reduced Air and Water Pollution

- Less Air Pollution – Reducing the number and length of car and truck trips means less pollution that directly or indirectly creates summertime smog and particulate pollution. Harmful pollution that can cause cancer and other health problems are greatly reduced.
- Improved Water Supply and Quality – Compact development can reduce water use and put less strain on sewer systems. Water quality can also be improved because run off can be filtered by natural lands instead of paved surfaces.

Conservation of Open Space, Farm Land and Forest Land

- The Committee also recognizes there are greenhouse gas benefits inherent in conserving land-based resources including farm and forest land. They play a vital role in California's agricultural economy and maintaining biological health and diversity in the state. These resources also are capable of sequestering carbon in plant and tree matter as well as in soil.
- Urban parks can provide a great opportunity to enhance the aesthetic quality and function of urban neighborhoods. Urban parks, stream corridors, and trails strategically located can encourage non-motorized modes of transportation. When located in urban areas that people can walk or bicycle to, small parks can obviate the need for automobile trips to other parts of the city to satisfy everyday recreational needs.

Healthier, More Equitable and Sustainable Communities

- More Opportunities for Active Lifestyles – Increased walking and bicycle riding can contribute to cardiovascular fitness and weight control, both of which can make people healthier and increase quality of life. Increased physical activity can reduce a number of chronic health risks such as obesity, diabetes, heart disease, cancer and depression.
- Less Dependence on Foreign Oil – Using alternative means of transportation and alternative forms of energy and fuel will reduce our dependence on foreign oil, which can help add to national security and economic stability.
- Improved Safety – Thriving, walkable neighborhoods mean more people on the street, helping to improve safety and discourage unlawful activity.
- Greater Housing Choices – Communities can be designed to include a mix of housing options, which can better meet a growing market demand for a variety of housing types. Recent studies indicate that homebuyers are willing to pay a premium to live in a walkable community.
- Preservation of Farmland, Habitat and Open Space – Dense, mixed-use communities can encourage infill and Brownfield redevelopment, thereby preserving open space, farmland and wildlife habitats.
- More Equitable Communities – Social equity issues can be partially addressed by improving local access and transportation to nutritious foods and health care services that are often out of reach in low income communities and communities of color.

Recommendations on Addressing Co-Benefits in the SCS and in the Target Setting Process

- Make the advancement of co-benefits a key goal in ARB's process for setting regional targets. The target setting process should provide a vision for what can be accomplished in terms of healthier, more active communities, and demonstrate pathways to achieve these goals.
- MPOs should quantify, to the extent possible, the range of co-benefits associated with the achievement of their greenhouse gas reduction targets, as a means of increasing public understanding and support.

- Promote the development and use of planning models that can accurately estimate the potential global warming and co-benefits of various land use scenarios in the development of the targets and the SCS.

I. Performance Monitoring

The Committee recognizes ARB will need to track, over the long-term, the land use and transportation changes resulting from SB 375 implementation to ensure they are helping the state meet its overall greenhouse gas reduction goals. The Committee recommends development of a standard set of real world performance indicators as part of a monitoring system to track regional performance. Additionally, SB 375 requires ARB to update regional targets every eight years or every four years if significant changes to other greenhouse gas reduction measures would affect regional emission levels. These performance indicators will help ARB with these periodic updates of the regional targets. Most importantly, MPOs can use the indicators as a public outreach tool to communicate their progress over time.

The Committee recommends that ARB, in consultation with the MPOs in a public process, identify a list of performance indicators for these purposes. This set of performance indicators should represent the most effective, available means for measuring the impacts of land use, transportation, pricing, transportation demand management/transportation system management, and other MPO plan policies. A variety of indicators are needed to measure different impacts. It is important that the limited number of performance indicators selected for use be easily understood by policy makers and the public, and that the selected indicators rely on readily available and reliable data. The Committee has discussed tracking of both vehicle miles travelled (VMT) and fuel usage data as two important means for verifying greenhouse gas emission reductions from changes in vehicle use. Below are some other examples of policies and associated performance indicators that could be considered:

Policies	Performance Indicators (change from base year to target year)
Statewide	- Percentage increase in funding or number of new programs to increase funding for planning that is consistent with state environmental and housing goals - Percentage increase in funding or number of new programs to increase funding and opportunities for infill infrastructure, including Brownfield remediation and infill infrastructure improvements - Percentage increase in funding or number of new programs to increase funding and opportunities for transportation - Percentage increase in funding or number of new programs to increase funding and opportunities for healthy communities - Percentage increase in funding or number of new programs to improve school quality in infill areas designated for sustainable growth
Land Use	
- Land use distribution - Development density - Land use mix - Urban design/pedestrian environment - Destination accessibility - Affordable housing planning and development Policies could have many descriptions: - Regional transit corridors - Smart growth opportunity areas - Compact development plan - Transit-oriented development	- Average residential densities - Average residential + employment densities - Housing product mix (% of new dwellings -- attached, small lot detached, and large lot detached) - Land use mix (% of new development – infill, redevelopment, Greenfield) - Housing units within X distance of transit with Y service - Changes in housing affordability relative to local wages (jobs/housing fit) - Changes in housing unit to jobs ratio (jobs housing balance)
Transportation	
- Transit network - Road network - Non-motorized transportation network	- Housing units within X distance of transit with Y service - Average cost of transit fares - Number of lane miles - Centerline miles per square mile (to analyze walkable street patterns) - % of non-highway roads with sidewalks - % of non-highway roads with bike lanes - Funding priorities (% of funding for new capacity projects, for transit projects, for road maintenance, for transit operations, for non-motorized transportation, other) - Mode split (% trips auto, transit, bike, walk) - Speed-related impacts (% of VMT at different speeds)
Pricing	
- Parking pricing - Road pricing (congestion pricing, HOT lanes, tolls/toll roads - VMT pricing	- Daily cost of driving - Speed-related impacts (% of VMT at different speeds)

TDM/TSM	
Strategies to reduce trips/VMT and to smooth extreme congestion to more carbon-friendly speeds. Includes: - Telecommuting - Incentives for ridesharing and transit - Parking management - Vanpooling - Compressed work schedules - Safe routes to schools programs - Intelligent transportation systems - Incident management systems	These are often finite programs that often must be evaluated separately. Impacts are difficult to estimate. After-the-fact empirical data must be compiled. Such as: - For employer-based trip/VMT programs: employer participation levels accompanied by employee commute surveys. - For school-based programs: school participation levels accompanied by student/family trip surveys. - For TSM programs: Speeds and congestion incidents monitored before and after TSM programs.

J. Model Enhancements

The Committee spent an extensive amount of time discussing model capabilities and improvements. This section includes additional Committee recommendations for model improvements that go beyond those discussed in the "Use of Modeling" section.

- In addition to regional model improvements, the Committee recognizes the critical role of state leadership in a statewide model and research effort. Caltrans provided the Committee with an update on their ongoing work to develop a statewide modeling framework that includes an enhanced 2010 Statewide Household Travel Survey, a statewide model focused on interregional trips and goods movement, as well as a long-term goal of developing an integrated econometric land use and transportation model. Included in the Committee's support of this statewide effort, is the recommendation that the state establish a statewide cooperative research program to enable the pooling of resources for model development and staff training.
- The Committee supports the development of, and improvements to, modeling tools that go beyond traditional transportation demand models. Such tools can include activity-based, integrated land use, and economic models.
- The Committee recommends the incorporation of housing affordability and social equity factors into regional and statewide model improvement efforts. We encourage the state to identify and pursue the necessary research efforts and model development efforts that would support the development of this capability.
- The Committee also supports the research and development of models that can estimate the greenhouse gas reductions from such things as energy efficiency improvements that result from the various land use and transportation strategies considered throughout the implementation of SB 375.
- The Committee also supports the development of a program to gather regional fuel purchase data and annual VMT data (e.g. odometer readings during vehicle registration).

IV. Follow-Up RTAC Meeting

The Committee plans to hold a future public meeting to review MPO scenario data, as it becomes available, to provide an opportunity for the members to evaluate the results of the scenario analyses for the target setting process.

APPENDIX A

MPO SELF-ASSESSMENT OF CURRENT MODELING CAPACITY AND DATA COLLECTION PROGRAMS

Background

At its February meeting, the RTAC requested information on modeling capabilities and data collection programs currently in use by MPOs around the state. An assessment form was developed and reviewed at the February RTAC Staff Working Group meeting, and subsequently sent out to modeling staff at each MPO. The assessment focused on two general concerns expressed at the SWG meeting:

1) Are models reasonably sensitive to key factors and policy variables which are potentially of great interest for target-setting or implementation of SB375?

2) Are models comparable in their capabilities across the state? That is, do they provide a "level playing field" for evaluations of land use or transportation policies or factors of interest for target setting or implementation of SB375?

A preliminary version of the assessment was presented at the March RTAC meeting. A limitation of self assessment of complicated modeling systems and data collection programs, which for all sorts of historical, financial, practical, and policy reasons vary widely from MPO to MPO, is that it is difficult to "normalize" the assessment—i.e. ensure that all the respondents assessed themselves using the same definitions and standards. The RTAC commented on this at the March meeting, and an attempt was made to normalize the assessments for modeling capacities by adopting a consistent definition of "reasonable sensitivity".

Reasonable Sensitivity of a Model

For purposes of the assessment of travel demand models and land use models and projections currently in use by MPOs in California, the following definition of "reasonable sensitivity" was used:

"Reasonable sensitivity of a model to a key factor means that variations in the key factor which are used as inputs to or parameters within the model result in variations in model output measures which:

a) fall within the range of observed variation reported in research literature, academic consensus, or peer consensus;

b) match variations in observed travel or land use data within tolerances established for modeling by the MPO and those in published model validation guidelines by state and federal organizations (e.g. FTA New Starts, CTC Guidelines, etc); or

c) would be expected based on travel behavior or land economics theory, if a range of observed variation is not known, or no consensus exists as to the acceptable range of observed variation."

<u>Assessment Categories for Models</u>

The assessment scheme is based on the judgment of the MPO staff as to the applicability or sensitivity of the model to various "key factors" which are known to influence either travel behavior, or the location or quantity of land uses within a region. The assessment scheme for both travel demand models and land use models includes five categories, as follows:

a) *"Factor Not Applicable in Region" such as the ability to model transit in an area with no transit service, or extremely low transit ridership, nor significant plans for any future transit services;*

b) *"No Capacity to Model Factor" indicates that the factor is or will be relevant, but the model has no ability to account for it in forecasting land use or travel behavior.*

c) *"Sensitivity Unknown/Untested" indicates that the factor is accounted for in the model, but has not be rigorously tested, and the model sensitivity is unknown.*

d) *"Limited Sensitivity to Factor" indicates that the model accounts for the factor, but that testing or experience has revealed that the sensitivity of the model to the factor is less than expected based on research or published guidance.*

e) *"Reasonably Sensitive to Factor" indicates that the model sensitivity has been tested, and it falls within expected ranges based on research or published guidance.*

Land Use or Transportation Data Collection and Monitoring Programs

For purposes of this assessment, the following definition of data collection and monitoring program was used:

"A transportation or land use data collection program is an organized effort to directly collect observations of any of the following phenomena: land uses; dwelling units or households; jobs; school enrollments; special or unique land uses of significant size (airports, hospitals, etc.); population and population demographics; transportation facilities and services; or utilization of transportation facilities and services.

A monitoring program is an agency effort to assemble and integrate data from one or more sources, and organize the data in a form useful for describing and quantifying change or variation in observed phenomena. The changes could be changes over time for a known geography (i.e. trends, growth, etc.); differences over space for the same time (e.g. a comprehensive database inventory of dwelling units for a known area, broken down by relatively small geographic units); or variation of demographics for a single point in time (e.g. cross tabulation of numbers of trips by number of persons in a household).

For data collection or monitoring program to be 'adequate to meet expected needs', it must be:

a) *Reliably collected (i.e. collected for known time periods and geographies, and using appropriate and known collection methods);*

b) *Comprehensively collected, assembled or integrated (i.e. either the collected data, or the data when integrated with other sources, is complete to some known geography or time period for the observed phenomena);*

c) *If used for identifying trends, the data (as collected or as integrated with other sources) from one time period are consistent with and comparable to data collected from another time period; and*

d) *Level-of-effort scaled appropriately to the policy questions being asked (i.e. if year-over-year changes in transit ridership are sought, data collection methods must be robust enough to capture relatively small changes)."*

By this definition, there exist several data collection efforts undertaken by non-MPO agencies which may be considered a monitoring program by an MPO which assembles, integrates, and uses the collected data. Two examples:

Example 1: The Highway Performance Monitoring System is the most often cited source for area-wide estimates of vehicle miles traveled, as well as many other characteristics of transportation system supply and utilization. The State has been delegated by FHWA the task of organizing data collected primarily by local agencies for purposes of developing area-wide estimates of VMT. The direct data collection, then, is performed by local agencies. The State integrates the raw data, expands the sample to specific jurisdictional geographies, and tabulates these estimates. Many MPOs track VMT data for their jurisdiction as reported in HPMS, and use those estimates for many purposes, including validation of travel demand models, development of VMT trendlines for their jurisdiction, etc. All of these MPO activities which apply HPMS VMT estimates to their jurisdiction constitute a monitoring program, though based entirely on data collected local agencies and integrated by the State.

Example 2: The State conducts decennial household travel surveys throughout California. For many MPOs, these are the only household travel surveys conducted in their jurisdiction, and the State survey data are used for many MPO functions, such as development, calibration, and validation of travel demand models, and establishment of base year external travel demands. Again, no direct data collection is done by the MPO, but the process of extracting records of households within the MPO jurisdiction, tabulating the survey data, and performing descriptive statistical analysis on travel behavior of those households for use in travel demand modeling, constitutes a monitoring program.

<u>Assessment Categories for Data Collection or Monitoring Programs</u>

A five-category assessment scheme was also used for data/monitoring programs, but with different assessments levels than used for models:

a) *"Data Item Not Relevant to Region" is analogous to the "Factor Not Applicable in Region" for the model assessments—its used for data collection of phenomena which do not occur in a particular region, or are not important for land use and transportation planning decisions.*

b) *"Data Item Relevant, but Not Monitored" indicates a data item which has some importance to land use or transportation policy discussions or debates in a region, but for which no program exists to collect, assemble, or integrate data.*

c) *"Current Monitoring Inconsistent—No Plans for Improvement" indicates that the data item is relevant, and data are collected to some extent—however, the data collection is not robust or consistent enough to meet expected needs.*

d) *"Current Monitoring Non-Existent/Inconsistent—Improvement Planned" indicates that data collection currently is not done, or is done inconsistently, but some plan exists (with or without funding) which would improve the data collection and monitoring to be adequate to expected needs.*

e) *"Current Monitoring Adequate for Expected Needs" indicates that the data collection and monitoring programs in place are sufficient to support current and expected policy discussions and planning efforts.*

Statewide Travel Demand Models and Data Collection or Monitoring Programs

Questions were also raised at the March RTAC regarding the status of the Statewide travel demand models in this assessment. After conversations with Caltrans staff in the Transportation Systems Information branch, and with other MPO staff, it was decided that the Statewide travel demand models were so much different in their function and purpose than MPO models, that many of the key factors included in the assessment did not relate to the Statewide model. Additionally, the Statewide travel demand models' purposes were intended to focus on some of the exact travel behaviors which the MPO models cannot capture: 1) very long distance, interregional, interstate, and international travel; and 2) other, shorter distance travel which happens to cross one or more MPO jurisdiction boundaries. In fact, instead of representing a new "row" in the assessment tables presented below, the Statewide travel demand model is intended to capture several of the columns in the assessment, especially those related to "external" travel by MPO modeling definitions (i.e. interregional, interstate, and international travel). It is acknowledged by many involved in this assessment that the Statewide travel demand model should be the subject of an assessment of its sensitivity to key factors, but that assessment should be done independent of this one. The key factors in the MPO model assessment tables which are relevant to or dependent on the Statewide travel demand model or State data collection programs are highlighted and annotated in the tables below.

MPO TRAVEL DEMAND MODELS

Sensitivity to Policy Variables and Factors

Figure 1a focuses on policy variables which significantly influence travel in a region, and over which local agencies and system operators have some level of control. Policy variables for which MPOs assessed their travel models were:

- *Macro-level land use characteristics* refer to land uses across relatively large spatial areas, such as traffic analysis zones (TAZ's):
    - Land use distribution is the spatial distribution of households, population, jobs, and other variables, across TAZ's or other relatively large areas in the region.
    - Land use mix is the mix and balance of uses across traffic analysis zones in the region. This geographic level of mix accounts for regional or longer-trip factors like jobs/housing balance, as well as some sub-regional or shorter-trip factors like appropriate balance of school-age children (on the household or population side) and school enrollment capacity (on the school side), or the appropriate balance of households or population and retail opportunities (measured by retail jobs, for example).

- *Micro-level land use characteristics* refer to land uses across relatively small spatial areas (e.g. parcels or small grid-cells):
    - Density is the density profile of land uses in smaller areas, such as neighborhoods or clusters of parcels. Clustering of households or population around high-quality transit stations or stops is one example of micro-level density—in many cases, larger, macro-scale geographic units like traffic analysis zones are too large to capture micro-level clustering and density.
    - Mix of use includes the balance of uses within smaller geographic areas, such as neighborhoods or clusters of parcels. An example of this sort of mix is the balancing of restaurant/food service or other services within a small employment center. This type of smaller scale mix of use facilitates the use of non-motorized modes by workers for shorter trips during the course of a work day—e.g. walking to a restaurant for lunch rather than driving, or doing an errand like dry cleaning on foot during the course of a workday, rather than by driving to a dry cleaner traveling between home and work.
    - Pedestrian environment variables include characteristics of smaller geographic areas (e.g. street pattern or presence/absence of pedestrian amenities such as walking paths or sidewalks) which encourage the use of non-motorized modes for shorter trips.

- *Three sorts of highway improvements* were included:
    - Basic roadway capacity expansion projects (e.g. new roadways or adding of lanes to existing roadways)
    - Addition of HOV lane or other exclusive use roadway facilities
    - Implementation of traffic operations improvements which don't include full-lane capacity expansion, such as auxiliary lanes, traffic signal coordination, or geometric improvements at intersections or junctions which improve traffic flow.

- *Four sorts of transit service improvements* were included:
    - Addition of new transit lines (e.g. a new bus or rail line)
    - Increasing transit service frequency on existing transit lines
    - Upgrading services (e.g. implementing bus rapid transit on a corridor served by conventional bus, or replacing commuter bus routes with rail)
    - Implementing inter-regional transit services, such as longer inter-city rail lines
    - Improvements to access to or from transit stations or stops and passenger trip origins or destinations (e.g. the journey from home to the first transit station or stop, or the journey from the last transit station or stop to a workplace) in order to increase transit ridership

- *Five sort of pricing improvements* were included:
    - Development of toll roads, or addition of tolls or congestion pricing to existing road corridors
    - HOT lanes, which allow non-qualifying vehicles to "buy in" to exclusive facilities such as HOF lanes
    - Policies aimed at increasing or decreasing the cost of parking to achieve particular goals
    - Policies which implement pricing based on overall utilization of roadways, such as VMT fees
    - Policies which increase or decrease the transit fares for different types of passengers to achieve particular goals

- *Transportation demand management (TDM)* policies were unspecified in the assessment, but should include a range of non-capacity or non-pricing policies not mentioned elsewhere: promotion of carpooling, vanpooling, or substitutes for travel (e.g. teleconferencing, telecommuting); promotion of non-motorized travel alternatives (e.g. walking or biking) at workplaces, schools, etc.; and other policies or programs (see Figure 1c). It was noted by SANDAG staff that TDM policies are particularly ambiguous and complex, and the actual definitions used by MPOs in the assessments may not be fully consistent.

- *Goods movement or freight policies* which seek to: improve the efficiency or competitiveness of a region, corridor, or sub-region in terms of movement of goods to, from, or through it; reduce the impact of goods movement or freight on other travelers or residents; or improve the attractiveness of selected roadways for goods movement or freight to achieve some other policy goals, such as reduction of congestion, improvement of safety, etc. (see Figure 1c).

- *Policies related to access to or from an airport* and non-airport trip origins or destinations within the region, such as addition of new transit or shuttle services, streamlining of passenger parking on or off the airport, etc. Policies could address passenger, employee, or freight ground access (see Figure 1c).

<u>General Observations on Sensitivity to Policy Variables:</u>

- Virtually all MPOs reported having models reasonably sensitive to macro-level land use or demographic variables; very few reported reasonable sensitivity to micro-level variables. Given that most MPOs rely on traffic analysis zones as the smallest geographic unit of analysis, this split is not surprising—sensitivity to micro-level land use characteristics requires land use data below traffic analysis zone level.

- Larger MPOs reported having models with reasonable sensitivity to a wider range of policy variables, as well as more plans for model improvements and active development work, than did smaller MPOs.

- Smaller MPOs reported having simpler models, without sensitivity to many policy variables. Very few smaller MPOs have models capable of modeling transit.

- For several policies/key factors, most MPOs reported their models had no capacity, untested capacity, or insensitivity to the factor:
    - ITS and traffic management
    - Intercity transit
    - Pricing policies, especially those for toll roads and HOT lanes

- Only four MPOs (SANDAG, SCAG, STAN COG, and SBCAG) reported the capacity to model TDM strategies.

- Only two MPOs (SANDAG and SCAG) reported some level of capacity to model an array of goods movement policies, such as development of freight corridors, port access and freight facility improvements, truck lanes, and operational improvements focused on goods movement.

- Only three MPOs (SANDAG, SCAG, SACOG) reported some level of sensitivity to transit accessibility.

Sensitivity to Exogenous Factors

Figure 1b focuses on variables which are not directly controlled by local agencies and system operators, but which nonetheless significantly influence travel in a region. Exogenous factors included in the assessment were:

- *Fuel prices* or *auto operating costs.* Auto operating costs generally include the overall variable or out-of-pocket cost of operating a private automobile, including cost of fuel (and vehicle fuel efficiency), cost of maintenance, and cost of tires. Generally, auto operating costs exclude more fixed cost factors, such as purchase price of the automobile, financing costs, insurance, depreciation, etc.

- *Key demographic variables*, such as:
    - Age
    - Income
    - Household size
    - Person type
    - Other factors (household composition, etc.)

- *Characteristics of the vehicle fleet* in a region. EMFAC and other emissions estimation tools account explicitly for vehicle type, but the characteristics of the fleet are attached to the travel model forecasts of motor vehicle activities *post-hoc*. That is, the characteristics of the fleet are generally not directly represented in travel models.

- *External travel*, which for MPO regional travel demand models, includes three components: internal-to-external ("I-X") travel; external-to-internal ("X-I") travel; and through ("X-X") trips. Because these three types have at most one trip end within the MPO region, and the other trip end or both trip ends (for X-X trips) outside the region, and MPO models generally do not truly model travel activities outside their subject MPO region, these travel demands are generally treated as exogenous variables and directly set by the modeler based on an off-model data set or analysis. External travel includes at least two major sub-markets:
    - Household-generated travel (commute, shop, recreational, social, school trips by residents of a region or those residents immediately outside the region
    - Goods movement or freight, much of which is external due to the long length of many freight trips.
        - Special note on external goods movement or freight: the overall level of demand for goods movement or freight travel to or from points outside the region, plus freight traveling through a region, is generally treated as an exogenous variable; policies related to accommodating external freight travel, along with internally-generated freight travel, are listed as policy variables in the above section.

<u>General Observations on Sensitivity to Exogenous Variables:</u>

- Reports of model capabilities mirror those for travel modeling for policy variables:
    - Larger MPOs reported having models which capture more factors, and had more planned or ongoing improvements
    - Smaller MPOs reported having models which capture fewer factors, with fewer planned improvements.

- Accounting for characteristics of vehicle fleets (i.e. what sort of vehicles travelers use, in aggregate) or vehicle type was not reported as being accounted for within any travel model.

- Very few MPOs reported any capacity or known sensitivity to external travel, whether it be trucks or household-based trip purposes. External travel is set directly based on off-model data or analysis.

- Only the largest four MPOs (SCAG, MTC/ABAG, SANDAG, SACOG) reported reasonable sensitivity to fuel prices or auto operating costs.

- Only six or seven of the eighteen MPOs reported reasonable sensitivity to age or income, demographic variables known to significantly influence travel behavior.

Key for All Assessments of Travel Models:

KEY	Policy Not Applicable in Region	No Capacity to Model Factor	Sensitivity Unknown/ Untested	Limited Sensitivity to Factor	Reasonable Sensitivity to Factor
No Planned Improvement	○	🔴	⚫	🟡	🟢
Improvement Planned	○	🔴	⚫	🟡	🟢
Improvement Under Development	○	🔴	⚫	🟡	🟢

Figure 1a.
SENSITIVITY OF TRAVEL DEMAND MODELS TO POLICY VARIABLES OR FACTORS

MPO (Listed by Population in Descending Order)	MACRO LAND USES		MICRO LEVEL LAND USES (e.g. the "Ds")			ROAD PROJECTS			TRANSIT PROJECTS				PRICING				
	Distribution	Mix	Density	Mix	Pedestrian Environment	Gen'l Purpose	HOV	ITS / Traffic Management	New Lines	Increase Service	Upgrade (e.g. bus > LRT)	Interregional Transit	Tolls/Toll Roads	HOT Lanes	Parking	VMT	Transit Fares
SCAG	🟢	🟢	⚫	⚫	⚫	🟢	🟢	⚫	🟢	🟢	🟢	🟢	🟡	🟡	🟡	🟢	🟢
MTC/ABAG	🟢	🟢	🟡	🟡	🟡	🟢	🟢	⚫	🟢	🟢	🟢	🟡	🟡/🟢	🟡/🟢	🟢	🟢	🟢
SANDAG	🟢	🟢	⚫	⚫	⚫	🟢	🟢	⚫	🟢	🟡	🟢	🔴	🟢	🟡	🟢	🟢	🟢
SACOG	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢	🔴	🔴	🔴	🔴	⚫	🟢	🟢
FRESNO COG	🟢	🟢	🟡	🟢	🟡	🟢	⚫	⚫	🟢	🟢	⚫	🔴	🔴	🔴	⚫	🔴	🟢
KERN COG	🟢	🟢	🟡	🟡	🟢	🟢	⚫	⚫	🟢	🟢	🟢	🔴	🔴	⚫	🟢	🔴	⚫
AMBAG	🟢	⚫	🔴	🔴	🔴	🟢	⚫	🔴	⚫	⚫	⚫	⚫	🔴	🔴	🔴	🔴	⚫
SJ COG	🟢	🟢	🔴	🔴	🔴	🟢	○	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
STAN COG	🟢	🟢	🟢	🟢	🔴	🟢	🔴	🟡	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
TULARE CAG	🟢	🟢	🟢	🟢	🔴	🟢	○	⚫	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
SBCAG	🟢	🟢	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🔴	🔴	🔴	🟢
SLO COG	🟢	🟢	⚫	⚫	⚫	🟢	○	🔴	🔴	🔴	○	🔴	○	○	🔴	🔴	🔴
MERCED CAG	🟢	🟢	🔴	🔴	🔴	🟢	⚫	⚫	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
BUTTE CAG	🟢	🟢	🔴	🔴	🔴	🟢	○	🔴	🔴	🔴	🔴	🔴	○	○	🔴	🔴	🔴
SHASTA CO. RTPA	🟢	🟢	🟡	🟢	🟡	🟢	⚫	⚫	🟢	🟢	🔴	🔴	🔴	🔴	⚫	🔴	🟢
KING CAG	🟢	🟢	🟡	🟢	🔴	🟢	○	○	🔴	🔴	🔴	🔴	○	○	○	○	○
MADERA CTC	🟢	⚫	🔴	🔴	🔴	🟢	○	○	🔴	🔴	🔴	🔴	○	○	🔴	🔴	🔴
TAHOE MPO																	

Source: Sacramento Area Council of Governments, May 2009. Based on assessments provided by each MPO.

Note: Bounded in blue is a factor (interregional transit) which MPO models are not capable of forecasting, simply because the scope of the travel is outside the model areas. This is why so many MPO models were assessed as "no capacity" (red ball) for this factor. This factor is currently modeled only by the Statewide Travel Model (or its adaptation for the High Speed Rail Study). Because of its unique function, the Statewide Travel Model should be assessed separately, with a focus on its capabilities to provide credible estimates and forecasts of interregional travel by transit modes, such as the Capitol Corridor, San Joaquin, Pacific Surfliner, and Altamont Commuter Express services, plus other longer distance rail or bus services. In addition, discussions between the State and MPO's regarding how the Statewide Travel Model should be used in a consistent way across the state should take place in the context of the CTC Modeling Guidelines update (starting Summer 2009).

Figure 1b.
SENSITIVITY OF TRAVEL DEMAND MODELS TO EXOGENOUS FACTORS

MPO (Listed by Population in Descending Order)	Gas Prices	Auto Operating Cost	Age	Income	Vehicle Fleet	External Travel—Trucks / Freight	External Travel—Household-Based
SCAG	🟢	🟢	🟢	🟢	○	🟡🟢	🟡🟢
MTC/ABAG	🟢	🟢	🟢	🟢	🔴	🟢	🟢
SANDAG	🟢	🟢	🟡🟢	🟢	🔴	🟢	🟢
SACOG	🟡🟢	🟡🟢	⚫	🟢	🔴	⚫	⚫
FRESNO COG	⚫	⚫	🔴	⚫	🔴	⚫	⚫
KERN COG	🔴	🔴	🔴	⚫	⚫	⚫	⚫
AMBAG	🔴	🔴	🟢	🟢	🔴	⚫	⚫
SJ COG	🔴	🔴	🔴	🔴	🔴	🔴	🟢
STAN COG	🔴	🔴	🔴	🟢	🔴	🔴	🟢
TULARE CAG	🔴	🔴	🔴	🔴	🔴	⚫	⚫
SBCAG	🔴	🔴	🟢	🟢	🔴	🔴	🟢
SLO COG	🔴	🔴	🔴	🔴	🔴	⚫	⚫
MERCED CAG	🔴	🔴	🔴	🔴	🔴	🔴	🔴
BUTTE CAG	🔴	🔴	🔴	🔴	🔴	⚫	⚫
SHASTA CO. RTPA	⚫	⚫	⚫	⚫	🔴	⚫	⚫
KING CAG	🔴	🔴	🔴	🔴	🔴	🔴	⚫
MADERA CTC	🔴	🔴	🔴	🔴	🔴	🔴	⚫
TAHOE MPO							

Source: Sacramento Area Council of Governments, May 2009. Based on assessments provided by each MPO.

Note:

Bounded in blue are two factors for which the Statewide Travel Models were frequently (though not universally) reported as being a primary source for forecasts by MPOs.

The "unknown sensitivity" (grey ball) or "no capacity" (red ball) reported for these factors by MPOs related in some cases to reliance on the Statewide Travel demand model, which is treated as an exogenous model input.

The Statewide Travel Model (for household-based travel) and the Statewide Freight Model (for goods movement and freight) are fundamentally different tools than MPO models, in that their focus is longer interregional, interstate, and international travel, and they include factors which are NOT directly modeled by most MPOs.

Because of these differences compared to MPO models, they should be assessed separately, with a focus on their capabilities to provide credible estimates and forecasts of interregional and long-distance travel. In addition, discussions between the State and MPOs regarding how the Statewide Travel Models should be used in a consistent way across the state should take place in the context of the CTC Modeling Guidelines update (starting Summer 2009).

Figure 1c.
SENSITIVITY OF TRAVEL DEMAND MODELS TO OTHER FACTORS

MPO (Listed by Population in Descending Order)	TDM Strategies	Goods Movement (e.g. freight corridors, truck lanes. etc.	Aviation / Airport Ground Access	Other Demographics (e.g. household composition, etc.)	Transit Accessibility
SCAG					
MTC/ABAG					
SANDAG					
SACOG					
FRESNO COG					
KERN COG					
AMBAG					
SJ COG					
STAN COG					
TULARE CAG					
SBCAG					
SLO COG					
MERCED CAG					
BUTTE CAG					
SHASTA CO. RTPA					
KING CAG					
MADERA CTC					
TAHOE MPO					

Source: Sacramento Area Council of Governments, May 2009. Based on assessments provided by each MPO.

MPO LAND USE MODELS

Land use models are used to forecast or project future land use quantities and spatial distributions within a region. The simplest models allocate future growth to areas based on available capacity and forecaster judgment. The most advanced models are based on analysis of economic activities within a region, and include feedback to travel demand models.

Key factors for which MPOs assessed their land use models were:

- *Land use policies*, such as: current zoning and general plan land use designations; ongoing or anticipated amendments to zoning or general plan; studies related to jurisdiction boundaries changes, annexations, and changes to spheres-of-influence; or other anticipated changes to land use policies.

- *Economic factors*, such as: cost and affordability of housing; land costs; and the overall level of regional economic activity and production.

- *Other factors*, such as: historic growth rates and patterns; of State-sanctioned projections of population, which many MPOs use as control totals in their land use forecasting processes.

<u>General Observations:</u>

- The only factors which virtually all MPOs reported reasonable sensitivity to was current land use policies (zoning and general plans), State-sanctioned control totals, and, to a lesser extent, proposed/anticipated changes in zoning or general plans.

- For all other factors, most MPOs reported unknown sensitivity or no capacity.

- As with travel models, larger MPOs reported having land use models with reasonable sensitivity to key factors, as well as more plans for model improvements than do smaller MPOs.

- Very few MPOs have land use models with known sensitivity or capacity to capture key economic factors like housing affordability, factors which influence land development (e.g. land costs, returns-on-investment, etc.) or basic economic production within the region.
    - The three largest MPOs (SCAG, SANDAG and SACOG) reported active development of an integrated land use/transport model which is intended to capture many economic factors.
    - Four other MPOs (MTC/ABAG, SBCAG, SLO COG, BUTTE CAG) reported plans to enhance land use modeling capabilities to capture economic factors.

KEY	Policy Not Applicable in Region	No Capacity to Model Factor	Sensitivity Unknown/ Untested	Limited Sensitivity to Factor	Reasonable Sensitivity to Factor
No Planned Improvement	○	🔴	⚫	🟡	🟢
Improvement Planned	○	🔴	⚫	🟡	🟢
Improvement Under Development	○	🔴	⚫	🟡	🟢

Figure 2.
LAND USE MODEL SENSITIVITY TO KEY FACTORS INFLUENCING FUTURE LAND USES

	LAND USE POLICY			ECONOMIC FACTORS			OTHER	
MPO (Listed by Population in Descending Order)	Current Zoning / Gen'l Plans	Planned Changes to Z/GP (E.g. SOI)	Other Land Use Policy Changes	Resid. Location (e.g. Affordability)	Development-Related (e.g. ROI, land cost, etc)	Regional Production	Historic Growth Trends	State-Sanctioned Control Totals
SCAG	🟢	🟢	🟢	🔴	🔴	🔴	🟢	🟢
MTC/ABAG	🟢	🔴	⚫	🟢	🔴	🔴	🔴	🔴
SANDAG	🟢	🟢	🟢	🔴	🔴	🟢	🟢	○
SACOG	🟢	🟢	🟢	⚫	⚫	🔴	🟢	🟢
FRESNO COG	🟢	⚫	⚫	⚫	⚫	🟡	🟢	🟢
KERN COG	🟢	🟢	⚫	⚫	🔴	⚫	🟡	🟢
AMBAG	🟢	🟢	🟢	🔴	🔴	🔴	🔴	🟢
SJ COG	🟢	🔴	⚫	🔴	🔴	🔴	🟢	🔴
STAN COG	🟢	🟢	🟡	🟢	⚫	🟡	🟡	🟡
TULARE CAG	🟢	⚫	⚫	⚫	⚫	⚫	🟢	🟢
SBCAG	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
SLO COG	🟢	🟢	🟢	⚫	🔴	🔴	🟢	🟢
MERCED CAG	⚫	⚫	⚫	🔴	🔴	🔴	🟢	🟢
BUTTE CAG	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
SHASTA CO. RTPA	🟢	⚫	⚫	⚫	⚫	⚫	🟢	🟢
KING CAG	🟢	⚫	⚫	⚫	⚫	🔴	🟢	🟢
MADERA CTC	🟢	⚫	⚫	🔴	🔴	🔴	🟢	🟢
TAHOE MPO								

Source: Sacramento Area Council of Governments, May 2009. Based on assessments provided by each MPO.

MPO DATA COLLECTION / MONITORING PROGRAMS

A transportation or land use data collection program is an organized effort to directly collect observations of any of the following phenomena: land uses; dwelling units or households; jobs; school enrollments; special or unique land uses of significant size (airports, hospitals, etc.); population and population demographics; transportation facilities and services; or utilization of transportation facilities and services.

A monitoring program is an agency effort to assemble and integrate data from one or more sources, and organize the data in a form useful for describing and quantifying change or variation in observed phenomena. The changes could be changes over time for a known geography (i.e. trends, growth, etc.); differences over space for the same time (e.g. a comprehensive database inventory of dwelling units for a known area, broken down by relatively small geographic units); or variations over demographics for a single point in time (e.g. cross tabulation of numbers of trips by number of persons in a household).

For data collection or monitoring program to be 'adequate to meet expected needs', it must be:

- *Reliably collected* (i.e. collected for known time periods and geographies, and using appropriate and known collection methods);
- *Comprehensively collected, assembled or integrated* (i.e. either the collected data, or the data when integrated with other sources, is complete to some known geography or time period for the observed phenomena);
- *Consistently collected*--If used for identifying trends, the data (as collected or as integrated with other sources) from one time period are consistent with and comparable to data collected from another time period; and
- *Appropriate to the policy questions being asked* (i.e. if year-over-year changes in transit ridership are sought, data collection methods must be robust enough to capture relatively small changes).

Four general categories of data collection / monitoring programs were included in the assessment (Figures 3a and 3b):

- Land use
  - Housing (e.g. dwelling units, households, residentially-zoned lands, etc.)
  - Jobs or employment (e.g. the number of jobs by sector)
  - Schools (e.g. K-12 schools, colleges and universities, etc.)
- Demographics—Key demographic data on populations within the MPO using the decennial Census, American Community Survey, California Department of Finance, or other sources. Other population demographic data includes fertility and migration statistics.
- Transportation system utilization
  - Highway Performance Monitoring System data, especially vehicle miles traveled.
  - Other VMT data sources (e.g. household travel surveys, periodic odometer readings, etc.)
  - Traffic counts—counts of vehicles (in total or by vehicle type) in known locations and for known dates and time periods.
  - Transit boardings—counts of passenger boardings (or alightings) for an operator in total, or broken down by service type or line.
  - Travel surveys of different types, all of which survey travelers for purposes of characterizing traveler demographics, travel purposes, or times and distributions of travel. These surveys are most often used for developing submodels within a regional travel demand model (e.g. a mode choice submodel, or destination choice submodel).
    - Household travel surveys, which seek to survey a cross-section of a region's residents about travel by all members of the household for all purposes
    - On-board transit surveys—surveys of transit passengers.
    - External travel surveys—surveys of travelers going in or out of a region.
    - Airport ground access surveys—surveys of airport passengers.
- Transportation system supply
  - Roadway supply data includes alignments, functional class, number of lanes, speed limits or prevailing speeds, slope, and other characteristics of the roadway.
  - Transit service supply data includes alignments, station or stop locations, service frequencies by different time periods, fares, restrictions on use, etc.
  - Pedestrian and bike facilities data include alignments, types of facilities (i.e. pedestrian/bike bridge, Class I bike lane, etc.), including presence or absence of sidewalks on roadways.

<u>General Observations:</u>

- Most common assessment reported of all data collection and monitoring programs was "inconsistent…"--that is, data are collected but not on a regular schedule or in a consistent way.
  - For housing and employment monitoring, two of the most fundamental inputs to travel and land use models—only one MPO gave themselves an "adequate" assessment.
  - For VMT, only seven of eighteen MPOs assessed their monitoring programs as adequate, and no MPO had any plans for improvement. FYI, the major reason for the poor assessments was that the only source of region-level VMT data is HPMS, which was viewed by most MPOs as a source of unknown quality, and over which the MPO had very little influence or control.
- Decennial census and household travel surveys (normally about every 10 years) were the most often reported as "adequate".
- The American Community Survey (ACS) was reported by several MPOs as "not monitored" because the complete geography, 5-year rolling average sample datasets have not yet been released. Most MPOs indicated that monitoring of ACS would ramp up as the data on the smaller geography areas is released, starting in 2010.
- Only two MPOs (SANDAG, SBCAG) reported monitoring of external travel as anything but "not monitored". Difficulty and cost of doing external travel surveys, plus lack of available funding, were cited as the most common reasons for NOT doing external surveys. Also, many MPOs rely on the Statewide travel survey for data on external travel.
- For transportation supply, monitoring or roadways was generally assessed as adequate; monitoring of transit services and pedestrian or bicycle facilities was often not monitored by smaller MPOs.

Key for Data Collection/Monitoring Program Figures:

KEY	Data Item Not Relevant to Region	Data Item Relevant, but not Monitored	Current Monitoring Inconsistent—No Plans for Improvement	Current Monitoring Inconsistent—Improvement Planned	Current Monitoring Adequate for Expected Needs
No Planned Improvement	○	●	●	●	●

Figure 3a.
MPO DATA COLLECTION / MONITORING PROGRAM ASSESSMENT SUMMARY

MPO (Listed by Population in Descending Order)	LAND USE				DEMO-GRAPHICS		SYSTEM UTILIZATION							TRANSP.SYSTEM SUPPLY		
	Housing	Employment	Schools	Policy (e.g. Zoning)	Decennial Census	Am.Comm. Survey	HPMS (VMT)	Other VMT	Traffic Counts	Transit Bdgs.	On-Bd. Surveys	Household Travel Surveys	External Travel Surveys	Roadways	Transit Service	Ped/Bike Facilities
SCAG	●	●	●	●	●	◐	●	●	◐	●	●	●	●	●	●	●
MTC/ABAG	●	●	●	◐	●	●	●	●	◐	◐	◐	●	●	●	●	●
SANDAG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SACOG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
FRESNO COG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
KERN COG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AMBAG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SJ COG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
STAN COG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TULARE CAG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SBCAG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SLO COG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MERCED CAG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BUTTE CAG	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SHASTA CO. RTPA	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●
KING CAG	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●
MADERA CTC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TAHOE MPO																

Source: Sacramento Area Council of Governments, May 2009. Based on assessments provided by each MPO.

Note: Regarding "Household Travel Surveys", many of the smaller MPO's rely on the Statewide survey, rather than conducting their own. Regarding "External Travel Surveys", these can be very difficult and expensive to conduct. The need to do separate gateway travel surveys for each MPO may be reduced or eliminated by a combination of: a) structuring the Statewide household travel survey to include and emphasis on longer distance, interregional/interstate/international trips; and b) a coordinated Statewide intercept survey.

Figure 3b.
MPO DATA COLLECTION / MONITORING PROGRAM ASSESSMENT SUMMARY (OTHER ELEMENTS)

MPO (Listed by Population in Descending Order)	DEMOGRAPHICS				SYSTEM UTILIZATION	
	CA Dept. of Finance Estimates	Integrated Data (econdata.net,Clarit as)	Migration / Immigration	Fertility / Mortality	Non-Motorized Travel Surveys	Airport Surveys
SCAG	🟢	🟢	🟢	🟢	🟡	🟡
MTC/ABAG		🟢				
SANDAG	🟢		🟢	🟢	🟢	🟡
SACOG	🟢	🔴	🟡	🟡	🟡	🟡
FRESNO COG	🟢	🟢	🟢	🟢	🟡	🟡
KERN COG	🟡	🟢	🟡	🟡	🔴	🔴
AMBAG						
SJ COG	🟢	🔴	🔴	🔴	🔴	🔴
STAN COG	🔴	🔴	🔴	🔴	🔴	🔴
TULARE CAG	🟢	🔴	🔴	🔴	🔴	🔴
SBCAG	🟢	🟡	🔴	🟢	🟡	🟡
SLO COG	🟢	🔴	🔴	🔴	🟢	🟡
MERCED CAG	🟢	🔴	🔴	🔴	🔴	🔴
BUTTE CAG	🟢	🟡	🟢	🟢	🟡	🟡
SHASTA CO. RTPA	🟢	🔴	🔴	🔴	🔴	🔴
KING CAG	🟡	🔴	🔴	🔴	○	○
MADERA CTC	🟢	🔴	🔴	🔴	🔴	🔴
TAHOE MPO						

Source: Sacramento Area Council of Governments, May 2009. Based on assessments provided by each MPO.