Integrated State and Local Government Policy Approaches to Transportation and Climate Change

NCHRP Project 08-36 (94)

Summary of the Executive Peer Exchange

September 9-10, 2009

The National Academies Eric J. Jonsson Center

Woods Hole, MA

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Executive Summary

The states of California, Florida, Maryland, Missouri and Washington were invited to bring teams of transportation partners, anchored by the state DOT, to a workshop to discuss their progress in implementing projects that would reduce transportation Green House Gas (GHG) emissions. The workshop emphasized projects that were aimed at reducing VMT or improving system efficiency. Each state offered a different perspective based on their experiences and their political and regulatory situations.

The teams reported some successes with programs that improved operational efficiency and fewer with measures to reduce vehicle miles traveled. Regardless of whether the state had been striving to reduce GHG from transportation for a long or short time, or whether it had weak or strong goals, the same types of barriers were reported that slowed or obstructed implementation of projects aimed at GHG reduction.

The barriers reported by the state teams fell into three main categories:
- General lack of motivation and/or knowledge regarding both the need to address climate change issues and the positive or negative effects of various approaches.
- Institutional or organizational barriers that prevented essential cooperation or even caused agencies to work at cross purposes.
- Limited funding for planning and implementing additional goals at a time of fiscal constraint.

After recognizing that the various barriers existed, the participants in the workshop considered why they were so common and persistent. The discussants believed that the following general approaches had the best potential for transforming the current setting into one that would facilitate implementing of transportation programs and projects that addressed climate goals.

1) Top-level leadership to provide clarity in policy direction.
2) Build partnerships to reduce territoriality and connect concerned stakeholders at various levels.
3) Increase assistance and guidance to grow institutional capacity.
4) Find synergies among goals and among projects.
5) Make a convincing case for addressing climate change as a transportation goal.
6) Encourage local implementation of GHG reduction measures.
7) Develop new funding strategies.

By the end of the workshop the group found that one of the best ways to address several of these needs at once was to go through the process of creating regional visioning plans. Leadership needs to feel support from below and the key to building partnerships is finding common interests among partners. A community building process, through some form of regional visioning or blueprint planning that results in integrated metropolitan plans, can do this. It can provide a framework to align state goals with local and

individual goals. As one member put it, "DOT's need a target and blueprint plans provide that." There are goals that are nearly universally shared such as economic development, health and safety, and the broad concept of "quality of life"; continuing the community building process over the years will build a framework of relationships in pursuit of those goals.

Making the case for transportation to address climate issues will require a new message and new ways of communicating. The message that thriving in an uncertain future will require a new paradigm, and that those regions/institutions/individuals that can make the shift will be the ones that prosper, is something people can easily comprehend and respond to. In addition to traditional media, meetings and events, social networking and texting/twittering can draw new constituencies into the planning process and expand the range of viewpoints. Perhaps the best way of communicating a new message is through successful implementation; for example new transit starts that have high ridership from the beginning can be used to "sell" future projects

At the federal and state level the government can foster local action through "nudges". The idea of "nudges" was expanded to encompass both incentives (carrots) and requirements (sticks) that the federal and state governments can present to local municipalities. The group agreed that the sticks should be used sparingly, possibly in the form of limited planning requirements, but nudges or incentives will be key. Examples of nudges include increasing funding for regional visioning plans or even for local land use planning, and technical support to help local jurisdictions build and sustain capacity for planning GHG reduction strategies. Ultimately, local leaders should be able to focus on building better communities and let pursuit of that goal in itself lead to GHG reductions.

Prior to the workshop the facilitators (CCAP) had written that the catchphrase "Do Measure Learn" summarized a path to take toward fostering GHG reduction projects. After two days of discussion the findings of the group led to the realization that "Doing" GHG reduction projects is easier said than done. To put it in just a few words, "Lead, Plan, Do, Measure, Learn" appears to be the way to successfully reducing transportation GHG emissions while maintaining our nation's prosperity in a changing future.

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Introduction

Climate change is rising in importance as a multi-faceted policy concern all over the world. In the United States, Congress is developing comprehensive legislation that would affect many of the ways our society uses energy, including those devoted to transportation. Thirty-five states already have anticipated federal action by addressing independently the problem of greenhouse gas (GHG) emissions, including those generated by transportation activities. Once the need to reduce transportation GHG emissions was recognized, it became clear that the sector required consideration separate and distinct from other sectors. Transportation GHG emissions are related to and affected by myriad small and large decisions made by government, businesses and individuals repeatedly every day. These decisions range from choice of vehicle type to the way a city is zoned and subdivided. Finding ways to coordinate actions and responsibilities in the pursuit of lower transportation GHG emissions will be a complex task.

Transforming the United States' transportation system will likely require an effort comparable in scope to the undertakings of the twentieth century that gave rise to our auto-oriented, largely suburban lifestyle. During that century, investments in transportation and energy infrastructure supported a steady expansion of the built environment, generally at low densities. Retrofitting our system to encourage lower carbon, higher efficiency lifestyles may take a similarly long time. It will challenge the paradigms and institutions that arose during the previous era; it will certainly take a coordinated effort that goes beyond the agencies and stakeholders traditionally associated with transportation issues.

Many states that set out to devise their own climate change plans looked first to their departments of transportation (DOTs) for guidance on how to reduce transportation emissions. State transportation agencies, in turn, considered how their actions and policies interact with those of regional and local government agencies, the public's need for transportation infrastructure and services, and their own internal goals, revenue streams and performance measures. Many state transportation agencies starting down this path encounter unforeseen barriers that can be difficult to overcome at this stage in our response to climate change problems.

In early 2009, the American Association of State Highway Transportation Officials (AASHTO), the Center for Clean Air Policy (CCAP), and the Rockefeller Foundation came together to respond to these barriers. They organized an executive level peer exchange meeting where representatives from five states could compare notes and discuss how states can better implement GHG-reducing transportation projects and policies. Each participating state was invited to assemble a team of partners and stakeholders to bring to the meeting; teams consisted of executive level officials from DOTs, executives from state environmental agencies, metropolitan planning organizations (MPOs), local government and other stakeholders that work with DOTs on climate issues. It was hoped that gathering this diverse group of thinkers in an informal peer exchange setting would generate answers to some of the tricky problems that states are facing. Ultimately, the goal was to discuss these answers and convert them into transferable lessons that could be used across the country by state, regional and local transportation officials.

The emphasis of this workshop was limited to strategies for slowing growth of vehicle miles traveled (VMT) and improving system efficiency, as it was felt that substantial work was being done elsewhere to address vehicle and fuel solutions. Within this scope, the workshop set out to examine GHG reduction strategies for state, regional and local transportation agencies, as well as determine the need for funding and technical assistance at all levels. Team members had two days to concentrate on climate change issues and bounce ideas off practitioners from their own and other states. This report documents the findings that arose from the many discussions and collaborations in the workshop. Not documented are the many side conversations and networking that the event facilitated.

Groundwork

AASHTO and the state departments of transportation, through the National Cooperative Highway Research Program (NCHRP), provided half of the funding from the project, and the other half was provided by the Rockefeller Foundation through its Transportation Initiative Program. A project oversight panel of state DOT representatives was established per NCHRP protocol, and Rockefeller appointed two members to represent its interests. The panel agreed that although vehicle technology and low carbon fuels will offer key strategies for reducing transportation GHG emissions, those technological approaches for the most part do not fall under the purview of DOTs. It was felt that this workshop would be most effective by focusing rather on strategies for reducing growth in vehicle travel and improving transportation system efficiency, which would also be a vital component of any comprehensive mitigation program.

The panel then turned to determining selection criteria for the states and teams that would participate in the workshop. The panel decided on a competitive process to select applicant teams based on their demonstrated experience in addressing climate change issues at the state level and the innovative approaches they are pursuing. The panel sought states that had partnerships and pilot projects already underway, and especially states that had advanced interagency cooperation with well-defined roles for the DOT. Of particular interest were initiatives targeting the GHG reduction potential of measures addressing VMT reduction, improving system efficiency, and even reducing construction GHG emissions. Diversity among the teams was also deemed desirable, as there are differences among states in size, growth patterns and economics that bear on their approach, success or difficulty in implementing GHG reduction programs.

AASHTO sent invitation letters and application forms to the Office of the Secretary of Transportation of all fifty states. Fourteen states responded with information about their proposed team makeup, history of initiatives addressing climate change, and their record of success and barriers encountered. After much discussion, the oversight panel recommended selection of California, Florida, Maryland, Missouri and Washington. While many other states would certainly have provided valuable input, this group covered a spectrum of geographic, demographic and policy action diversity that the panel found to be compelling.

California, in addition to being the most populous participating state, had traveled farthest down the path of regulatory approaches to transportation GHG reduction. Senate Bill 375, passed in 2008, mandated that all MPOs incorporate GHG reduction targets (set by the California Air Resources Board (CARB)) into their transportation and land use plans. CARB had already initiated a statewide public process for evaluating regional emissions plans and strategies. Washington is two decades into growth management, and recently their legislature passed explicit mandates for reductions in VMT and is now considering ways to achieve this goal. Under recent changes to Florida's growth management legislation, local governments are now required to address GHG reduction strategies in transportation and local plans. Maryland has a history of smart growth legislation is now looking to for GHG reduction strategies. Missouri represents many Heartland states that, while aware of the reasons for reducing GHG, are currently focused on restoring their economies in the face of an economic downturn.

Each of the five state DOTs took the lead role in gathering a team of partners that included executive level officials from state, regional and local government and NGOs. Prior to the commencement of the workshop, the teams met to discuss issues of GHG reduction and provide the workshop organizers with background information that was compiled into a reference report for all participants (see appendix A). The exercise that proved to be of key importance was the state teams' assessments of what they felt were the areas in which they had achieved success and what they felt were the main barriers to implementing transportation GHG reduction actions in their state.

When the teams and facilitators finally arrived at the National Academy of Sciences' J. Erik Jonsson Center in Woods Hole, Massachusetts, there was a keen sense of anticipation. The format of the first day of workshop entailed individual presentations by state teams, followed by informal discussion for as long as ideas were flowing and the participants felt it was constructive. The presentations were initially broken into background, successes and barriers. As the workshop progressed the boundaries became blurred as lessons from one state's success were applied to the challenges of another.

Overnight the organizers from CCAP synthesized the main points arising from the first day's discussions and presented them back to the group the next day in the form of tasks to four breakout groups to address the challenges that had been identified. The groups reported back their solutions, and the remainder of the time was spent in roundtable discussion. In the afternoon of the second day there was a presentation by CCAP about the relationship between VMT and the economy that was intended to stimulate thought about the changing milieu in which transportation agencies are finding themselves and the transformation of their overall goals.

Identifying Barriers

As the peer exchange opened, the state teams gave presentations about their respective climate legislation and current transportation GHG reduction efforts. Every team was able to report successful implementation of some GHG-reducing measures. Although climate change mitigation has been initiated only within the past few years in most cases, many states have

been implementing flow improvement and driving reduction programs for much longer under the rubric of congestion mitigation and increasing the efficiency of transportation investments. Intelligent Transportation Systems (ITS) projects, signal synchronization and bottleneck elimination projects were reported by all. Scattered success was achieved with Transportation Demand Management (TDM) projects such as carpool lanes and commute trip reduction programs, as well as transit expansion or improvements in cities. All states still project future VMT growth that is likely to require still more efforts to slow or stop reverse this trend.

After reviewing successes, discussion turned to each state's assessment of the barriers they face in implementing transportation GHG reduction programs and projects, and identifying themes common to all. Often just coming up with strategies that could achieve the deep reductions called for in a climate plan is difficult. Even when a set of strategies is developed and agreed upon, implementation of some parts can be slow or non-existent.

The barriers expressed by the state teams fell into three main categories:
- General lack of motivation and/or knowledge regarding the need to address climate change issues and the positive or negative effects of various approaches.
- Institutional or organizational barriers to implementing the necessary actions.
- Limited funding for planning and implementing additional goals at a time of fiscal constraint.

While these categories commonly merge and influence each other, each type of barrier and illustrative examples cited by participant teams are detailed below.

Lack of Motivation/Knowledge

For every geographical area, a wide spectrum of concern and interest in climate change exists among transportation professionals, elected officials and the public at large. At one end of the spectrum, a substantial segment holds that addressing climate change is either not necessary or not advisable under current conditions. Others argue that although climate change needs to be addressed, it can and should be done without implementing strategies that are aimed at reducing VMT. The interrelationship of the economy with vehicle travel has been pointed to as a reason why society would be better served by reducing the amount of carbon emitted per vehicle mile than to target VMT. Finally, even those who recognize a need to examine and implement VMT reduction strategies often desire more knowledge about the economic effects (either positive or negative) and the magnitude of achievable reductions, costs and information about best practices. In other words, there is a desire for concrete cost-to-benefit analysis of VMT reduction.

Some specific examples of motivation/knowledge barriers that were brought up by participants during the workshop are listed below:

Concern about the economic impact on society. The Missouri team stated that because so much of the state's economy is based on road travel, it would be risky to promulgate a policy to "downsize highways".

Lack of technical capacity. The Washington team reported that as they consider the costs and benefits of VMT reduction versus other types of measures, one issue that arose was the

uncertainty of knowledge about the rate of vehicle technology penetration and the lifecycle costs and impacts of alternative fuels and batteries.

Differences in acceptance and usefulness of measures in rural versus urban areas. The Washington state team raised the issue of differences in lifestyles and economic basis between rural and urban Washington, and how these led to a split in support for VMT-reducing measures between the two constituencies.

Need to develop objective performance measures. According to the Washington team, accurate and objective ways of measuring GHG reduction potential and performance are essential. Under their legislative regimen, statewide GHG targets may need to be allocated regionally on a basis that strives to be not only reasonable and achievable, but also politically acceptable, as is being done in California in response to state Senate Bill 375. Developing ways to predict and monitor the effects of proposed plans and measures is essential for this process to proceed.

Institutional/Cooperation Issues

A second set of barriers to implementing VMT reduction and system efficiency measures to reduce transportation GHG emission are rooted in institutional and organizational structures of agencies responsible for transportation infrastructure and land use regulation. Issues can arise both within and between organizations. Internally, institutional inertia, agency cultures and long established missions can be at odds with new demands to address climate change. The ability of agencies to respond to new directives and performance measures may not be fully understood by elected officials. Horizontal and vertical coordination by transportation and environmental agencies across state, regional and local levels may be less than optimal at this stage; territoriality and conflicting goals may exist. There is the potential for a mismatch of responsibility and authority as well.

State teams raised a number of institutional issues during the peer exchange including those listed below:

Limited understanding of transportation issues during climate goal setting process. Some participants felt that key transportation realities were overlooked during the climate planning process. Washington expressed concern about how achievable the legislated VMT goals actually are. Florida team members also mentioned that it will be difficult for Florida DOT to assume responsibility for substantial transportation GHG reductions since they are responsible only for 10% of Florida's roads; the cooperation from other transportation partners (MPO, regional transportation agencies, and local governments) is required. California participants alluded to tension between the collaborative blueprint planning process and the more regulatory-oriented framework that came out of SB 375.

Transportation and land use goals sometimes at cross-purposes. Florida's team discussed how the state's concurrency law, which requires roadway capacity to be available before growth could occur, has encouraged growth where more road capacity exists, with the unintended result of discouraging urban infill and redevelopment. Now the new changes to the law exempt dense urban land areas from the transportation concurrency requirements, although it does require that plans be developed to support and funding mobility in the area,

including transit. Florida also commented that it is difficult to take 2030 fiscally constrained plans seriously if they continue to assume funding from fuel taxes.

Not in My Backyard (NIMBY) pressure at local level. Maryland participants described local opposition along the proposed right-of-way for the new Metro Purple Line light rail. Such resistance hampers implementation of a much-needed transit solution to regional transportation congestion. They also mentioned the effect on freight movement that results when local warehouse districts are rezoned to residential, requiring freight to be distributed from more distant points, thereby increasing GHG's. The California team raised an interesting point about the resistance to infill from local jurisdictions because their outdated water and sewer infrastructure cannot handle increased densities. The localities may recognize benefits of higher core densities, but they cannot resolve questions of who will bear costs of replacing these utilities.

Division in authority between GHG target setting, transport project implementation and land use regulation. Missouri's team mentioned that local jurisdictions are often concerned with economic development rather that climate change, yet it is they who make land use decisions. Florida team members discussed the difficulty in implementing regional visioning plans when cities have individual authority for land use under home rule. They mentioned that their state's Department of Community Affairs often is reluctant to deny approval to a city's comprehensive plan, even though they have authority to do so. The Washington team pointed out that sometimes the same public official that supports action on climate change may support a local road project that will increase VMT.

California is trying to address the question of making local zoning consistent with regional blueprint visions. In the past, forward-looking projects have been denied because they run counter to (often out of date) zoning codes. Although California has established the Strategic Growth Council to encourage and fund sustainable planning, local government is not yet present at the Strategic Growth Council table. Maryland's team also agreed that local control of land use was a major barrier to VMT reduction measures.

One size doesn't fit all. Florida's team reported that some of the visioning processes in the state have run into trouble because each city wants to keep its own vision. By just taking local future projects and trying to weave them together as a "regional plan," they often overlook necessary connections. Also, in some large regions there is more than one MPO, and some are resisting consolidation and insisting on doing separate long range plans.

Lack of a mandate. Missouri's representatives made clear that in Missouri they have no mandate at the state level to address climate change. Maryland's team said they are just beginning to talk about VMT and are still reacting to the state's climate plan through a vetting process.

Conflict with traditional or current DOT goals. For Missouri, addressing climate change, especially through VMT reduction, would be an added goal for the DOT conflicting with its current core goal of providing mobility. Florida remarked that the state has no culture of transit, but rather a steady history of road building; expectations are that this trajectory will continue. Floridians also noted that their current orientation is for severe weather events

(hurricanes) where the primary goal is to get back to normal as quickly as possible. Climate change is not a discrete weather event in this sense: there is no "normal" to get back to.

Lack of Planning and Project Funding

The Highway Trust Fund has not been able to meet previous financial projections and federal funding is being cut back. As a result, state DOT's are facing constraints in paying for projects already on the books. The economic downturn of 2008 has reinforced this problem at all levels of government. Even before the financial crisis hit, infrastructure maintenance needs were increasing; they now compete strongly with new project funding under reduced budgets. At the time of the workshop, the transportation authorization bill, SAFETEA-LU, was due to expire within a few weeks. At the writing of this report, the bill has been extended several times and no full reauthorization appears forthcoming. This means that the amount of future funding for transportation projects remains uncertain; new projects may be at a disadvantage.

State resources constricted. The Washington team reported that their state revenues are down 9%

Backlog of maintenance/congestion relief projects. The Missouri team expressed the concern that they don't have the money to make vital repairs to existing infrastructure, much less build new GHG-reducing projects.

Reducing VMT will further reduce future gas tax revenues. The Florida participants remarked that Florida is a "sprawl" state with substantial infrastructure needs and inadequate funding already; reducing VMT would likely exacerbate the funding problems under current revenue streams. This "funding paradox" applies across the nation.

Competition between long-term and short-term horizons. Two states conjectured that tension between long- and short-term needs had led to a lack of motivation for funding certain measures. Floridians talked about trying to leverage money to fund and operate SunRail; although in the long term it would be a very effective GHG solution, rail service takes years to get up to speed, so it is not seen as a priority by some when compared to other measures. The Maryland team brought up the same type of problem with regard to land use changes. The time frame for achieving reductions in their state's climate plan is too short for land use measures to have their full effect, so they are not seen as having the importance of other measures.

Considering Barriers at Different Levels of Government

Over the course of the workshop, it became clear that removing a barrier at the Federal or State level may not solve the problem at the MPO or local level (and vice versa) because each jurisdiction carries out a slightly different mix of responsibilities and activities with regard to transportation. Thus, broad policy is set at the federal and state level, land use and infrastructure planning occurs more at the regional and local level, while project implementation is mainly state and local. Of course, travel behavior ultimately occurs at the level of the individual.

One of the strengths of the peer exchange workshop was the partnering of executives from different governmental levels, which allowed multiple perspectives to be considered and

correlated. As solutions to barriers were proposed throughout the meeting, the partner teams refined them to ensure they would be applicable and effective at multiple levels. The group's diversity helped in the formulation of recommendations that would not have adverse or unintended consequences on the overall transportation and land use framework

Summary of Needs

Numerous suggestions were made regarding changes required to address barriers to climate change actions. A number of common themes arose, falling into seven broad categories in the form of statements of needs:

1) **Need for top-level leadership to provide clarity in policy direction.** The Governors of California and Washington were mentioned as examples of high level elected leaders who unambiguously have made climate change one of their priority issues.

2) **Need to build partnerships to connect concerned stakeholders at various levels.** Reducing territoriality will promote "ownership" of policies across jurisdictions. One suggestion was create three way communications between elected officials, DOT's and stakeholders. Another example would be to gain support from the business community for regional visioning.

3) **Need for increased assistance and guidance to grow institutional capacity.** Assistance can be targeted at all parts of the transportation process, from planning through implementation to monitoring and performance measurement. Specific capacity-building assistance should target data collection, modeling support and development of GHG performance metrics. New ways should be found for delivering other types of assistance such as simulation and visualization tools, outside guidance documents (e.g., California Air Pollution Control Officers Association's "Model Policies for Greenhouse Gases in General Plans"), or examples of form-based or other zoning code models.

4) **Need to find synergies among goals and among projects.** Measures that reduce GHG emissions often address other transportation goals as well. By restructuring programs at the federal and state level to provide financial tools and leverage for synergistic projects, funding could be redirected to common priorities at the same time that agencies could get more bang for the limited buck.

5) **Need to make the case for addressing climate change.** A convincing case must be made that addressing climate concerns will not adversely affect the economy. Leaders must be shown that the public will support this goal. Finding a common language to address common concerns and a table to come together to solve problems will be a good start.

6) **Need to encourage local implementation.** Local autonomy is a keystone of our democracy. "Nudges" and capacity building efforts by state and federal governments would likely be the most effective way for them to influence local government policy decisions For example, state practitioners can remind local agencies of their own responsibility for upgrading suburban roads if it appears that local decision makers oppose new infill development. Also, although most GHG emissions are generated in

metropolitan regions, funding doesn't always flow to the local problem areas, as other priorities are ingrained.

7) **Need to find new funding strategies.** The current transportation funding system is broken. As we go about fixing it, we need to find not only new sources of money, but also ways to adjust spending priorities to support new goals.

Finding Solutions

After drawing up this "needs list" for addressing barriers to GHG reduction, the workshop turned to brainstorming ways to meet those needs. Participants divided into four breakout groups; each group included a mix of states and organizational representation. In choosing four themes for the breakouts, it was decided that the need for leadership and for funding transcended all others and therefore should be considered by each group. Technical assistance and capacity building were merged with the goal of building partnerships to yield the following focus topics:

- Building Partnerships and Growing Capacity
- Identifying Synergies
- Making the Case
- Fostering Local Implementation

The breakout groups took advantage of the range of participants' expertise and practical knowledge and built on team members' on-the-ground experiences to come up with many innovative proposals. Many of the successes which had been reported in the earlier presentations provided jumping off points for thinking about how barriers could be overcome and needs could be satisfied. The summaries below encapsulate the results of brainstorming sessions. These ideas form the raw material for the final findings of this collaboration; they were not formally vetted for cost effectiveness or their potential for universal application.

Building Partnerships & Capacity

The first breakout group considered how to build partnerships of groups and individuals with similar and/or overlapping goals and mandates at both the institutional level and among the public at large. Participants recognized the importance of leadership, but also stressed that leadership needs to feel support from below. The group thought that the key to building partnerships is finding common interests among partners; a mechanism for integrating diverse interests will prove key. Common interests in the economy, safety, public health and schools were identified as possible starting points.

Furthermore, the group found that capacity -building can be advanced by bringing together stakeholders with different expertise so they can apply their diverse skills to solving a common problem. An additional benefit comes from sharing successful strategies from different areas or levels of government. Gathering stakeholders can be facilitated by new technologies of social networking and wiki-style communications.

The Partnerships and Capacity group concluded that the best mechanism for identifying common interests is some form of regional visioning or blueprint planning that results in integrated metropolitan plans. As one member put it, "DOT's need a target and blueprint plans provide that." Such a process is traditionally bottom-up, based on broad public input facilitated by professional planners. One successful implementation of the blueprint planning technique that participants referred to was the Puget Sound Regional Commission process, then underway at the time of the Woods Hole meeting. Public acceptance of this process was an indication of its success. Florida was also able to point to several regional visioning plans in differing parts of the state. California's SB 375 legislation focused on the visioning mechanism as the best way to achieve equitable transparent goals and targets for GHG reduction.

Expanding constituencies was considered a key to achieving success in the blueprint process, so that small interest groups would be less likely to exert disproportional influence. Reference was made to "strategic constituency building." Using all forms of media to raise awareness and engage popular interest can ultimately lead to increased participation. Of prime importance will be for stakeholders (especially at the institutional level) to take "ownership" of policies. Unenthusiastic acceptance of a strong policy was thought to be worse than strong commitment to a weaker one.

Formal interagency cooperation was cited as something to be facilitated as early as possible. Indeed, many of the successes reported by state teams during the workshop involved efforts to improve communication and cooperation. Missouri reported that MoDOT has been making progress in modernizing their culture by assuming more of a policy focus. California reported success by the newly created Governor's Office of Planning Research (and its offshoot, the Strategic Growth Council) as coordinating agency. This theme proved so compelling that several team members re-assembled for coordination meetings soon after returning to their states.

Finally, the first breakout group made a recommendation that a key capacity building effort should be made to enable decision makers visualize the fiscal impacts of GHG-reducing measures. One participant recommended a state-funded Blueprint plan process that explicitly emphasizes fiscal issues so jurisdictions could "raise public revenue by doing growth right, not simply by doing growth." In this spirit, the Maryland DOT decided to organize a symposium on the relationship of VMT to the economy. Accurate information about the co-benefits of Smart Growth and examples from successful places such as Bethesda, Maryland, which has experienced increased values per acre, greatly enhance the analysis of the costs and benefits of different bundles of policies.

Identifying Synergies

The second breakout group was charged with devising ways to improve the identification of synergies among goals. One of the impacts of institutional separation of expertise is that organizations can find themselves unnecessarily working at cross-purposes internally and/or externally. Multiple solutions to a given goal may in fact exist, but only a subset of them interact favorably with other goals. Finding policy, program or project solutions that meet multiple objectives is becoming more important in an era of constrained resources and ambitious goal-setting.

This group recommended that states and their agencies begin by clearly defining goal being pursued. When an organization becomes inward looking and begins to lose track of the larger purpose for which it was created, decisions can be made that lead to less than optimal results. The group felt that explicitly identifying and focusing on common goals/motivations can counteract this problem. Examples of goals that are nearly universally shared are economic development, health and safety, and the broad concept of "quality of life." If organizations routinely remind their personnel of these types of goals, they can more easily find common ground within divisions and with other stakeholders. Balancing GHG mitigation with climate adaptation efforts is another way that more than one goal can be met through synergies.

Participants referred to a community building process. Through sustained interaction, a community of diverse stakeholders can identify their common interests, and realize positive and negative effects of their actions on others. The synergies breakout session members strongly felt that the community building process needed to be continuous, that relationships should not end just because a particular plan was approved or a project was finished. The process itself is needed to sustain the community capacity for understanding and to prevent reverting to prior separations of interests.

Key to successful integration of missions at different levels or across institutions is the commitment and trust of high-level leadership. The group felt that strong leadership leads to, and is in fact prerequisite for, the integration of planning. Separate agencies representing portfolios such as economic development, transportation, housing, health or environment would thus be at the table during the initial goal setting exercises that guide future policies and actions. The group emphasized that coordination needs to start at the top. A balanced, holistic and integrated planning process should provide the broad context for multi-modal, multi-dimensional goals at national, state, regional and local levels.

Making the Case

Persuading people and institutions to make any kind of major change is always difficult. The third breakout group looked at best practices for "making the case" that mitigating and adapting to climate change is not only necessary but also is compatible with the interests of many stakeholders. The group noted that many stakeholders express doubts about addressing climate change: while agreeing that it is a worthy goal in general, they often perceive that mitigating actions will cause negative impacts to themselves as individuals or as institutions. Making the case will require answering the concerns of many diverse interest groups and demographic categories.

California team members indicated that climate change has actually proven to catalyze the gathering of many (previously disparate) threads of land use planning ideas into a common theme. They also cited the team building effect of GHG legislation as various agencies pulled together to address a complex and difficult mandate.

Participants stated that the key to effective communication lies in tailoring the message to different audiences. Common divisions include urban/rural, older/younger generations, public agencies/private enterprise. Communicators, such as policymakers who serve as champions and planners who interact with the public on land use and transportation issues, need to be flexible and prepared with the appropriate message for their audience. In all cases

the use of direct and accessible language is crucial; technical terms such as "VMT" or "capacity" do not convey to most people what is at stake for them.

The group focused on translating technical information into "emotional arguments" that framed the low carbon transportation vision in a way people can easily comprehend and respond to. Appeals to the pocketbook have proven effective: emphasizing the transportation cost savings to be gained from less congestion, shorter commutes and more efficient vehicles. Looking at fiscal benefits on a life-cycle basis may provide more compelling evidence of the advantages of low emissions strategies (e.g., infrastructure cost savings lead to lower taxes). The increased convenience from reduced delay and a feeling of empowerment from the availability of choices due to better transit service and/or better overall accessibility are other ways to show how the individual can gain from policies that also reduce transportation GHG emissions. Many participants pointed out that national energy independence and security is a powerful argument that appeals to many audiences. Another positive message is increased resilience in the face of economic variability, especially fuel costs. Households in travel efficient communities spend a smaller percentage of their budgets on travel and thus experience less of an impact from fuel price volatility. The potential for expanded economic development provided by the need for new technology and infrastructure jobs is another recognizable benefit from a change in transportation policy.

All of the arguments listed can be packaged into the idea that thriving in an uncertain future will require a new paradigm, and those regions/institutions/individuals that can make the shift will be the ones that prosper. Perhaps the best way of communicating this message is through successful implementation; for example new transit starts that have high ridership from the beginning can be used to "sell" future projects. Places that can demonstrate prosperity and resilience due to thoughtful planning and transportation choices serve as examples that will inspire others.

Finally, the third breakout group felt that collaboration by varied interests who take ownership of a coherent, unified message, can increase effectiveness. They also emphasized that the message can be delivered in many ways to reach new audiences. In addition to traditional media, meetings and events, social networking and texting/twittering and the like can reach beyond the core constituency and generate continuing interest in the need and benefits of addressing transportation GHG emissions.

Fostering local implementation

Although state transportation agencies have a powerful influence on MPOs for many highway projects, other alternative mode projects, system efficiency improvements and trip reduction measures are generally local in nature; they usually are implemented by cities or other local jurisdictions. Land use decisions, under the control of planning commissions and zoning boards, are also locally made.. Even when a state DOT strongly encourages GHG reduction goals and policies, it can be difficult to get these kinds of projects implemented if there is local opposition or if matching funds from local jurisdictions are not forthcoming.

The fourth breakout group began their approach to these barriers by taking a step back to look at the bigger picture: the ultimate goal of planning communities and transportation systems is not to reduce GHG or to improve mobility; it is to improve quality of life by building "world-

class" communities and transportation networks. Metrics such as VMT or tons of GHG are simply performance measures that show progress toward improved quality of life. By aligning federal, state and local interests to this aim, and making a deliberate outreach to the community with this message, it may be possible to reconcile conflicting goals. This could be done through federal and state level "nudges," such as policy statements, that are carried through to regional visions, local plans and ultimately, individual behavior.

The idea of "nudges" was expanded to encompass both incentives (carrots) and requirements (sticks) that the federal and state governments can present to local municipalities. The group agreed that the sticks should be used sparingly, possibly in the form of limited planning requirements, but nudges or incentives will be key. Examples of nudges: increasing funding for regional visioning plans or even for local land use planning; technical support to help local jurisdictions build and sustain capacity for planning GHG; and direct state investment in specific projects. In a demonstration of leading by example, Maryland built a new state office complex at a transit station on DOT land recently. Publicly supporting local leadership publicly, helping them remove barriers, and providing incentives for private investment – these suggestions rounded out the group's quick list of nudges.

Finally, the "fostering local implementation" group returned to the idea of leadership. Local leaders may need to focus on building better communities and let pursuit of that goal in itself lead to GHG reductions. In responding to concrete needs of their constituents, they often look to higher-level government for help. Maryland, for example, spent federal economic stimulus money on rail needs, including park and ride lots to help communities solve pressing mobility problems. Maryland is also allowing Transit Oriented Developments as an eligible transportation expense, which allows communities to incentivize developers to build them. This is an important step that allows transportation funding to be used to support intensifying land uses around transit stations, in addition to actual infrastructure for moving passengers. In Missouri, the Kansas City MPO is achieving metro-level success in planning for GHG reduction that is catching the attention of state officials. Local leadership teams can also publicly support state implementation of GHG reduction projects.

I. Build Partnerships & Capacity
- Replicate the Blueprint Model (integrated metro plans)
  – Regional decision-making, bottom-up
- Build Constituencies
  – Ownership of policies
  – Working across silos
  – Tapping into people's values
- Fiscalize smart growth
  – Identify the co-benefits

II. Identify Synergies
- Identify and focus on common goals and motivations
  – Economic development, health, quality of life
- Develop community building process and sustain community capacity
- Encourage High Level Leadership
  – Commitment/trust to integrate missions
- Integrate of planning efforts
- Create a balanced, holistic and integrated planning process that provides the broad context for multi-modal, multi-dimensional (State, multi-state, regional, local), practical and realistic strategies

III. Make the Case
- Tailor the message to the audience
  – Urban, rural, generational
  – Use of language is key – direct and accessible –Positive messages
- Use emotional arguments
  – What do you need to thrive in the new economy
  – Economic resilience and sustainability
  – Choice empowering the individual
  – Opportunity for new technology
  – Independence and energy security
  – Prosperity – perhaps a new term "climate prosperity"
  – Reduced delay equals more convenience
  – Overall housing/transportation costs
- Use collaboration and ownership to develop an effective message
- Realize that implementation is communication–E.g., new start transit with high ridership
- Use a range of delivery mechanisms from traditional to newest

IV. Foster local implementation
- Align National and local goals using "Nudges" - sticks and carrots
  – World class community building, supported by world class transportation network
- Undertake deliberate outreach to citizenry,
  – Show the nested interests of national and state "nudge" with regional and local visioning and planning and ultimately individual choice
- Remove barriers to and provide incentives for private investment
- Encourage local leadership,
- Cultivate sustained local capacity
- Realize that VMT & GHG reductions are performance measures, not primary goals – consider the goal of world class communities
  – Other performance measures include environment, economy, health, education, etc

Table 1: Strategies for Solutions

Conclusions

Near the end of the meeting, CCAP presented adaptive management under the banner "Do, Measure, Learn" as a draft summary of the workshop's findings. Participants quickly pointed out that the first element is complicated. Implementing policies and programs without good planning, they said, can easily launch an agency on an unproductive trajectory. Yet, others argued, too much planning often leads to paralysis and a fear of change. The group agreed that agencies need to take the decisive step of adopting a clear goal of reducing GHG emissions from transportation, and then carefully plan so they will do it right. This priority highlights the role of leadership. Leaders need first to commit to action then carry out just the right amount of planning to avoid common mistakes. As experience is gained, planning will become easier and the planning segment of this process will be strengthened. During the lively discussion that wrapped up the workshop, ideas were spun out into an approach that now can be abbreviated as "Lead, Plan, Do, Measure and Learn."

Lead

Leaders who already are well received and respected can best risk making a decision without complete foreknowledge Workshop participants noted examples of charismatic leadership for transportation and climate issues including Mike McKeever of the Sacramento Area Council of Governments; Enrique Peñalosa, the former mayor of Bogota, Columbia; Janette Sadik-Khan of the New York City Department of Transportation; and Ron Sims, former Executive of King County, Washington. They acknowledged that leadership types can vary – besides charismatic leaders there are quiet leaders who build institutional capacity for long-term change, and "small" leaders who push their organization to continually improve. These leaders frame the goals and challenges, tell the story, and make it safe to change.

The group discussed how leaders make the case for addressing climate change: getting people involved and invested in climate and transportation issues, while responding to "pushback" against sound transportation policies. Leaders promote good decision-making when they give people choices that align with their needs; to do that, leaders need to learn what these needs and desires are. Strategies for this include stakeholder processes such as visioning plans, conducting focus groups to help define parameters of discussion, and tailoring communication to each audience. Legislation, particularly, should be explicit as to what is *not* included, such as local land use control, to ease concerns and pre-empt possible negative or misleading reactions.

Leaving technical jargon behind and making "emotional arguments" that tap into common values is also important. People prefer thinking in terms of themes like economic stability, personal choice and freedom. Leaders must return to the basic question, "What do we need to thrive in the new economy?"

Plan

Discussion about planning focused on tensions between top down and bottom up. Participants thought that planning for a lower GHG transportation system needs to be informed from both directions at once. Goals and direction flowing from the top down should guide the plans but programs and actions should be developed from the bottom up. The best planning, they said, builds momentum by listening to the needs of stakeholders and the general public, providing

information, and guiding the process to the best feasible solution. Discussants reiterated that blueprint planning or vision planning at the regional level is an effective way to balance the top down/bottom up approach. State level planning and, in some places, multi-state planning efforts, should not be neglected, though, so as to avoid plans replicating or contradicting each other.. Finally, the group felt it imperative to improve coordination at multiple levels of government, perhaps by creating integrated, multidisciplinary teams that can then create integrated, multidisciplinary solutions and build organizational capacity. This coordination can be encouraged by federal and state government through incentives, regulations, or both.

DOT participants reminded the group that regional visioning plans must address the rural/urban divide. Although the boundaries between rural, suburban and urban status tend to be blurry, plans need to recognize that differences do exist. It was pointed out that many GHG reductions are achievable from transportation in rural areas through paratransit, broadband access, carpooling and telecommuting. Rural areas need to be engaged in the discussion; buy-in from rural areas can be sought through stakeholder outreach, scenario planning, seeking GHG reductions from an agricultural preservation/rural sprawl standpoint, and other approaches. One particularly promising avenue for rural GHG reductions is freight planning and freight multi-modalism.

Everyone agreed that assistance should be available to ensure that agencies have the capacity to take on the additional core goal of GHG reduction. Specific needs mentioned included help with planning, implementation, funding mechanisms, measurement, modeling, project level GHG emissions, and tracking the latest information emerging from climate science. Participants agreed that more outreach should be done to determine the specific needs agencies have for technical assistance and capacity building.

Do

Participants recognized that changing the pattern of investment to shift towards a low GHG transportation system would mean doing many things differently. Initially, communities may look at changing program and funding priorities, implementing tangible and visible projects, and balancing both short and long term projects. Later they may have to re-think current transportation and land use plans (including projects that are already funded).

As the group considered exactly how to "Do" more GHG reduction projects, many different ideas surfaced. The priorities of projects already programmed in TIPs or STIPs could be altered by implementing measures expected to have a tangible effect on reducing GHG emissions while postponing big-ticket projects that increase capacity without necessarily improving efficiency or reducing VMT. The balance between projects that are inexpensive and have a short-term benefit versus more expensive measures that are seen as investments for the long term will become a key question for decision makers. The "quick and cheap" actions will take on symbolic importance for jurisdictions trying to prove the cost effectiveness and community benefits of implementing a few key, high profile strategies. However, longer-term actions will still be important for setting the stage for the future, when greater reductions will be necessary.

Taking a longer view, some participants noted that changes will have to be made by not only government, but also businesses and individuals. Land use and settlement patterns are, in some places, already reversing the outward flow from the cities to suburbs. Government

policies should empower businesses and individuals wanting to make this shift through incentives and flexible regulations that enable innovative ideas and projects. These changes may be reflected in revamped land use and transportation plans that reinforce the new trends; DOTs will need to be ready to rethink projects that are already on the books as part of a changed vision for the future transportation system.

The entire group felt that the role of the federal government should be to provide the "nudges" that help states and regions turn in the right direction, and this should include funding. A climate bill is a logical source of support, but even without such a bill the federal government can help state and local governments by embedding energy, climate, and technical assistance into existing programs and funding. The HUD-DOT-EPA Interagency Partnership for Sustainable Communities[1] is aimed at doing this. A good model is the FHWA's Transportation Investment Generating Economic Recovery (TIGER) program which used stimulus funds and explicitly judged transportation projects on their ability to meet a number of goals simultaneously. Other participants pointed out that in any program to promote the "Do" phase, the tension between accountability and flexibility should lean toward allowing states and regions to find their own methods of achieving transportation climate goals.

Table 2: Long Term Outcome TIGER selection criteria:

1. Long-Term Outcomes

a. State of Good Repair: Improving the condition of existing transportation facilities and systems, with particular emphasis on projects that minimize life-cycle costs.

b. Economic Competitiveness: Contributing to the economic competitiveness of the United States over the medium- to long-term.

c. Livability: Improving the quality of living and working environments and the experience for people in communities across the United States.

d. Sustainability: Improving energy efficiency, reducing dependence on foreign oil, reducing greenhouse gas emissions and benefitting the environment.

e. Safety: Improving the safety of U.S. transportation facilities and systems.

Source: /www.dot.gov/documents/finaltigergrantinfo.pdf

Finally, the group recognized that under the current dual challenges of recession and massive state budget cuts, GHG reduction projects face an uphill battle. Some suggestions for overcoming these obstacles included: building on existing, familiar programs and policies (e.g., expand a commute trip reduction program rather than start a VMT reduction program); fiscalizing smart growth by taking a broader look at benefits and creating new models for revenue generation; and reallocating existing sources to fund different kinds of projects.

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[1] http://www.epa.gov/dced/partnership/

Measure, Learn and Prosper

Measurement is essential to making sure we are accomplishing what we set out to do. Yet, as participants pointed out, performance measures in policy often end up measuring things that people don't really care about. They can become an end in themselves. Although GHG reduction is clearly important, some of the workshop participants felt that the true goal of land and transportation policy should be creating "world class communities"." If this is accepted, performance measures should include GHG and VMT, but also address other aspects of the environment, economy, and equity: health, education, access to services, mobility, location efficiency, open space/agricultural preservation, etc. Any federal policy to reduce transportation-related GHGs would in that case be well served to approach measurement in a holistic way and provide the necessary resources to measure progress on all fronts. The Sustainable Communities Partnership, as mentioned, is targeting multiple goals, and formulating performance measures that could encompass such broad and diverse concepts.

The key to any "Lead, Plan, Do, Measure Learn" program will be to dispassionately look at the results of our efforts and be prepared to adapt as necessary. As the United States and the world move toward a low carbon economic and transportation system, we face a steep learning curve As communities implement transportation projects aimed at reducing GHG emissions, each will respond in its own way. Learning what works where, and why, will allow practitioners and policy makers to continually refine their efforts and evolve the most effective ways to reach their goals. Federal and state transportation departments have a role as centralized repositories and synthesizers of this information. As data and modeling improve, rapid dissemination of the latest findings will facilitate more successes and fewer "dead ends."

Changing DOTs and regional planning agencies is the easy part; finding sustainable solutions to economic, quality of life, energy security and other issues will require boldness of action but confidence in our vision. The transformation of America's transportation system has already begun in many states and regions across the nation. It is happening slowly and cautiously, and taking different forms that reflect the diverse character of our communities. As pressure to act intensifies (perhaps triggered by rising energy costs, increased public awareness or federal and state demands), the transferable principles from this workshop can help guide changes so they are less disruptive and more evolutionary.

Appendix A

BACKGROUND PAPER
Prepared by the Center for Clean Air Policy

Fostering GHG Reductions in the Transportation Sector
by Slowing VMT Growth and Increasing System Efficiency

Executive Workshop on State Transportation and Climate Change
A Workshop to Foster GHG Reductions
by Slowing VMT Growth and Increasing System Efficiency

Organized by AASHTO and CCAP
With funding from the Rockefeller Foundation and
the National Cooperative Highway Research Program (NCHRP)

Hosted by the National Academy of Sciences at Woods Hole, Massachusetts
September 9-10, 2009

INTRODUCTION

Concern about the climate change effects of greenhouse gas (GHG) emissions has been increasing worldwide over the past few years. By 2007, when the Intergovernmental Panel on Climate Change (IPPC) won the Nobel Peace Prize, government actions to address the issue had become widespread. In the United States, the federal government response was slow, but states and cities took the initiative to formulate plans and strategies to try to reduce GHG emissions in their jurisdictions. Thirty-three states have now completed - and three states are in progress of creating - statewide climate action plans to address economy-wide reductions in greenhouse gas emissions – including Missouri, Maryland, California, Washington, and Florida[2]. Generally these plans follow the lead of the IPCC or similar sources in setting goals and paths to reduce GHG emissions back to 1990 levels by the year 2020 and to achieve a level 60 to 80 percent below 1990 by the year 2050.

As states move forward with implementing strategies to reduce GHG, transportation agencies are experiencing successes and challenges. This workshop is intended examine these experiences in a way that will contribute to the knowledge base and help state transportation departments enhance their capacity and capability to consider and implement VMT and system efficiency solutions to reduce GHG. During the next two days, partner teams from five states will share successes and lessons, identify challenges and obstacles, and discuss opportunities and needs for with implementation.

The background paper was prepared by CCAP with the help of the Department of Transportation (DOT) teams from each state. The material is organized into three sections:

1) **General information** on state climate plans nationwide and how the five states in the workshop fit in within that context.

2) **Appendix A:** Concise summaries of the key transportation and climate planning and implementation activities from each of the five states.

3) **Appendix B:** Tables and graphs comparing action timelines, targets and VMT and GDP change for the five states.

STATE CLIMATE PLAN PROCESS

Most states that address climate change prepare a plan and set goals and GHG targets. The resulting steps are typically similar to those listed below, although the order and length of each step may vary.

- ***Initial interest from governor or legislature*** - This could include the state joining a regional GHG credit trading initiative or an emissions registry.

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[2] Pew Center on Global Climate Change. 2009 http://pewclimate.org/what_s_being_done/in_the_states/action_plan_map.cfm. Accessed 21 August 2009.

- ***Set up a commission or task force and hire consultant or assign a state agency to prepare a plan*** - Many states gather stakeholders and form a commission or advisory group. The group may continue to be active after the plan is completed.

- ***Review or prepare a GHG inventory*** – A state that already requires reporting or has joined a registry a may have an inventory. Inventories usually include how much GHG is being emitted and quantifies each sector's contributions to existing GHG emissions.

- ***Set a statewide (economy wide) target for overall reduction*** – These targets are usually based on scientific studies of reductions needed to slow climate change. Climate plan targets are only guidance but may be followed by legislation or executive orders which enforce them.

- ***Evaluate strategies to reduce GHG*** – An array of possible GHG reduction strategies are considered and evaluated for their feasibility, the amount of reduction possible from the strategy, and the cost effectiveness of the strategy.

- ***Publish a Climate Action Plan*** – The Plan lists the targets, and the strategies that are deemed best for attaining the target. It may also contain recommended strategies for adapting to the possible results of climate change within the state.

The table below shows the actions the states in this workshop took as they engaged in the climate planning process. The table also shows the overall number of states that have taken each action.

General GHG Planning Actions						
	California	*Florida*	*Maryland*	*Missouri*	*Washington*	*Nationwide*
Joined Regional Initiative	yes	Internal C&T	yes	no	yes	32
Active Climate Change Commission or Advisory Group	yes	yes	yes	no	yes	23
Developed GHG Inventory	yes	yes	yes	yes[1]	yes	43
GHG Registry	yes	yes	yes	yes	yes	41
Climate Plan Completed or in Progress	yes	yes	yes	yes[2]	yes	36
Set GHG Target	yes	yes	yes	no	yes	20
Adaptation Plan	yes	yes	yes	no	yes	15

[1] **EPA 1990 GHG Inventory**   [2] **Status uncertain**

2020 GHG Reduction Targets						
	California	*Florida*	*Maryland*	*Missouri*	*Washington*	*IPCC (Annex 1 nations)*
2020 GHG Target	*1990 by 2020*	*1990 by 2025*	*4% below 1990 by 2020*	*N/A*	*1990 by 2020*	*25 to 40% below 1990 by 2020*

TRANSPORTATION SECTOR SHARE OF EMISSIONS AND REDUCTIONS

Greenhouse gas inventories separate human activity into sectors and quantify emissions accordingly. Nationally, the transportation sector accounts for about 29 percent of the GHG emissions, so emissions reductions strategies that address that sector appear in climate action plans.[3] In fact, as shown in the table below, the transportation sector in many states, such as Washington and California, accounts for greater than 29 percent of the GHG inventory due to low-GHG infrastructure in the electricity sector. Climate plans must account for that as well.

Transportation Sector's Share of State GHG Inventory 2005/2006
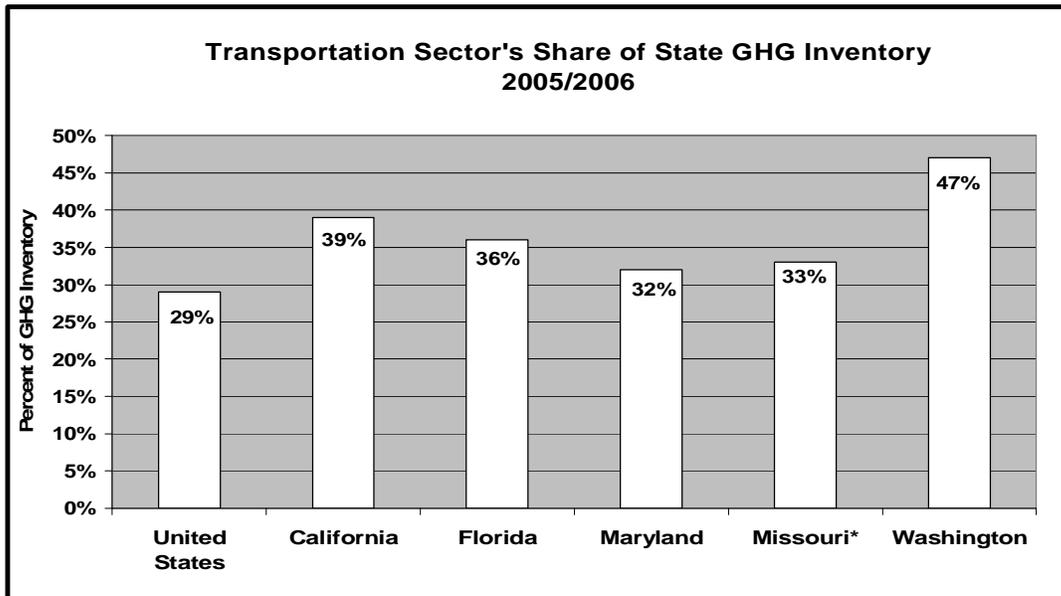
*Missouri data from 1990 inventory

Most climate plans divide the responsibility for reductions among the sectors (including transportation) not solely on the share of emissions but also on an evaluation of the feasibility and cost effectiveness of the various strategies proposed for each sector. The most effective and feasible strategies are selected and the amount of reduction that is expected via implementation informs each sector's targets. Establishing sectoral targets can be controversial because the levels feasibility and cost effectiveness of strategies may be difficult to determine with certainty. Credit for improved vehicle efficiency and fuels can be calculated differently. Targets can also differ from state to state due to unique combinations of demographics, infrastructure and behavior. Within a state there are variations in urban form and demographics, and dissimilar

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[3] United States Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007.* 430-R-09-004. April 2009.

regions might implement different strategies and achieve differing reductions. The table below shows the potential transportation sector contribution envisioned in each state's plan.

Climate Plan Potential Transportation Sector GHG Reductions					
	California	*Florida*	*Maryland*	*Missouri*	*Washington*
Year	*2020*	*2025*	*2020*	*N/A*	*2020*
Transport Sector Reductions as Percent of Total GHG Reductions in State Climate Plan	32.3% (56.2 MMT)	14% (26.54 MMT)	22% (19.5 MMT)	N/A	27.4% (33.5 MMT)

REDUCTION STRATEGY IMPLEMENTATION: RESPONSIBILITY AND ACTIONS

After a climate action plan is completed, governments must develop programs and assign responsibilities for implementing the strategies in the plan. State agencies, Metropolitan Planning Organizations (MPO), local jurisdictions, non-governmental organizations, the private sector and individuals could all be responsible for various actions to reduce GHG emissions. For a plan to succeed, the responsible parties must have the ability to implement the actions for which they are given responsibility. The ability to implement is influenced by funding, authority (legal tools), internal capacity, ability to lead or influence other entities, institutional inertia, external pressures (public, special interests), and balance or conflict with larger mission.

Strategies for reducing the GHG emissions from transportation can be lumped into two broad categories: (1) reducing the average life cycle emissions from each mile an individual motorized vehicle travels, and (2) reducing the demand for miles that the motorized vehicle fleet travels. The first category includes diesel, hybrid and electric vehicles, transportation system efficiency improvements, low carbon and renewable fuels, eco-driving and other strategies dealing with the technology of transportation. The second category includes strategies such as carpooling, teleworking, four day work weeks, shifting trips to transit, walking or biking, trip chaining, land use changes to reduce distances between origins and destinations, travel pricing (which also can have efficiency effects) and other travel behavior strategies. While the second category of strategies may reduce *overall* vehicle miles traveled or the number of miles traveled by a person in a private vehicle, it will not necessarily reduce the number of trips a person takes, the length of trips a person takes, or the person miles traveled (i.e., miles traveled including alternate modes.)

VEHICLE STANDARDS AND FUEL STANDARDS

Government mandated vehicle fuel efficiency and/or GHG standards can have a substantial effect on transportation greenhouse gas emissions. California developed vehicle GHG standards calling for a 30 percent reduction in GHG emissions per mile by 2016, and a Low Carbon Fuel Standard of a 10 percent reduction in motor fuel GHG intensity by 2020. Congress recognized the important role of transportation in the ***Energy Independence and Security Act of 2007***, in which it mandated 35 mile per gallon Corporate Average Fuel Economy (CAFE) standards by 2020 and a roughly 10 percent reduction in the GHG intensity of motor fuels by 2020. In May 2009, President Obama announced motor vehicle GHG and fuel economy standards of 35.5 mpg by 2016, based on negotiations among California, the Federal government and automakers.

Many states have taken steps toward GHG reduction by adopting the California vehicle GHG standards and setting up programs to require or promote alternative energy sources, such as biofuels. All states will need to meet CAFE standards by 2016 but early adopters have a head start on reductions as their vehicle fleets will more quickly replace less efficient cars and trucks.

Vehicle and Fuel GHG Standards						
	California	*Florida*	*Maryland*	*Missouri*	*Washington*	*Nationwide*
Adopted CA Vehicle GHG Standards	yes	yes	yes	no	yes	17 states
Low Carbon/Renewable Fuel Standards	yes	yes	incentives (in progress)	yes	yes	39 states

PROJECTED GROWTH OF VMT

Population growth will steadily increase the amount of motorized vehicle miles traveled even if per capita mileage remains steady. However, VMT per capita actually declined in 2008 on a national basis. It may be too soon to know at what level per capita driving will stabilize, and whether or not it grow again as the economy recovers and vehicles become more fuel efficient.
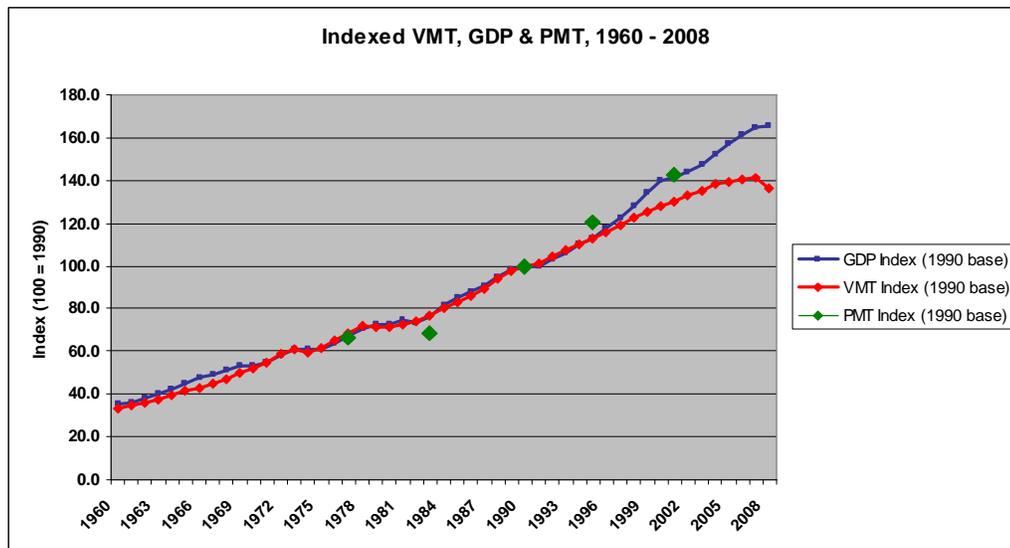
The Energy Information Administration (EIA) estimates that VMT per capita will increase 14% between 2005 and 2030, resulting in an overall 1.5% growth rate in total VMT per year.[4] Assuming this, and expecting even more aggressive requirements than both California and federal standards adopted for vehicle efficiency (55 mpg in 2030) and fuel greenhouse gas intensity (-15% in 2030), GHG emissions from passenger vehicles would be 14% below 1990 levels by 2030. But, to be on track to economy-wide GHG emissions levels of 60-80 percent below 1990 levels by 2050 requires that 2030 GHG emissions be 20-47 percent below 1990

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[3] Energy Information Administration, United States Department of Energy. *Annual Energy Outlook 2009*, Table A7. April 2009.

levels.[5] While VMT growth rates in the future are hard to predict, all five states in this workshop estimate a growth rate in VMT greater than the EIA estimate.

Reported Annual Growth in VMT by State, Indexed
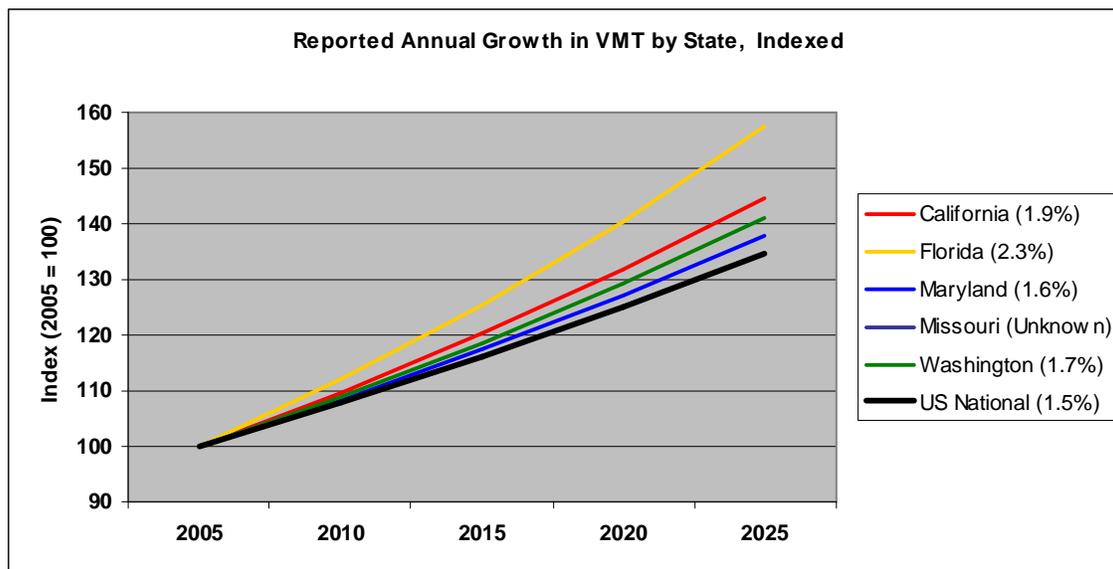
FEDERAL CLIMATE CHANGE AND TRANSPORTATION LEGISLATION

The US House of Representatives passed the nation's first climate change bill in June 2009, *American Clean Energy and Security Act of 2009* (HR 2454). The bill established goals to reduce GHG to approximately 1990 levels by 2020 and calls for a 17 percent reduction below 2005 greenhouse gas levels by 2020 and an 83 percent reduction below 2005 levels by 2050.

Section 222 of the House-passed bill would amend section 841 of the Clean Air Act to include GHG emissions reductions through transportation efficiency and metropolitan planning. More specifically, this section would require states and MPOs to develop surface transportation-related GHG reduction targets, as well as strategies to meet such targets, as part of the transportation planning process. The targets and strategies must:

- Be based on the models and methodologies established in the final regulations required under section 841 of the Clean Air Act;

- Address sources of surface transportation-related greenhouse gas emissions and contribute to achievement of national transportation GHG emissions reduction goals;

- Include efforts to increase public transportation ridership; and

- Include efforts to increase walking, bicycling, and other non-motorized transportation.

The Senate is currently drafting their own climate bill, working from the House bill. The draft bill may be released as early as the end of September. The Senate Committee on Environment

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[5] This target level assumes equal reductions from all sectors. From a cost-effectiveness standpoint, it is likely that those sectors with cheaper reductions would achieve greater relative reductions. It is also likely, given the deep reductions required, that major efforts will be required from all sectors of the economy – including transportation.

and Public Works appears to be considering how to incorporate elements of other proposed climate and transportation legislation into the text of the House bill. For example, Senator Carper introduced his "CLEAN-TEA" bill in March. That bill would establish revenue sources for metropolitan planning through a "Low Greenhouse Gas Transportation Fund" and dedicate 10 percent of carbon cap-and-trade revenue for transportation GHG-reducing efforts, including transit, transit-oriented development, and cycling and pedestrian improvements.

Appendix B

Participating State Summaries

California Summary

Unique Elements

California faces even greater challenges than the United States in reducing greenhouse gas emissions with the transportation sector accounting for approximately 38 percent of the total GHG inventory in the state; further, light duty trucks/cars and on-road freight account for roughly 65 percent of GHG emissions within the transportation sector[6]. Between 1990 and 2005, the transportation sector's greenhouse gas contribution in the state grew at a rate 1.4 times that of overall GHG emissions in the United States, and 1.9 times that of the overall GHG emissions in California[7].

Establishing Laws & Regulations
California has led the nation in developing statewide climate change legislation for sector-wide greenhouse gas reduction goals, vehicle technology standards, low carbon fuels, and an integrated metropolitan land use and transportation planning framework. Under California's *Global Warming Solutions Act,* the California Air Resources Board (CARB) used statewide fuel sales data from Board of Equalization and federal fuel use data to establish a 1990 GHG inventory to determine their economy wide GHG 2020 target. Opportunities for added data include the use of existing odometer data from the Bureau of Automotive Repair and Department of Motor Vehicles to aggregate to zipcode level for use by CARB and availability to local and regional governments. California's vehicle and fuel standards have been adopted in other states and modeled at the national level. California is also the only state currently requiring GHG targets be set for Metropolitan Planning Organizations (MPO) through their Regional Transportation Plan (RTP) process. This new requirement includes:

- GHG targets set by CARB and the Regional Targets Advisory Committee for the automobile and light truck sector for 2020 and 2035 through transportation system efficiency and strategies to reduce VMT.

- A "Sustainable Communities Strategy" (SCS) as the land use allocation of the MPO's RTP to plan for how they will achieve their given GHG target.

- An "Alternative Planning Strategy" (APS) may be created if an MPO cannot meet their GHG target through the development of an SCS. The APS would detail additional measures that the MPO *could* take to achieve the target given other circumstances.

- A provision to allow any residential or 75% residential mixed-use project that is consistent with *either* the SCS or APS to be exempt from: 1) growth inducing impacts; or 2) any project specific or cumulative impacts from cars and light-duty

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[6] California Air Resources Board, State of California. *AB 32 Climate Change Scoping Plan.* December 2008.
[7a] California Air Resources Board, State of California. *Greenhouse Gas Inventory Data: 1990-2004.* November 2007. http://www.arb.ca.gov/cc/inventory/archive/archive.htm. Accessed 15 July 2009.
[7b] California Air Resources Board, State of California. *Greenhouse Gas Inventory Data: 2000-2006.* May 2009. http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed 15 July 2009.

truck trips generated by the project on global warming or the regional transportation network.

- The alignment of the update cycles for the Regional Housing Needs Assessment and Regional Transportation Plans.

- *No changes made to approval or funding of transportation and development projects.*

Implementation

Another unique aspect of California's climate change process has been the implementation approach initiated through the Office of the Attorney General. On August 21, 2007 California Attorney General Jerry Brown announced a "landmark settlement" of the State of California's climate change lawsuit against the adequacy of San Bernardino County's General Plan in analyzing the effects of development on greenhouse gas emissions under the California Environmental Quality Act.[8] The agreement included three major provisions through an intensive public process aimed at cutting GHG emissions attributable to land use decisions and County government operations: 1) an inventory of all known sources of GHG emissions in the County; 2) an inventory of GHG emissions levels for 1990, current year, and projected for 2020; and 3) a target for the reduction of emissions attributable to the county's discretionary land use decisions and its own internal government operations. One year later in September 2008, the Office of the Attorney General set another landmark agreement with the City of Stockton requiring the City to identify and reduce GHG emissions by encouraging downtown growth, constructing thousands of new residential units within its current city limits, developing a rapid transit bus system and requiring all new buildings to be energy efficient[9]. Similar to the San Bernardino case, the City of Stockton will be developing an inventory of GHG emissions levels for 1990, current year, and projected for 2020.

Funding Structure

While infrastructure for new developments was largely financed by broad-based taxes before 1978, the passage of Proposition 13 shifted funding sources to development impact fees as a way of internalizing the costs of the new infrastructure and service needs[10]. One response to Proposition 13 is the growing number of California counties that have approved local transportation sales taxes to fund transportation projects. Over the last 25 years, voters in 20 California counties passed such a tax – generating approximately $2.5 billion per year in total for roadway and/or transit projects[11]. The State of California also provides some revenue for transportation projects to local government through the Transportation Investment Fund (TIF), which funds capital projects that are on and off the state highway system and listed in the State Transportation Improvement Program (STIP) – a plan that allocates 25 percent of TIF funding to the Caltrans and 75 percent to MPOs. Proposition 1B in 2006 provided approximately $20

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[8] *California Office of the Attorney General.* Brown Announces Landmark Global Warming Settlement. *21 August 2007.* *http://ag.ca.gov/newsalerts/release.php?id=1453 Accessed 27 August 2009.*

[9] *California Office of the Attorney General.* Attorney General Brown Forges Greenhouse Gas Reduction Agreement With City of Stockton. *09 September 2008.* *http://ag.ca.gov/newsalerts/release.php?id=1608 Accessed 27 Aug 2009.*

[10] Chapman, Jeffrey. *Proposition 13: Some Unintended Consequences.* Public Policy Institute of California. 1998. http://www.ppic.org/content/pubs/op/OP_998JCOP.pdf. Accessed 10 July 2009.

[11] Crabbe, A., Rachel H., Susan P., Martin W.. *Local Transportation Sales Taxes: California's Experiment in Transportation Finance.* 19 February 2005. http://www.uctc.net/papers/737.pdf. Accessed 10 July 2009.

billion for transportation projects. Congestion reduction, highway and local road improvements received 56 percent of the total funding, while public transportation received 20 percent[12]. Additionally, Proposition 1C provided $2.85 billion for a variety of housing and development programs, including $850 million for the Regional Planning, Housing, and Infill Incentives Account and $300 million for the Transit Oriented Development Account.

Key Plans and Legislation

In response to the impacts of climate change, and the growing GHG contribution from transportation-related emissions, the State of California set forth a series of legislative actions to promote a low-carbon economy:

- *Assembly Bill 1493 – Pavley, Chapter 200, Statutes of 2002*: Signed in 2002, Pavley required a 30% reduction in GHG's by 2016 and became the first vehicle greenhouse gas legislation in the United States.

- *"Low Carbon Fuel Standard"*: Regulation in 2006, requiring oil companies to reduce the life-cycle GHG emissions from transportation fuels 10 percent by 2020.

- *Executive Order S-3-05*: Governor Schwarzenegger issued an executive order in 2005 to establish a goal of reducing greenhouse gases by 80% below 1990 levels by 2050.

- *Assembly Bill 32 – Global Warming Solutions Act*: Passed in 2006, AB 32 called for a reduction in GHG emissions to 1990 levels by 2020. This law also addressed economic objectives, stating: "The state board shall evaluate the total potential costs and total potential economic and noneconomic benefits of the plan for reducing greenhouse gases to California's economy, environment, and public health, using the best available economic models, emission estimation techniques, and other scientific methods." Under AB 32, the State established a Climate Action Team (CAT) to guide the development of the *Climate Change Scoping Plan.* The CAT included subgroups for the Land Use Subgroup of the Climate Action Team (LUSCAT).

- *Senate Bill 97 – California Environmental Quality Act (CEQA) Guidelines:* In 2007, the Governor's Office of Planning and Research (OPR) and the Natural Resources Agency were tasked with updating the CEQA Guidelines to provide assistance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents.

- *Senate Bill 375 – Sustainable Communities and Climate Protection Act of 2008*: Passed in September 2008, SB 375 requires GHG targets to be set for MPOs under an integrated land use and transportation planning framework.

- *Senate Bill 732 – Strategic Growth Council:* Signed into law September 2008, the Strategic Growth Council will assist state and local entities in the planning of sustainable communities and meeting AB 32 climate change goals.

- *Assembly Bill 842:* Signed September 2008, AB 842 requires the Department of Housing and Community Development, when ranking applications for funding under the Infill

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[12] Legislative Analysts Office. *Proposition 1B: Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006.* November 2006. http://www.lao.ca.gov/ballot/2006/1B_11_2006.htm Accessed: 12 July 2009.

Incentive Grant Program and the Transit Oriented Development Implementation Program, to award preference or priority to projects located in areas where the local or regional entity has adopted a general plan, transportation plan, or regional blueprint that will reduce the *growth* of VMT by at least 10%, and the project is consistent with that planning document.

Environmental Review Framework

The California Environmental Quality Act (CEQA) was passed in 1970 in response to the National Environmental Policy Act (NEPA). CEQA supplemented NEPA with a more aggressive environmental review statute, which requires state and local agencies to identify the significant environmental impacts of their actions and avoid or mitigate those impacts if feasible. Most proposals for physical development in California are subject to the provisions of CEQA, as are many governmental decisions which do not immediately result in physical development (such as adoption of a general or community plan). Every development project which requires a discretionary governmental approval will require at least some environmental review pursuant to CEQA, unless an exemption applies.[13] In addition, state law requires each city and county to adopt a general plan containing the seven elements: land use, circulation, housing, conservation, open-space, noise, and safety (Government Code Sections 65300 et seq.)[14].

Best Practices

- **General Plan Guidance**: OPR is in the process of updating the 2003 General Plan Guidelines to provide guidance to cities and counties in the preparation of local general plans -- the next edition will reflect legislative requirements enacted since 2003 (AB 32, SB 375, SB 97) and new guidance on addressing climate change.

- **Smart Mobility**: Caltrans and the US Environmental Protection Agency are in the process of developing an applicable planning tool that assesses how well plans, programs, and projects meet a definition of "smart mobility", which will be used to assess how well products meet "smart mobility" principles of system efficiency and demand reduction.

- **Regional Transportation Plan (RTP) Guideline Update:** The California Transportation Commission is updating guidelines per SB 375 to make RTPs internally consistent.

- **Complete Street Guidelines:** Caltrans implemented Deputy Directive 64 in October 2008 stating that "the Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system."

- **California Regional Blueprint Planning Program**: Caltrans' voluntary, discretionary, grant program for metropolitan integrated land use and transportation planning.

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[13] State of California, Natural Resources Agency. http://ceres.ca.gov/ceqa/more/faq.html. 2007. Accessed 27 August 2009.
[14] State of California, Governor's Office of Planning and Research. *A Guide to Planning in California.* August 1990 http://ceres.ca.gov/ceqa/more/tas/Planning_Guide.html#intro Accessed 27 August 2009.

Barriers to implementing GHG reduction actions

- CEQA interpretation/guidance for GHG impacts related to vehicle level of service
- Conflicts between climate change laws and General Plan consistency requirements
- Funding for system efficiency improvements.
- Funding for local jurisdictions (fiscalization of land use; developer impact fees).
- Local project opposition.

Florida Summary

Unique Elements

Florida passed a growth management act in 1985 that authorizes the Department of Community Affairs, Division of Community Planning, to review comprehensive plans and plan amendments for compliance with the Act.[15] **Comprehensive plans must contain "elements" covering land use, housing, transportation, infrastructure, coastal management, conservation, recreation and open space, intergovernmental coordination, and capital improvements. The law also included a "concurrency" provision that requires facilities and services to be available concurrent with the impacts of development. Communities can generally amend their comprehensive plans only twice per year.**

Key Plans and Legislation

- **Climate Change Summit resulted in three Executive Orders in 2007 that established state GHG reduction targets and a Governors Action Team charged with preparing a Climate Plan.**

- **Climate Plan completed in 2008. Also HB7135, Energy bill that requires GHG emissions be considered in MPO plans. HB 697, Building Code Standards, contains provision requiring local comprehensive plans land use elements to discourage sprawl and include GHG reduction strategies, transportation elements to reduce GHG.**

- **In 2009: HB 5013 created the Energy Economic Zone Pilot Program. SB 360, Community Renewal Act, which alters some aspects of the Florida Growth management Act including exempting dense urban land areas from state transportation concurrency requirements. It also directs FDOT and DCA to develop a uniform mobility fee that could replace the existing transportation concurrency system.**

Environmental Review Framework

Relevant projects with a federal connection must follow federal NEPA regulations as well as state permitting regulations. For projects exempted from federal actions, environmental evaluations are required (by FDOT policy) on all major transportation projects using non-federal funds (bonds, local, state, and/or private monies) which meet any of the following qualifying conditions: 1) is part of the State Highway System (including the Florida Turnpike); 2) is a Toll project under 338.251, F.S.; or 3) is a privately funded major project under 334.30, F.S.

Florida transportation projects take a very long time to go through the permitting process - currently the average time to complete an Environmental Impact Statement is 60 months. FDOT is working to shorten this time period in anticipation of a wealth of additional projects in the near future. In addition, FDOT has established the Efficient Transportation Decision Making (ETDM) process to provide earlier identification of potential impacts of proposed

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[15] http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=Ch0163/part02.htm&StatuteYear=2009&Title=-%3E2009-%3EChapter%20163-%3EPart%20II

projects on the natural, cultural and human environment. This early information helps guide the transportation decision-making process (e.g., deciding which projects should move forward in the planning process, modifying a project to avoid or mitigation potential impacts).

Best Practices

Florida DOT is engaged numerous activities that are supportive of reduced GHG goals as well as other goal overlapping goals and priorities.

- System efficiency actions include traveler information systems, improved incident response and construction zone management, improved signal timing and spacing, bottleneck relief, electronic tolling and use of roundabouts.

- Demand reduction activities include numerous regional visioning plans, carpooling and telecommuting grants, alternative modes funding assistance, pilot pricing strategies, encouraging freight rail and the review of local comp plan amendments

Barriers to implementing GHG reduction actions

- Implementing regional commuter rail (e.g., getting legislative approval for Sun Rail and funding for other commuter rail initiatives in Florida such as Tampa Bay, Jacksonville).

- Operational funding for Tri Rail commuter rail (i.e. dedicated funding source).

- How to implement the state law (Ch. 163, F.S.) requiring local government comprehensive plans to include energy efficiency land use patterns and GHG emissions reduction strategies (including those from the transportation sector).

- Due to sprawl and several emerging mega regions, coordinated efforts will be needed and a challenge to establish centers and transit oriented development, including supportive densities and intensities of use.

- The limited role of transportation agencies (state and MPOs) in local land use and transit investment decisions.

- Florida will continue to be a growth state, which means VMT will continue to grow. VMT is also affected by tourism, a major component of Florida's economy.

- Lack of funding for capacity improvements and the backlog of unmet needs, but could also be viewed as an opportunity to revisit how transportation is funded. May be made worse by people driving less and using more fuel-efficient vehicles.

- Need to have a reliable and consistent methodology for measuring GHG baselines and projections among state, regional and local governments.

- Uncertainty about how to incorporate GHG considerations into review of proposed projects (e.g., STIP, TIP).

- Obtaining reliable statewide information on projected sea level rises (including timing) for evaluating potential impacts on transportation infrastructure and adaptation needs.

Maryland Summary

Unique Elements

Maryland passed planning legislation in 1992, followed by Smart Growth legislation in 1997 that directed state funding to priority smart growth areas.

Key Plans and Legislation

- The Maryland Climate Change Commission was established in 2007 and released their Climate Action Plan in 2008.

- National Capitol Region Climate Change Report adopted by MWCOG Board of Directors in 2008 includes regional GHG targets.

- The Greenhouse Gas Emissions Reduction Act passed in 2009. It set a target for 2020. It also requires the state to adopt a plan by 2012 to meet the target. Plan must ensure a net economic benefit. The lead agency for the plan is the Maryland Department of the Environment. MDOT is working to evaluate the range of transportation policy options and to define specific programs, actions and strategies to address the mitigation policy options for the plan.

Environmental Review Framework

Maryland has a "little NEPA," requiring assessment of major proposed agency impacts on the environment. The Maryland Environmental Policy Act (MEPA) requires state agencies to prepare environmental effects reports for each proposed state action that significantly affects the quality of the environment. (Md. Code Ann., Nat Res. 1-301 et seq.) Maryland has worked with FHWA to streamline the environmental review process for highways. Growth-related projects covered by the legislation include most State programs that encourage or support growth and development such as highways, sewer and water, which must protect the environment and agricultural lands, and direct growth to existing developed areas. Local governments must have comprehensive plans, and legislation passed in 2006 expanded requirements for plans.

Best Practices

While still evaluating the many strategies in the climate plan, MDOT is currently involved in a number of initiatives that support reducing GHG as well as overlapping departmental goals.

- System efficiency actions underway include ITS to reduce idling delay, truck stop electrification, traffic signal synchronization and school bus idling restrictions

- Demand reduction activities underway include park and ride lots, guaranteed ride home program, ridesharing to promote HOV lane use, and telework promotion.

Barriers to implementing GHG reduction actions

- No coordinating authority to direct climate efforts within the state. Provision for MDOT input was poor during climate plan development process.

- Federal funding not in alignment with VMT reduction goals. Lack of funding overall at all levels of government.

- Economic impact of measures could be problematic during current recession. Economy also affects funding opportunities and public acceptance of increases in taxes or costs. Economic competitiveness effects must be considered if Maryland adopts policies more stringent than neighboring states.

- Local land use control difficult to influence, lack of incentives and disincentives.

- Public education needed as well as political willingness.

- An extremely ambitious time-line has been allocated to complete the development of reduction strategies to help meet the GHG goals in the Climate Change Plan. The sectors (mobile and non-mobile) have been given 8-9 months to determine how they are going to meet the Climate Change Commission's emission reduction requirements.

- Lack of uniform federal direction regarding GHG requirements

- State lacks primary control of land use.

Missouri Summary

Unique Elements

Missouri is a largely rural state characterized by lower residential and commercial densities, even in the larger cities. Rural transportation GHG strategies are a particular challenge for the state. Missouri does not require municipalities to adopt a comprehensive land use/transportation plan.

Key Plans and Legislation

- The Missouri Department of Natural Resources (DNR) completed an emissions inventory in 1996. A projection of future emissions through 2015 was completed in 1999.

- In 2002, Missouri DNR published a report titled "Missouri Actions Options to Reduce Greenhouse Gas Emissions" that outlined potential GHG reduction strategies. The report did not attempt to quantify the reduction potential from the strategies.

- The Renewable Fuel Standard (MoRFS), passed in 2006 and effective in 2008, requires all gasoline sold in the state contain 10% ethanol by volume, subject to certain restrictions.

- The City of Kansas City issued their Climate Protection Plan in July 2008. The plan calls for a 30% reduction in City-wide GHG emissions below 2000 levels by 2020, and an 80% reduction in City-wide GHG emissions below 2000 levels by 2050.

Environmental Review Framework

The State of Missouri does not have a unique, state-specific environmental review process. Relevant projects with a federal connection must follow federal NEPA regulations. Missouri does not have a strong state role in land use planning. Despite this, metropolitan areas tend to have high levels of growth management coordination and planning.

Best Practices

Missouri has emphasized system efficiency in their effort to reduce environmental impacts, implementing ridesharing, the bi-state Intelligent Transportation Systems (ITS) in both St. Louis and Kansas City, a regional 511 Traveler Information system in St. Louis and in development in Kansas City, and a bi-state traffic signal coordination system in Greater Kansas City.

The City of Kansas City's Climate Protection Plan has adopted a number of transportation strategies to achieve GHG reductions:

- Reduce GHG and VMT through provision of alternative transportation modes, with a strong focus on walking and bicycling

- Develop a signal coordination and traffic flow plan

- Adopt "Complete Streets" principles that consider other modes of transport beyond the private vehicle during facility reconstruction

Barriers to implementing GHG reduction actions

- Statewide Planning Capacity & Leadership – Plans across different state agencies are not integrated and the state does not have a comprehensive statewide capital investment strategy. Many local governments in the state do not undertake comprehensive land use/transportation planning. Where they exist, state, regional and local plans need to be better aligned.

- Strengthened Energy/Climate Strategy, Develop Metrics that Measure Progress – Missouri's current strategic goals need to become increasingly focused on effective and affordable carbon reductions and to more formally imbed them in plans, policies and project development at state, regional and local levels.

- Large Rural Population & Transportation Dependent Economy – Missouri is a relatively low-density state, even in its urban areas, making it difficult to pursue strategies such as transit. The state's economy is largely transportation dependent, including agriculture, logistics and distribution, and manufacturing, making reductions in transportation use challenging from an economic standpoint.

- Different approaches from the statewide and metropolitan perspectives on transit as a strategy to reduce GHG – For the State of Missouri as a whole doubling public use of mass transit would increase travel for that mode from 1.5 percent to 3 percent. Although urban centers in Missouri need transit as a strategy, it is not a strategy that will gain large reductions in VMT for the state as a whole.

Washington Summary

Unique Elements

With HB 2815 in 2008 Washington became the only state that has set statewide VMT targets through legislation. Under a subsequent Executive Order, WSDOT is now working with the larger MPOs to ensure that their regional transportation plans will achieve the VMT targets when implemented.

Plans and Legislation

- Executive Order 07-02 established statewide GHG reduction goals.

- SB 6001, signed in 2007, set into law statewide GHG emission reduction goals and strategies originally announced in the executive order.

- Department of Ecology released Climate Plan in 2008.

- HB 2815, signed in 2008, made Washington the first state to set specific targets for reducing the amount of vehicle miles. Prior to implementation a report must be made of the anticipated impacts on small businesses, low income residents and others. GHG targets are part of the State Clean Air Act, which ensures that all existing tools can be used for implementation and enforcement.

- Executive Order 09-05 directs WSDOT to evaluate VMT estimates and targets by 2010. Also directs them to work with four largest MPOs to develop RTPs that will achieve the statutory benchmarks.

Environmental Review Framework

The State Environmental Policy Act (SEPA) provides a way to identify possible environmental impacts that may result from governmental decisions. SEPA applies to decisions by every state and local agency within Washington State, including state agencies, counties, cities, ports, and special districts. WA Rev Code Sec: 43.21C.010 - 43.21C.910. In addition to environmental review, Washington has had a strong state planning process since 1990. In Washington, not all counties have to follow this review process completely. The Growth Management Act requires all counties to establish urban growth areas, and comprehensive plans must include "elements" covering land use, housing, capital facilities, utilities, transportation, and, for counties, a rural element.

Best Practices

- WSDOT is engaged in programs to increase the GHG efficiency of transportation systems including participation in the West Coast electrification corridor project and the Construction Traffic Management Program,

- The region has prioritized high speed transit including Sound Transit and the Cascade high speed rail corridor.

- WSDOT has many programs already in place that reduce GHG and VMT including the Commute Trip Reduction Program, Growth and Transportation Efficiency Center Program, Vanpool Investment Program (largest program in the country - eliminated 203 million drive-alone miles statewide in 2008), Trip Reduction Performance Program, Park and Ride Program, Regional Mobility Grant Program, Kitsap County Telework Pilot Program, Safe Routes to Schools Program, High Occupancy Vehicle and High Occupancy Tolling Program, Variable Tolling and Bicycle and Pedestrian Program

- DOT addresses climate change and GHG in project-level environmental documents

Barriers to implementing GHG reduction actions

- Public belief in climate change and the public's role in shaping the outcome. Communicating the issues in non-threatening language, building political will.

- Funding based on the gas tax conflicts with goal to reduce gas consumption.

- Measurement and modeling capacity.

- Direction given to state agencies but local government is the implementer.

- Disconnect between transportation and land use planning and between regional planning and local implementation of plans.

- Determining regional fair share of state GHG and VMT reduction benchmarks.

- Lack of incentives and disincentives.

- Lack of federal guidance on how to address project level GHG emissions.

- The dynamic nature of climate change science and the expectation that best practices may change.

- Balancing climate change issues with other environmental and social goals.

Appendix C

State Goals and Targets

Historic Timeline for State Policy Actions

Future Timeline for State Policy Actions

Historic VMT vs GDP Graphs for Five States

GOALS AND TARGETS   legend: *goal in climate plan*   **target in executive order or legislation**

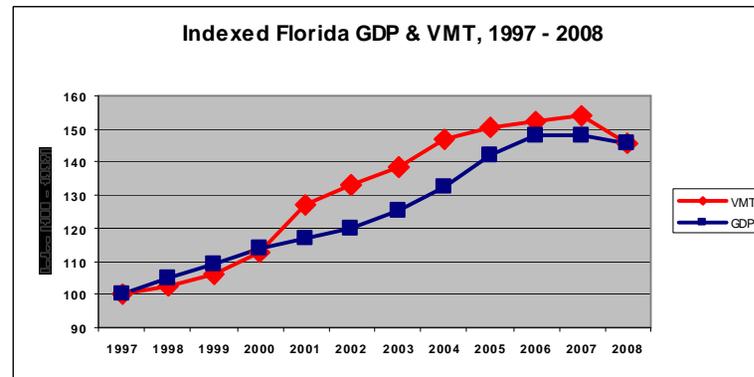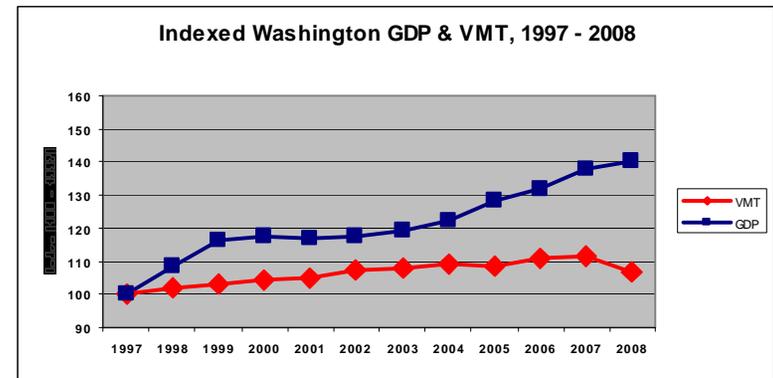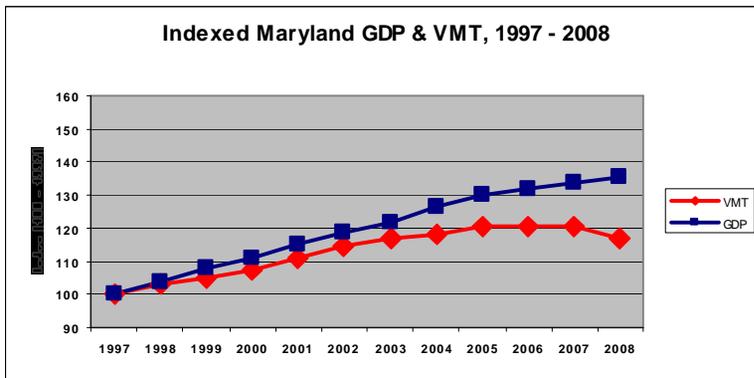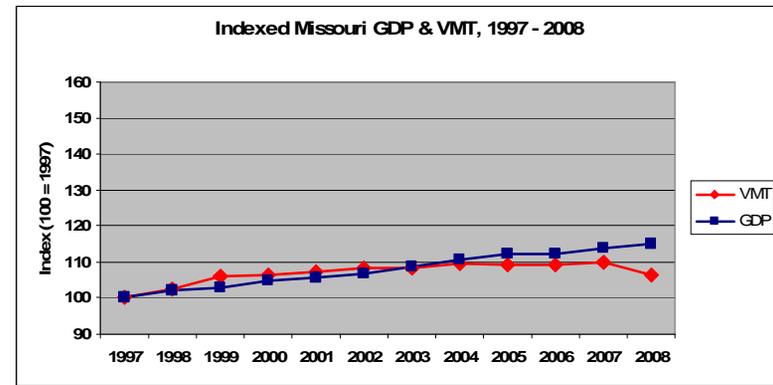|	California	Florida	Maryland	Missouri	Washington
Overall GHG	**Executive Order S-3-05 80% below 1990 by 2050** **AB 32 GHG to 1990 levels by 2020;**	**Exec Order 07-127 2000 levels by 2017 1990 levels by 2025 80% below 1990 by 2050**	*from 2006: 10% by 2012; 15% by 2015; 25-50% by 2020; 90% by 2050* **SB 278 25% below 2006 by 2020 (=4% below 1990)**		**GHG reduction to 1990 levels by 2020; 25% GHG reduction below 1990 levels by 2035; 50% below 1990 levels by year 2050**
Transportation GHG	**SB 375 MPO GHG targets to be determined by RTAC recommended ARB process**				
VMT			*VMT to 2000 per capita levels by 2020 continuing reductions in per capita VMT (excluding commercial freight activity) of 30 per cent by 2035 and 50 per cent by 2050 from a 2020 baseline.*		**18% VMT/capita reduction below business-as-usual projections by 2020; 30% by 2035; 50% by 2050**
Vehicle GHG	**Pavley Bill Calif Vehicle Stds (2002)**	**Exec Order 07-127 Calif Vehicle Stds (2007)**	**Clean Cars Act Calif Vehicle Stds (2007)**		**HB 1397 Calif Vehicle Stds - (2005)**
Fuels	**10% ethanol by December 31, 2009. *Enacted June 2007***	**HB 7135 10% ethanol by 2010**	**Senate Bill 740, "The Renewable Fuels Act of 2005"**	**10% ethanol by 2008. Enacted July 2006**	**2% ethanol by 2008 10% if no pollution levels 2% biodiesel by 2008. 5% if sufficient in-state biodiesel production. *Enacted July 2006***

Historic Timeline for State Policy Actions

	2005 and earlier	2006	2007	2008	2009 done
California	established overall emissions targets (exec); passed Pavley std 2002	AB 32 - mandated overall emissions targets	completed Early Action Plan	approved AB 32 Scoping Plan; passed SB 375 - land use planning linked to GHG reduction	
Florida			EO 07-126- state agency GHGs; EO 07-127 - statewide GHG targets; EO 07-128 - create team to develop Climate Plan; adopted CA GHG std	completed Climate Plan; adopted HB 7135 - MPOs and address GHG; HB 697 - local comp plans address GHG	HB 5013 - Energy Economic Zone pilot; SB 360 - replacement for concurrency, affects env review
Maryland			Joined Regional Initiative; Clean Cars Act (California GHG Pavely Standard)	completed Climate Plan	SB 278 - mandated 2020 target; MDOT Implementation Strategy work plan begun;
Missouri	Action Options Plan 2002				
Washington	adopted CA emission std 2005		EO 07-02 - GHG and jobs targets; SB 6001 - targets adopted as law	completed Climate Plan; HB 2815 - targets for GHG and VMT	EO 09-05 - WA DOT to evaluate VMT targets, work with MPOs to achieve targets

Future Timeline for State Policy Actions

	2009 future	2010	2011	2012	2015
California	RTAC recommends methodology for regional SB 375 targets	set regional SB 375 targets		Rules and policies to implement Scoping Plan developed & implemented	
Florida	Establish growth policies that provide incentives for regional visioning	Amend FTP goals, objectives and strategies to address climate change, reduce GHG and provide modal alternatives			Plan to see funding for relieving freight bottlenecks
Maryland	First Annual Report of Climate Change Commission due Nov.; Phase II MDOT strategy-quantitative analysis and refinement		Department of Environment shall submit a plan to reduce 25% from 2006 by 2020	adopt final plan to reduce 25% below 2006 by 2020	adopt final plan to reduce 25% below 2006 by 2020
Missouri					
Washington			Wash DOT report to Governor on MPO progress and barriers		

Historic VMT vs GDP graphs for five states

Indexed California GDP & VMT, 1997 - 2008

Indexed Missouri GDP & VMT, 1997 - 2008

Indexed Maryland GDP & VMT, 1997 - 2008

Indexed Washington GDP & VMT, 1997 - 2008

Indexed Florida GDP & VMT, 1997 - 2008
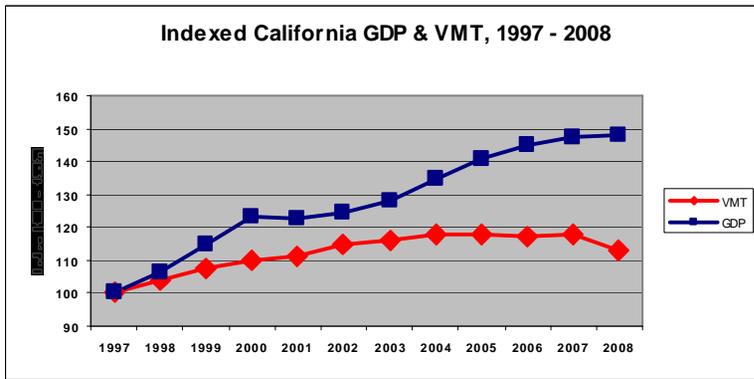
Source: Bureau of Economic Analysis, U.S. Department of Commerce; FHWA, U.S. Department of Transportation

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