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N°05/11 – DECEMBER 2011 I URBAN FABRIC

Urban Smart Growth Strategy in California

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CALIFORNIA AT THE FOREFRONT OF AMERICAN CLIMATE POLICIES

In 2006, California took the lead in the USA by passing the first global warming legislation, aiming at decreasing its GHG emissions to 1990 levels by 2020. Two years later, in September 2008, the California state legislature passed the nation's first state law (Senate Bill 375) to include land use policies directed at curbing urban sprawl and reducing automobile travel. The legislature recognized that cleaner fuels and more fuel-efficient vehicles would not be sufficient to achieve the state's goal of reducing GHG emissions.

ACHIEVING MORE EFFICIENT LAND USE AND TRANSPORTATION

The SB 375 law requires that regions develop "Sustainable Communities Strategies" (SCS) to achieve more efficient land use and transportation by aligning some planning processes that had traditionally been disconnected. Rather than imposing a state-controlled planning system, SB 375 establishes a regional coordinating process for transportation investment and land use plans. SB 375 adopts a comprehensive "stick and carrot" approach with obligation such as the strengthened social housing obligations for cities and counties or the obligation to integrate a "smart growth" component in Regional Transportation Plan, but also with environmental review or transportation funding incentives.

A FIRST STEP TOWARDS A SIGNIFICANT ALTERATION OF URBAN DEVELOPMENT?

To what extent can the Californian law SB 375 integrate transport and land use planning and reduce transportation GHG emissions? The administrative relief is weak and does not bring a significant incentive. There is no additional fund for transit or planning and the lack of coordination with other policies remains a key issue. Finally, there are no Monitoring Reporting and Verification (MRV) procedures to ensure the effectiveness of the process. The enforcement of SB 375 rely on direct citizen action—the so-called "citizen enforcement". However, SB 375 is clearly a relevant first step and a significant alteration of urban development trajectory. As it created a consensus on the necessity to implement "smart growth" approach, SB 375 set the basis for an informed discussion among stakeholders and brought the long-term issue into the Californian mitigation strategy.

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Citation: Lefèvre, B., 2011. *Urban Smart Growth Strategy in California*, Studies N°05/11, IDDRI, Paris, France, 74 p.

This research was conducted in partnership with the Department of City and Regional Planning and the Global Metropolitan Studies Program at the University of California, Berkeley.

This research was funded by Veolia Transport

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ISSN 2258-7535

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INTRODUCTION

In 2006, California took the lead in the USA by passing the first global warming legislation: the Global Warming Solutions Act or Assembly Bill 32 (AB 32). The legislation requires California to decrease GHG emissions to 1990 levels by 2020 (approximately a 27% reduction) using an enforceable statewide target to be phased in beginning in 2012. In addition, in 2005 Governor Schwarzenegger issued Executive Order S-3-05, which charges California with the task of reducing GHG emissions to 2000 levels by 2010, reducing emissions to 1990 levels by 2020, and reducing emissions to 80% below 1990 levels by 2050. The California Air Resources Board (ARB), which is charged of implementing the target, was required to adopt the legislation by January 1, 2008, and to develop a plan for reducing emissions by January 1, 2009. Those actions that can be enforced early will be adopted in 2010, and the rest of the measures will be adopted in 2011.

In the United States, transportation results in over 27% of anthropogenic GHG emissions, and in California, 41% of GHG emissions are due to transportation (Shaheen and Lipman, 2007; ETAAC, 2008). Transportation uses over half of California's oil supply (McManus, 2007). Meanwhile, the average fuel economy of new vehicles has decreased due to increased proportions of light-duty trucks and sport utility vehicle (SUV) purchases (duVair *et al.*, 2002). In California, the rate of vehicle miles traveled (VMT) growth proportionately exceeds population growth (LUSCAT, 2008). Improved standards of living increase the demand for vehicle ownership and for international trade, which increases freight transportation in California (ETAAC, 2008). Longer commute distances also have contributed to increases in VMT, while congestion has continued to increase; both factors contribute to GHG emissions (ETAAC, 2008).

In September 2008, the California state legislature passed the first state law (Senate Bill 375) to include land use policies directed at curbing urban sprawl and reducing automobile travel as part of the state's ambitious strategy to reduce greenhouse gas (GHG) emissions. The legislature recognized that cleaner fuels and more fuel-efficient vehicles would not be sufficient to achieve the state's goal of reducing GHG emissions to 1990 levels by 2020. The bill requires the state's 18 metropolitan planning organizations to include the GHG emissions targets established by the state Air Resources Board (ARB) in regional transportation plans, and to offer incentives for local governments and developers to create more compact developments and provide transit and other opportunities for alternatives to automobile travel to help meet these targets. Through the SB 375 process, regions will work to integrate development patterns and the transportation network in a way that achieves the reduction of greenhouse gas emissions while meeting housing needs and other regional planning objectives. The main objective is to integrate four unsynchronized planning processes: land-use planning, transportation planning, housing development and reduction of greenhouse gas emissions. ARB currently estimates that reductions in vehicle miles traveled (VMT) resulting from these actions will contribute only about 3% of the 2020 targets—an estimate that reflects uncertainties in the state of knowledge about the impacts of more compact development patterns on travel and the short time horizon involved. This small share reflects the time frame of the Scoping Plan. Changes to land use and transportation infrastructure such as envisioned in SB 375 take a long time to implement. The technology related strategies are expected to produce more immediate effects. However, CARB also recognizes that over the long run, the SB 375 component will be increasingly important for achieving emissions reductions.

Land use planning and urban growth decisions are areas where successful implementation of the Scoping Plan relies on local government. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth and the changing needs of their jurisdictions. The SB 375 law requires that regions (through regional planning organizations, in cooperation with local governments) develop "Sustainable Communities Strategies" to achieve more efficient land use and transportation by aligning some planning processes that traditionally had been disconnected. However, SB 375 does not require that local governments comply with the Sustainable Communities Strategies nor does it redirect or create new funding sources to support sustainable planning practices or projects.

However, SB 375 dramatically changes California's approach to land use planning by creating regional GHG targets that link land use to transportation planning. SB 375 is the nation's first law to control greenhouse gas emissions by curbing sprawl. By passing SB 375, California became the first state to legislatively link predefined greenhouse gas (GHG) emission reduction goals to physical growth patterns in metropolitan regions. Rather than imposing a topdown, state-controlled planning system, SB 375 establishes a regional coordinating process for transportation investment and land use plans. The law's major procedural change is a requirement that existing planning processes be more closely aligned. The SB 375 process relies on existing organizations and leaves most fundamental aspects of state and local planning processes intact. Because SB 375 relies heavily on current planning practices, its strengths and weaknesses also flow from these arrangements.

This research attempts to assess to what extent the Californian lax SB 375 can integrate transportation and land use planning and so, reduce transportation GHG emissions. We explore the promises and the challenges of this new Californian smart growth strategy. We analyze the design of the law and the reasons of it. We assess various key institutional, financial, economic, technical barriers that SB 375 's implementation will face. And we attempt to evaluate its capacity to overcome them.

First, we present and discuss the main provisions of SB 375 (section 1). Then, we analyze the multilevel governance framework in which the law is implemented (section 2). Standing back in order to understand why SB 375 was designed as it is, we analyze the history of its elaboration and how the law emerged from the "policy soup" (section 3) and we describe how regional GHG emission reduction target will be established (section 4). Through a wedge analysis and an eco-effectiveness analysis, we assess the capacity of the considered policies to reach these targets (section 5). Finally, we examine the various barriers that SB 375's implementation will face (section 6).

1. MAJOR PROVISIONS OF SB 375

1.1. Regional GHG reduction targets

SB 375 directs the California Air Resources Board (CARB), the agency responsible for implementing the Global Warming Solutions Act (AB 32), to set regional GHG reduction targets for cars and light trucks, in consultation with Metropolitan Planning Organizations (MPOs).[1] By September 30, 2010, each of the eighteen MPOs in California will receive specific transportation-related greenhouse gas (GHG) emissions reduction targets for 2020, 2035 and for 2050.

SB 375 is not the exclusive strategy for addressing the emissions from cars and light trucks. The Air Board has already approved standards to increase vehicle efficiency under AB 1493.[2] The Air Board has also adopted rules to reduce the carbon content of fuels. However, as noted earlier, fuel efficiency and better fuels will not by themselves be enough. Unless other measures are taken to reduce the growth in VMT, California will be unable to achieve its climate goals. In setting the targets for the regions, the Air Board is required to consider how much can be achieved through fuel efficiency, better fuels, and other possible strategies.

1.2. Sustainable Communities Strategy (SCS)

Transportation planning is done on a regional level in major urban areas, through the Metropolitan Planning Organizations. These MPOs are required by the federal government to prepare regional transportation plans (RTPs) in order to receive federal transportation dollars. These plans must reflect the land uses called out in city and county general plans. SB 375 requires that the state's eighteen MPOs achieve targets, set by the state, for reducing greenhouse gas emissions through

1. MPOs are regional transportation planning agencies, designated under federal law as responsible for developing federally mandated long-range regional transportation investment plans (RTPs). In most of the state's metropolitan areas, MPOs coincide with Councils of Governments (COGs), composed of representatives of local governments.
2. Bill sponsored by Senator Fran Pavley.

more efficient development and better coordination. To accomplish this, MPOs must develop and implement "Sustainable Communities Strategies" (SCSs). An SCS is an enhanced land use projection for the region, intended to set forth a forecasted development pattern that will reduce greenhouse gas emissions from automobiles and light trucks, if there is a feasible way to do so. SB 375 requires MPOs to prepare a sustainable communities strategy (SCS) to reach the regional target provided by ARB "if there is a feasible way to do so" and meets both the Regional Housing Needs Allocation (RHNA) and projected total housing needs over the entire planning period. MPOs would use the SCS for the land use pattern underlying the region's transportation plan (RTP).

The Sustainable Communities Strategy is the heart of SB 375. Prior to SB 375, the regional transportation plan consisted of three elements: a policy element, an action element, and a financial element. SB 375 added a new element to the plan—a sustainable communities strategy. SB 375 makes it explicitly clear that the regional transportation plan "shall be an internally consistent document". Thus the list of projects in the action element, the funding for transportation projects, and the SCS will have to be consistent with one another.

To fully understand what an SCS is—and is not—it's worth taking a step back and look at what is required in existing regional transportation plans. RTPs are regulated by a conglomeration of state and federal law. State law requires that an RTP include "clear, concise policy guidance to local and state officials" regarding transportation planning. The federal law requires that RTPs, among other things, work toward achieving the goals of the Clean Air Act. To that end, RTPs must be based upon "current planning assumptions." Thus, current RTPs include a likely or realistic forecasted development pattern for the region for the next 20 to 30 years. This estimate informs the decision-making process for transportation funding. Put another way, if the growth pattern is not realistic, then the accompanying policies to achieve air quality conformity relating to air pollutants from traffic are not likely to work. If the federal government determines that the projected growth development pattern is not realistic, it can withhold federal transportation funding.[3]

The contents of the SCS are similarly constrained. SB 375 states that the SCS is "subject to" federal regulations under the Clean Air Act that include the requirement to use "the most recent planning assumptions considering local general plans and other factors."

In addition, the SCS must consider or address several additional factors:

- Consider the spheres of influence that have been adopted by the local agency formation commission (LAFCO).
- Identify the general location of uses, residential densities, and building intensities within the region;
- Identify areas sufficient to house all economic segments the population of the region over the long term planning horizon of the RTP;
- Identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region;
- Identify a transportation network to service the transportation needs of the region;
- Gather and consider the best practically available scientific information regarding resource areas and farmland in the region (note, there is no requirement to act on this information);
- Set a forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, will reduce the GHG emissions from automobiles and light trucks to achieve, if there is a feasible way to do so,[4] the GHG emission reduction targets approved by the state board;
- Quantify the reduction in GHG emissions projected to be achieved by the SCS and, if the SCS does not achieve the targeted reductions in greenhouse gas emissions, set forth the difference between the amount that the SCS would reduce GHG emissions and the target for the region.

Under federal law, the RTP must reflect "current planning assumptions" for land uses, which means an SCS cannot veer very far from the current plans and policies of local government. Nothing in SB 375 requires local governments, which control most land use decisions, to alter their local plans and policies to conform to an SCS. SB 375 explicitly

3. It is important to be aware that the SCS development pattern must be based upon "current planning assumptions" only because of the requirement that the Clean Air Act imposes on the adoption of a regional transportation plan. It is federal, not state law. It relates to maintaining air quality; not local land use principles derived from the police power. The APS, which is not a part of the RTP, is not required to be based on "current planning assumptions."

4. The definition of "feasible" is the same as that used in CEQA. But unlike CEQA, the MPO's determination of "feasibility" is a quasi-legislative act that is reviewable under the "arbitrary and capricious" standard (CCP § 1085) instead of the "substantial evidence" standard (CCP § 1094.5). As a result, the decision whether or not it is feasible to achieve the regional target within the SCS will be afforded greater deference from courts.

preserves local governmental control over land use decisions: "nothing in a Sustainable Communities Strategy shall be interpreted as superseding the exercise of the land use authority of cities and counties within the region." Accordingly, SB 375 does not regulate the use of land, nor are city or county land use plans required to conform with the regional transportation plan, including the SCS. However, any inconsistency between city and county land use plans and an approved SCS, may have to be disclosed and analyzed during CEQA review for new projects.

CARB must certify that the SCS will achieve the region's GHG emission reduction targets. Transportation projects inconsistent with the SCS would not qualify for transportation funding.

If a metropolitan planning organization determines that the SCS will be unable to achieve the GHG emissions reduction target established for the region by ARB (or if the metropolitan planning organization determines the SCS will meet the GHG targets, but ARB disagrees), the MPO must document the impediments and must prepare an Alternative Planning Strategy (APS), separate from the RTP, identifying the principal impediments to achieving the targets within the SCS. The APS must also include a number of measures—such as alternative development patterns,[5] infrastructure, or additional transportation measures or policies—that, taken together, would achieve the regional target. It can thus show, for example, greater levels of transit service than would be allowed under a fiscally constrained analysis. Unlike an SCS, an APS is not constrained to match "current planning assumptions." An APS can function like a hypothetical development plan, providing an estimate of the resources and policy changes that would be needed for the region to actually achieve its greenhouse gas reduction target.

The APS is a separate document from the RTP and therefore does not automatically affect the distribution of transportation funding. Moreover, like the SCS the APS does not directly affect or supersede local land use decisions; nor does it require that a local general plan, local specific plan, or local zoning be consistent with the APS.[6] In addition, SB 375 provides that the APS does not constitute a land use plan, policy, or regulation and that the inconsistency of a project with an APS is not a consideration in determining whether a project may be deemed to have an environmental effect for purposes of the California Environmental Quality Act (CEQA).

However, the APS is not purely aspirational. First, it must be adopted by the MPO; as such, it represents an institutional statement about how a region could achieve its climate targets. Second, it must set forth the principal impediments to achieving the climate targets within the SCS. Third, it must also show why the development pattern, transportation measures, and polices it presents are the "most practicable choices for achievement" of the targets. Fourth, a general consistency with a CARB approved plan—whether it's an SCS or APS—allows projects to qualify for the CEQA streamlining provisions in the bill (see Part IV, below). And finally, it adds a new focus for the regional transportation planning and housing allocation: reductions in GHG emissions.

1.3. Alignment of longstanding planning processes: RTP, RHNA and CEQA

Before SB 375, federal and state law ignored the fact that in most areas in California, regional transportation plans and regional housing allocation plans are prepared by the same regional organization. Conflicting deadlines policies have historically caused a disconnect between regional transportation planning and regional housing policy.

To eliminate this disconnection, achieve better planning coordination and enforce the Regional Focus in developing SCSs or APSs, SB 375 aligns three longstanding planning processes in the state more closely:

- The Regional Transportation Plan (RTP) process, controlled by MPOs and overseen by the state and federal governments;
- The Regional Housing Needs Assessment (RHNA), a state-mandated process for allocating to local governments their "fair share" requirements for accommodating adequate housing, at all income levels, for each region's projected population growth. The RHNA process is also managed by MPO/COGs, in coordination with the state Department of Housing and Community Development;
- The environmental review process under the California Environmental Quality Act (CEQA), which requires that development permitting agencies conduct environmental review and mitigation, where feasible, of negative impacts of proposed development projects. SB 375 provides for regulatory streamlining under CEQA to help achieve its objectives.

5. The development pattern must still comply with the provisions of the SCS that require consistency with the RHNA distribution and other factors.

6. The CEQA changes made by the bill require residential projects to be consistent with the APS in order to take advantage of streamlined CEQA processing.

SB 375 links local housing policy more directly to RTPs, by aligning RTP and RHNA schedules in each region and requiring that they be consistent. Furthermore, RHNA requirements are also tougher under SB 375; each COG/MPO must identify, in its SCS, areas within the region sufficient to house the entire projected workforce over the planning period, without allowing any of the needed housing to "spill over" to surrounding areas. Enforcement mechanisms are also stiffer under SB 375 than in the past.

Currently state law requires local governments to update their housing element every five years, but there is no statutory requirement that they actually zone land for housing. SB 375 increases the period for the housing element update to 8 years and requires that local governments actually zone the land needed for housing. Housing Elements will be due 18 months after the SCS is adopted. Jurisdictions must re-zone Housing Element sites within 3 years of Housing Element adoption. This provides administrative relief to local governments while also providing developers with certainty as to where they can build for a full five years before the next update.

SB 375 synchronizes the timeline for updating housing elements to coincide with every other regional transportation plan approval. The alignment also prevents local governments from claiming large population growth numbers when they are seeking transportation funding, but low population growth numbers in the housing allocation process. This will align the funding for transportation projects with the state's housing allocation policy. Housing numbers must now be allocated to local governments according to the SCS. The Regional Housing Needs Allocation will be based on SCS, which means cities near transit will likely have greater housing responsibilities.

A potential casualty in this new process is the state's traditional approach to "fair share" housing allocations to promote the goal of income desegregation. Through the RHNA process, COG/MPOs allocate to each locality its "fair share" of the region's projected housing need, broken down by affordability categories. Local governments are then required to update General Plans and zoning to accommodate their target. Under SB 375, some jurisdictions may be asked to take on more housing than they would have in the past, and others less. Some low-density, wealthier, outlying suburban communities may receive smaller portions of the region's housing target.

In the larger framework of policies that guide growth management, environmental policy has traditionally been regarded as a largely "top-down" function, governed by mandates from the federal and state levels (Mazmanian and Kraft, 2009). Many prescriptive environmental mandates have significantly affected local land use and transportation planning, such as the air quality conformity mandates. However, one state environmental law—the California Environmental Quality Act (CEQA)—forms an exception to this general approach. CEQA has very substantial effects on land use decisions, but its effects come from "the bottom up" more than the "top down." Because of the close connection of CEQA to land use decision-making, SB 375 includes provisions to orient CEQA to help achieve its goals.

A strong state version of the National Environmental Policy Act (NEPA), since 1976, CEQA has required that all government regulatory actions affecting development be subject to environmental review, and to mitigation by project applicants of identified significant adverse environmental impacts "where feasible." Similar to many California planning laws, CEQA establishes mainly procedural requirements and allows local governments to retain broad authority and discretion over implementation and objectives. Although CEQA requires that localities evaluate and discuss adverse impacts and possible alternatives and mitigation measures, in the end localities may issue "Statements of Overriding Consideration" that allow a project to be approved regardless of its adverse effects.

Developers have long argued that CEQA is used as a "NIMBY" tool to resist development, as neighborhood project opponents sometimes raise complaints under CEQA which stall or modify projects. Whether or not CEQA is used as a NIMBY tool, some research indicates that the most common challenges raised under CEQA, and the most common mitigation measures adopted, do not relate directly to "traditional" environmental issues (such as water/air quality or endangered species) but rather to quality-of-life concerns about infrastructure and service deficiencies caused by projects, such as traffic, noise, and school service shortages (Johnston and McCartney 1991; Barbour and Teitz 2006). Such concerns might better be addressed through local or regional growth planning processes.

Another long-standing complaint about CEQA is that it tends to encourage incremental, project-by-project analysis and meshes poorly with long-range, comprehensive planning processes (Olshansky, 1996). Application of CEQA is often piecemeal and can result in actions detrimental to environmental quality (Landis et al. 1995).

To address concerns about incremental, project-level analysis, reforms were introduced during the 1980s and early 1990s to encourage tiering, that

is, "front-loading" environmental review as much as possible at the scale of long-range community plans.[7] These plans can then serve as a framework for subsequent review of individual projects that were outlined in them. For example, in 1993, the legislature authorized use of Master Environmental Impact Reports (MEIRs), which allow lead agencies to review environmental consequences of broad policies or programs at the planning stage, leaving more detailed examination of specific environmental impacts of subsequent projects to project-level review.[8]

However, in spite of the introduction of tiering provisions, the bridging of project and plan level review has been difficult in practice. For example, by 2002, less than one quarter of cities and counties had taken advantage of the MEIR option (OPR, 2003). Practitioners have noted various obstacles to widespread use of tiering, including legal, procedural, planning, and fiscal issues.

Such critiques suggest that widespread adoption of tiering cannot occur without incentives to support it – incentives that enable localities to front-load costs, procedural requirements, and legal vulnerability of project-level review and impacts.

As another method for overcoming CEQA obstacles to infill development, the state adopted a series of measures during the past decade to exempt infill projects from CEQA review.[9] However, research conducted in 2005 and 2006 suggested that few developers and localities were taking advantage of the exemptions[10] (Elkind and Stone, 2006). The research determined that the slow take-up rate for infill exemptions could be attributed to various factors including narrowness of the exemptions, fear of legal liability, inconsistency of many proposed projects with local General Plans, reluctance by developers to arouse "NIMBY" sentiment, and resulting preference by developers to use sites already cleared for development through local plans (Elkind and Stone, 2006).

By the mid-2000s, CEQA reform had become a hotly debated topic at the state capitol, linked to discussions about growth management reform. Governor Schwarzenegger's administration targeted CEQA reform as one way to promote housing production, advocating an easing of CEQA review (Krist, 2005).

SB 375 addresses these issues by linking CEQA review more closely to regional plans, specifically SCSs or APSs, and by strengthening the exemption for infill projects that are consistent with an SCS or APS.

1.4. Incentives, "stick and carrot"

1.4.1. SB 732: SB 375's Companion Funding Bill

In addition to SB 375, Governor Schwarzenegger signed companion bill Senate Bill 732 (SB 732), which provides funds for financially challenged local governments to engage in more sophisticated land use planning. The bill is intended to help fund agency coordination and to distribute funds in order to assist in developing and planning sustainable communities.

7. Reforms from 1979 to 1985 introduced general provisions and specific mechanisms to promote tiering, defined as the coverage of environmental effects in an EIR prepared for a policy, plan, program, or ordinance, followed by narrower or site-specific EIRs that incorporate by reference the prior EIRs. Tiering may be used for a later project when the lead agency determines that it is consistent with the program, plan, or ordinance for which the prior EIR was planned or certified, is consistent with applicable local land use plans and zoning, and is not subject to conditions requiring a subsequent EIR (such as if the later project may cause significant effects not examined in the prior EIR). The later project EIR need not examine those effects that were previously mitigated or avoided or examined sufficiently so as to be capable of being avoided by site-specific revisions or conditions for approval.

8. Under this statute, a lead agency prepares an MEIR to evaluate the cumulative impacts, growth-inducing impacts, and irreversible significant effects of subsequent projects to the greatest extent possible. An EIR is then not required for subsequent projects outlined in the MEIR if it is no more than five years old or certified adequate, includes a capital outlay program for the subsequent project, and there are no additional site-specific significant effects, based on an Initial Study. For those with some effects, a streamlined, "focused EIR" is allowed if the lead agency finds that the MEIR of cumulative, growth-inducing, and irreversible significant effects is adequate. CEQA review can be limited to impacts "peculiar to the parcel or project" unless there is "substantial new information." Since 2004, agencies have also been allowed to adopt mitigated negative declarations that tier off of MEIRs.

9. In 1998, the state legislature enacted a CEQA exemption for 100-unit affordable housing projects in urbanized areas. The same year, a categorical exemption was added to CEQA guidelines for infill development consistent with General Plans and zoning and that met other criteria (Elkind and Stone, 2006). (Categorical exemptions, provided through CEQA guidelines, are considered "soft" exemptions because the guidelines also state they should not be used if "there is a reasonable possibility that the activity will have a significant effect… due to unusual circumstances.") In 2002, exemptions for infill and affordable housing were strengthened through passage of SB 1925, which created a "harder" statutory exemption for projects that meet certain criteria, including consistency with a General Plan (Elkind and Stone, 2006). However, localities still retain considerable discretion to determine whether "unusual circumstances" exist for a given project.

10. In 2005, only 15% of local planning agencies reported having used the categorical exemption for infill. Less than 3% were using the new statutory exemption provided by SB 1925 (Elkind and Stone, 2006).

The bill establishes a Strategic Growth Council to coordinate activities and funding programs of member state agencies to meet AB 32's goals. The members of the Strategic Growth Council include the Secretary of the Resources Agency, the Secretary for Environmental Protection, the Secretary of Business, Transportation and Housing, the Secretary of California Health and Human Services, the Director of the Governor's Office of Planning and Research, and one member of the public to be appointed by the Governor.

One of the Strategic Growth Council's assigned duties is to "provide, fund, and distribute data and information to local governments and regional agencies that will assist in developing and planning sustainable communities." The Strategic Growth Council also is directed to "manage and award grants and loans to support the planning and development of sustainable communities." To qualify for funding, the plan or project must be consistent with AB 32 and any applicable regional plan, such as an SCS or APS.

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

1.4.2. Transportation Funding Incentives

Since an MPO does not have actual land use authority, the implementation of the SCS must be through transportation funding and other incentives. Existing federal law requires that all projects with federal funding or projects that are regionally significant be consistent with the regional transportation plan. By placing the SCS inside the regional transportation plan, transportation funding becomes a powerful incentive for its implementation. This means roughly $15-20 billion per year of local, state and federal funding will flow to transportation projects contained in an SCS.

While local governments remain free to make land use decisions, they presumably will be seeking funding for transportation infrastructure to support them. The availability of transportation infrastructure funding to support the development pattern in the SCS should encourage local governments to make land use decisions consistent with that plan. This would normally be expected to affect all but the smallest land use projects.

In fact, in recognition of the role played by regional planning, nearly a third (157 out of 536) of California's local governments are already taking steps to align their general plans with the preferred land use pattern identified in the regional blueprint plan.[11] This trend should accelerate under SB 375.

1.4.3. Environmental Review Incentives

Since enactment of the California Global Warming Solutions Act of 2006 (AB 32), it is generally acknowledged that CEQA requires consideration of a project's potential impacts on global warming. Project proponents attempt to identify a wide variety of measures to mitigate or avoid a project's contribution to global warming. CEQA now plays an important role imposing global warming mitigation prior to adoption of the final set of policies by the Air Board pursuant to AB 32. Yet, because CEQA is focused on projects and on mitigating the impacts of those projects, it is not suited to the type of large-scale, comprehensive analysis required to effectively reduce VMT. In fact, in the hands of opponents to a high-density project, CEQA could threaten the implementation of an effective greenhouse gas reduction strategy. Even CEQA review of a citywide general plan is not sufficient. That is mainly because, even at the city level, the perspective is not broad enough to design land use and transportation policy that will effectively address global warming impacts.

Therefore, CEQA will apply to the adoption of the regional transportation plan itself, and its application there makes sense. Under CEQA, individuals will be able to comment on the proposed regional-scale decisions and question whether they are the best way to achieve the climate objectives of the region. But with respect to project level analysis, SB 375 adjusts CEQA so that it functions more effectively regarding global warming.

It is important to note that the changes in SB 375 are to CEQA, not to a local government's zoning authority. It is still up to the local government to decide whether or not to approve these changes. If it does, SB 375 creates a better CEQA process to review those proposals.

SB 375 introduces a number of new terms into the CEQA lexicon, but two of the most important

11. Governor's Office of Planning and Research, 2009, California Planners' Book of Lists.

are Transit Priority Projects and Sustainable Communities Projects. CEQA relief is available to certain Transit Priority Projects that meet specific criteria (discussed below), while complete exemption from CEQA is reserved for Transit Priority Projects that also are classified as Sustainable Communities Projects.

A Transit Priority Project must be consistent with the applicable SCS or APS drafted for the region by the metropolitan planning organization and approved by ARB. More specifically, a Transit Priority Project is defined as a project located close to mass transit resources which are included in the Regional Transportation Plan. It must be within one-half mile of a major transit stop or a "high-quality transit corridor" (defined as a corridor with fixed-route bus service every 15 minutes or less). The project must have at least 50% residential use, based on total building square footage. The project also must have a minimum net density of at least 20 dwelling units per acre. If a project qualifies as a Transit Priority Project, it qualifies for streamlined CEQA relief, which is discussed below.

To qualify for a complete CEQA exemption, however, a Transit Priority Project must further qualify as a Sustainable Communities Project. In order to be designated a Sustainable Communities Project, the legislative body must conduct a public hearing and find that the proposed Transit Priority Project satisfies three different areas of requirements. The project must satisfy eight environmental criteria, seven land use criteria, and must serve the community's affordable housing or open space needs.

Environmental Criteria

The environmental criteria are broad. The project must be adequately served by existing utilities. The site of the project cannot contain wetlands or riparian areas, and cannot have significant value as a wildlife habitat. The site is subject to a preliminary endangerment assessment prepared by a registered environmental assessor to determine the existence of any release of a hazardous substance and to determine the potential for exposure of future occupants to significant health hazards from any nearby property or activity. The CEQA rules regarding significant effects on historical resources still apply. The property cannot be unduly hazardous in regards to natural disasters. The land cannot be already developed as public open space such as playgrounds, ball fields, or swimming pools. The buildings within the Transit Priority Project also are required to be 15% more energy efficient than required by the California Code of Regulations

Land Use Criteria

The land use criteria are similarly detailed. Projects cannot be more than eight acres in total area, cannot include any single building that exceeds 75,000 square feet and cannot have more than 200 residential units. The project also cannot result in any net loss in the number of affordable housing units within the project area. The project must incorporate any applicable mitigation measure or performance standards or criteria set forth in prior environmental impact reports. The legislative body also must determine that the project does not conflict with nearby operating industrial uses. In addition, the project must be close to transit; this requirement is more stringent then the general Transit Priority Project proximity requirement because the project must be located within one-half mile of a rail transit station or a ferry terminal in a Regional Transportation Plan or within a quarter mile of a high-quality transit corridor included in the RTP.

Affordable Housing and Open Space Needs

Finally, the project must satisfy one of three requirements. The developers must: (1) legally ensure that a portion of the project will either be sold to moderate income families or rented to low income families; (2) pay adequate in-lieu fees to result in the development of an equivalent number of low income housing; or (3) provide public open space equal to or greater than five acres per 1,000 residents of the project.

If the legislative body finds that these requirements are met, the Transit Priority Project is declared to be a Sustainable Communities Project and is exempt from CEQA:

- Do not need to analyze the project's growth-inducing impacts because the project has already been determined at the regional level to be an appropriate location for growth;
- Do not need to analyze impacts on global warming because the projects have been found to be in locations consistent with achieving state climate policy;
- Do not need to analyze impacts on the regional transportation network, because this is the central job of the RTP which has already been approved;
- Will not need to address off-site alternatives or cumulative impacts;
- Will not need to include additional traffic mitigation measures, provided the local jurisdiction has previously adopted traffic mitigation ordinances or measures.

Even if a Transit Priority Project fails to meet all of these requirements, however, it still may qualify for limited CEQA relief.

Forms of Limited CEQA Relief

Projects that do not meet the Sustainable Communities Project standard are still eligible for some relief from CEQA. Qualified Transit Priority Projects are eligible for minimized and streamlined CEQA review.

1. Minimized CEQA Review for Certain Transit Priority Projects

If a Transit Priority Project incorporates all feasible mitigation measures, performance standards, or criteria set forth in prior applicable EIRs, the Transit Priority Project can be reviewed through one of two new types of environmental documents, a Sustainable Communities Environmental Assessment (which is a modified negative declaration or mitigated negative declaration), or a shorter, more limited EIR.

a. New CEQA Document: Sustainable Communities Environmental Assessment

A Sustainable Communities Environmental Assessment requires an initial study that identifies all significant or potentially significant impacts of the project. Like a negative declaration or a mitigated negative declaration, the assessment must contain measures to avoid or mitigate all significant or potentially significant effects of the project. After the lead agency conducts a public hearing and makes a series of findings regarding the mitigation of the significant or potentially significant effects, it can approve the assessment. Unlike a negative declaration or a mitigated negative declaration, however, the lead agency's decision to review and approve a project with a Sustainable Communities Environmental Assessment is reviewed not with the more stringent "fair argument" standard, but under the "substantial evidence" standard, which is a standard of review that is generally deferential to the agency's action.

b. Shorter, More Limited EIR

If the lead agency decides to review a Transit Priority Project with an EIR, the Transit Priority Project can be studied through a shorter EIR than that generally required under CEQA. First, the lead agency must prepare an initial study to identify all significant or potentially significant effects of the Transit Priority Project. The study must identify effects that have been adequately addressed and mitigated in prior applicable EIRs. Because a Transit Priority Project is consistent with the regional SCS (or APS), the EIR "need only to address the significant or potentially significant effects of the transit project on the environment" and is not required to analyze off-site alternatives to the project.

Table 1. Key Dates in the Implementation of SB 375

December 31, 2008	Projects specifically listed on a local ballot measure prior to this date are exempt from the requirement to be consistent with the SCS
January 1, 2009	CARB adopts Scoping Plan, which will include the total reduction of carbon in million metric tons from transportation planning
January 31, 2009	CARB shall appoint a Regional Targets Advisory Committee (RTAC) to recommend factors to be considered and methodologies to be used for setting reduction targets
June 1, 2009	MPOs in attainment areas and Regional Transportation Planning Agencies not within an MPO may elect to opt into the 8 year planning cycle.
September 30, 2009	RTAC must report its recommendations to the CARB
June 30, 2010	CARB must provide draft targets for each region to review
September 30, 2010	CARB must provide each affected region with a GhG emissions reductions target.
October 1, 2010	Beginning this date, MPOs updating their RTP will begin 8 year planning cycle that includes SCS-APS and alignment for the RHNA process.
December 31, 2010*	Transportation sales tax authorities need not change allocations approved by voters for categories of projects in a sales tax measure approved by voters prior to this date.
December 31, 2011	Federal Statewide Transportation Improvement Projects programmed before this date are exempt from the requirement to be consistent with the SCS

2. Streamlined CEQA Review for Certain Transi Priority Projects and Certain Other Largely

Residential Projects

Any Transit Priority Project that qualifies for a Sustainable Communities Environmental Assessment or a shorter, more limited EIR, as discussed previously, also qualifies for streamlined CEQA review. In addition, SB 375 provides streamlined CEQA review for certain qualified residential or mixed-use developments that do not otherwise qualify as Transit Priority Projects. To qualify for streamlined CEQA review, a non-Transit Priority Project development must be at least 75% residential. The region must have an approved SCS, and the project must incorporate any mitigation measures from prior environmental documents. If these requirements are met, the development may qualify for streamlined CEQA review.

If a Transit Priority Project or qualified mixed-use project is subject to streamlined CEQA review, then any findings or other determinations for an

exemption, a negative declaration, a mitigated negative declaration, a Sustainable Communities Environmental Assessment, or an EIR are not required "to reference, describe or discuss: (1) growth inducing impacts; or (2) any project specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transport network." If the CEQA document is an EIR, it "shall not be required to reference, describe, or discuss a reduced residential density alternative to address the effects of car and light-duty truck trips generated by the project."

1.4.4. Including Affordable Housing in Housing Development plan

SB 375 also includes amendments to the Government Code's housing requirements. The amendments are designed to coordinate regional housing needs with the Regional Transportation Plan. Planning and zoning laws require each city and/or county to prepare and adopt a general plan for its jurisdiction, which includes a housing element. Local governments' housing elements now must allocate housing units consistent with the development pattern envisioned in the regional SCS. After the SCS is adopted, local governments have 18 months to adopt a revision of the housing element.

SB 375 substantially strengthens the affordable housing obligations for cities and counties. SB 375 requires aggressive action on the part of local governments to provide additional housing stock, including affordable housing. The Government Code previously allowed a local government housing program simply to identify sites that could be developed for housing. Under SB 375, however, if a local government's inventory of land suitable for residential development does not identify adequate sites for all household income levels, the sites must be re-zoned. The re-zoning must include minimum density and development standards.

Under certain conditions, a local government's failure to re-zone can strip it of some of its planning power. SB 375 makes it mandatory for a local government to comply with the re-zoning requirement. If the local government fails to re-zone within the mandated time period, it may "not disapprove a housing development project, planned unit development project, nor require a conditional use permit, planned unit development permit, or other locally imposed discretionary permit, or impose a condition that would render the project infeasible" if the project is in an area that must be re-zoned. And if the government does not comply, any interested party can sue.

A reviewing court has the power to allow a qualified project to be built as if the appropriate zoning had taken place. Furthermore, a local government can be compelled by the courts to complete the re-zoning required by SB 375. If a court finds that the re-zoning has not taken place, the court must issue an order or judgment "compelling the local government to complete the rezoning within 60 days or the earliest time consistent with public hearing notice requirements in existence at the time the action was filed."

1.5. Travel Demand Models

As California's 18 federally designated MPOs develop their sustainable communities strategies to reduce greenhouse gas emissions, each will run its SCS through some form of travel-demand model to predict the impacts of its proposed growth patterns and investment decisions.

Many regions currently lack the capacity to accurately predict the trips generated by different types of development and further lack the ability to model the impacts of other policies regions might use to improve air quality and reduce greenhouse gas emissions. A recent in-progress study by the MPOs under the auspices of the Regional Target Advisory Committee (RTAC) provides detailed confirmation of this finding. Some of the models are insensitive to the type of land use projected for the region and instead simply use a formula where a certain number of trips are generated for each new housing unit, regardless of location, proximity to transit, or density of surrounding uses. Clearly the shortcomings of the models are a disservice to the regions. The models also fall short in their ability to predict land use changes that result from certain types of transportation investments.

Land use and transportation decisions last for decades. Because the design of communities affects people's choice to drive and how much to drive, SB 375 seeks to help regional agencies understand accurately the impacts of their investment decisions on future residents' need to drive and, consequently, the ability of the region to reduce its greenhouse gas emissions in accordance with AB 32 and SB 375.

In this regard, SB 375 requires[12] that regional

12. The ability of transportation models to accurately predict VMT is receiving much attention—even on a national scale. In March 2009, Representative Matsui (D-Calif.) introduced the Smart Planning for Smart Growth Act of 2009, which specifically highlights the need for improved models that can more accurately capture the VMTreduction benefits of various land use and transportation investment decisions. Senators Carper (D-Del.) and Specter (D-Pa.) and Representatives Blu-

planning agencies must use updated transportation models that take into account

- The relationship between land use density and household vehicle ownership and vehicle miles traveled in a way that is consistent with statistical research.
- The impact of enhanced transit service levels on household vehicle ownership and vehicle miles traveled.
- Induced travel and land development likely to result from highway or passenger rail expansion.
- Mode splitting that allocates trips among automobile, transit, carpool, bicycle, and pedestrian trips. If a travel demand model is unable to forecast bicycle and pedestrian trips, another means may be used to estimate those trips.
- Speed, frequency, days, and hours of operation of transit service.
- Effect of pricing strategies on vehicle miles traveled and greenhouse gas emissions.

2. INSTITUTIONAL FRAMEWORK

2.1. Stakeholders

In general, the California policy approach establishes a decentralized system with four different aspects:

- The state establishes the procedural structure. Most of California's urban planning-related laws are not prescriptive or substantive in nature. They do not seek to dictate specific policies to local governments. Rather, they lay out a detailed set of procedural requirements that local governments must follow in adopting and implementing their plans.[13]
- Local governments are required to address specific issues but are given considerable leeway in determining policy direction. State does not dictate land use planning policies, but does require a local government to consider a wide range of policy issues when drawing up and implementing its plans. But, with few exceptions, local governments can choose their own policy direction: they can set their own goals and decide how much weight to accord to such potentially competing issues.
- Planning laws are generally enforced *via* citizen enforcement. In most areas of public policy, if the state government asserts control over the field, the states issues regulations, which are enforced by a state administrative agency. Because planning laws are mostly procedural, few state administrative agencies enforce them on local governments (Fulton, Shigley, 2005). According to Fulton and Shigley (2005), this situation is a deliberate political decision on the part of California's voters, its politicians, and its lobbyists. Local governments do not want strong oversight of their planning obligations, and neither voters nor politicians are interested in expanding the state bureaucracy to make sure urban planning laws and CEQA are carried out in a lawful manner. Because there is no administrative agency to enforce them, the planning laws and CEQA are supposed to be enforced by direct citizen action – or so-called "citizen enforcement". Citizen enforcement means that citizens and citizens groups are supposed to be watch-dogs of the planning process, holding local governments accountable. Therefore, if the land use planning arena is rife with lawsuits, it is supposed to be that way (Fulton, Shigley, 2005).
- Little formal coordination is required, although certain laws and funding programs encourage cooperation among local, regional, state, and federal agencies.

Zoning ordinances and general plans are drawn up at the local level. Building permits and other development approvals are issued at the local level. The local planning commission or city council may have the power over the zone change or the building permit, but the nature of that power is shaped by other forces, usually involving higher levels of government. Judges, the state legislature, various governmental agencies, even congress and the US Supreme Court all play a role in determining how local planning commission or city council is permitted to regulate the use of land.

Private companies and the private market place also play an important role in determining what the final product of the planning process will be. Developers will not propose building something unless they believe there is a market to buy it, and usually they will not be able to borrow the money to build it unless there is a financial institution willing to invest.

menauer (D-Ore.) and Tauscher (D-Calif.) introduced CLEAN-TEA to allocate 10% of emissions allowances under a cap-and-trade program to fund better transportation planning to reduce GHG emissions. Improved data collection and modeling is specifically described as an important preliminary step to inform any future planning efforts.

13. This procedural approach stands in contrast to the approach to planning in several other important states. In Oregon, Florida, and New Jersey, for example, the state government plays a more direct role in policy making on land use matters, establishing specific policy goals local governments must pursue in land use planning. Maryland uses a different approach – providing financial rewards in the form of state funding for infrastructure and land conservation projects that conform to the state's own policy goals.

The hierarchy of regional and local agencies that engage in transportation and land use planning, programming, and funding can be confusing. State and federal laws requires local and/or metropolitan agencies to engage in a wide variety of activities. State and federal laws attach different name to the agency that performing each activity. To make matters more confusing, several of these functions are performed by the same local agency. But in each metropolitan area, the array of regional and local transportation functions will be divided differently among the different agencies.

2.1.1. Local governments

California has 478 cities, a large number by any USA standard. And the state has 58 counties – a relatively small number. Many California's counties, especially those in Southern California, are among the largest in USA.

Cities and counties divvy up the power to regulate land use in a very simple way: cities have jurisdiction over land inside their borders, and counties control what's left – the so-called "unincorporated" territory. Thus, cities have a certain strategic territorial advantage. Any time a city incorporates or annexes more land, it wrests land use power (as well as tax revenue) away from the county.

Because they control so much agricultural and other nonurban land, county-level land use planning often has a rural or resources focus. But counties are often in the "urban" land use planning business as well, because new developments often locate in unincorporated areas.

Under state law, every county and every city has a legislative body and a planning agency. A county's legislative body is called the Board of Supervisors, while a city's is called the city council.

Local planning staff

Although they merely recommend actions to planning commissions, city councils, and board of supervisors, local planning staffs wield tremendous influence over planning in California. One particular reason explain that: most members of city councils and planning commissions serve only part-time, often with no pay. Therefore, staff members control most of the information that goes to a local city council or planning commission, and they always have the last world in a debate at a public hearing (Fulton, Shigley, 2005).

Cities and Counties set land-use policy and plans, nominate transportation projects for funding by the RTPA, and administer local roads and streets. County transportation authorities develop expenditure plans for voter-approved local option sales tax measures.

Transit agencies (such as BART) nominate projects for funding and provide public transit services.

Congestion Management Agency (CMA), The CMA is the county agency designated under both state and federal law to be responsible for developing, coordinating and monitoring the Congestion Management Program (CMP).

County Transportation Commission (CTC) or County Transportation Authority (CTA)

The CTC/CTA performs a variety of functions that differ from county to county. Among other things, the CTC/CTA might be charged with administering local transportation funding programs (such as transportation sales tax) and might also be the operator of the local transit system.

Air Pollution Control District (APCD) is a county agency that adopts regulations to meet State and Federal air quality standards.

However different types of agencies perform different functions in different parts of the state. For example, in the five-county region comprising Greater Los Angeles, the MPO is the Southern California Association of Governments (SCAG), which is also the regional COG. However RTPA and CMA functions are carried out by individual county transportation commissions. In Los Angeles County, the county transportation commission has been subsume as part of the giant LA county Metropolitan Transportation Authority (MTA), which is also the region chief transit operator. The Bay Area has a completely different structure. The Bay Area Metropolitan Transportation Commission, or MTC, serves as both the MPO and the RTPA, thereby combining many transportation-related functions. But the MTC is not the designated CMA for the nine Bay Area counties; that function is filled by county-level entities such as the Santa Clara County CMA. However, unlike LA, where SCAG serves as both COG and the MPO, the MTC is separate from the Bay Area's COG, the Association of Bay Area Governments (ABAG).

2.1.2. Regional Agencies

In California's metropolitan areas, three regional institutions are responsible for mediating conflicts between local control and regional goals.

Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies (RTPAs): MPOs and RTPAs are responsible for planning, coordinating and administering funds for regional transportation systems. In California, 18 federally designated Metropolitan Planning Organizations (MPOs) and 26 State statutorily

Figure 1. California MPOs and RTPAs

created Regional Transportation Planning Agencies (RTPAs) prepare Regional Transportation Plans (RTP).

Metropolitan planning organizations (MPOs) are responsible for preparing and updating a regional transportation plan (RTP) describing how transportation revenues across the region will be spent over the next 25 years (Fulton and Shigley 2005).

To carry out various transportation planning functions, MPOs receive annual Federal metropolitan planning funds from the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). Twenty-six designated RTPAs receive annual State planning funds called rural planning assistance (RPA) to carry out their respective planning requirements. The map on the next page identifies the 18 MPOs (in darker shade) and the 26 RTPAs that prepare RTPs (in lighter shade or dot pattern).

Councils of governments (COGs) are assemblies of local officials that provide information on regional land use problems. In general, COGs also serve as MPOs, with a notable exception in the Bay Area, where the Metropolitan Transportation Commission (MTC) serves as the region's MPO and prepares the RTP, while the COG, the Association of Bay Area Governments (ABAG), creates demographic projections and performs other land use planning functions, such as the regional housing needs assessment.

COG/MPOs act as an interface between local governments and state and federal programs and have no independent authority as such. COG/MPOs are governed by representatives of local governments and sometimes other entities such as transit districts, and are not directly accountable to voters. Governing boards of the larger COG/MPOs generally operate on a combination of population and one-government, one-vote bases.

This structure maintains broad local government "buy-in" for regional decision-making; COG/MPOs must devise policies that gain broad support from member local governments. To implement SB 375, COG/MPOs must convince member local governments that adopting local policies with regional benefits is in their self-interest. In relation to land use, COG/MPOs have no actual authority; they can only influence local policy by providing incentives from their own resources, or through peer pressure or technical assistance.

The voluntary, collaborative COG/MPO governance structure has long made it difficult to develop plans and programs with a strong regional systems focus. The governing structure can foster a "lowest common denominator" approach to policymaking, steering away from controversial policies that could create winners and losers among local government members. COG/MPOs face a structural incentive to allocate benefits or mandates equally across jurisdictions .

Air Quality Management District (AQMD) is a regional agency formed by two or more counties, which adopts regulations to meet State and Federal air quality standards.

Under federal law, the Regional Transportation Plan and the Air Quality Plan must be in conformance with one another. Therefore, AQMD and APCD have significant interactions with MPO over RTPs.

2.1.3. Federal and State Rule makers

This category is compounded by California legislature, Congress, and the court system, all of which set and often apply the rules by which local governments play the planning game.

Local governments do not have much autonomy in organizing the way the planning process is set up. In fact, local governments are at the mercy of the rule-makers – the US congress, the California legislature, and the state and federal court systems – which shape their land use power through both legislation and litigation.

Regarding transportation, the legislature establishes overall policies, including determining funding sources and distribution, and spending priorities through state statutes such as Revenue and Taxation Code, Streets and Highways Code, and Government Code. The Legislature appropriates funds through the annual budget for transportation projects and has authority to designate transportation projects statutorily.

Congress. Congress is important, but its role in planning is indirect. Indeed, congress has passed a vast array of laws, mostly environmental, that affect the land use process at the local level.

The California legislature. The California legislature plays a far more direct part in establishing the roles of local planning. It has created the entire framework for local planning. The legislature passed the precursor to the Subdivision Map in 1893 and the first general plan law in 1927. Specific elements were first required in a general plan during the 1950s, and the requirement that a zoning ordinance and general plan must be consistent with one another passed the legislature in 1971. The legislature has also passed a host of other laws affecting land use, including the Community Redevelopment Law in the 1950s, and the California Environmental Quality Act, which dates from 1970.

The courts. Litigation is rife in land use disputes. Therefore, many experts accept litigation as a part of planning (Fulton, Shigley, 2005). Indeed, because planning law is based on the concept of "citizen enforcement", local governments are held accountable to the law only through litigation. Because most laws affecting local planning are state laws, many cases wind up being heard in state courts. However, because protections for wetland and endangered species often result from federal laws and administrative regulations, suits involving those issues often are filed in federal courts.

Governor's Office of Planning and Research (OPR). Unlike many states, California has no cabinet-level administrative depertment dealing with land use planning or community affairs. But the state does have on office in Sacramento that is supposed to deal with planning issues: the Office of Planning and Research (OPR). OPR has several statutory duties, including the preparation of the CEQA guidelines (that are binding on local governments) and the General Plan Guidelines. The office also provides assistance to local government on planning issues and administers certain other procedural requirements, such as the collections of EIRs.

2.1.4. State and Federal agencies

State and Federal agencies can be divided into two types: "conservation agencies" and "development agencies" (Fulton, Shigley, 2005). Conservation agencies include agencies that regulate the use of land indirectly through the enforcement of environmental laws, as well as land-owning agencies charged primarily with land conservation and resource management. Development agencies include agencies in the business of constructing infrastructure, installation, and buildings required by state and federal governments.

It is important to note that state and feral agencies have traditionally been so insular and bureaucratic that they have had as much trouble cooperating with each other as they have with local government (Fulton, Shigley, 2005). During the 1990s, their approach began to change. Many state and federal agencies started to cooperate with local governments and with each other. In part, this resulted from a concerted partnership effort on the part of state and federal agencies dealing with the protection of natural resources. Greater cooperation with local governments has emerged from a growing awareness that state and federal programs are often unpopular and local political buy-in is necessary to make them successful (Fulton, Shigley, 2005).

We are presenting here only the agencies that have influence on transport – land use interaction issues in urban context.

Federal Development agencies

Department of Housing and Urban Development (HUD). The HUD does not actually construct community facilities but plays an important role in funding them. HUD continues to subsidize public housing authorities that own and operate publicly owned low-income housing projects. HUD also operates many programs that provide funding for affordable housing owned by non-profits, commercial development projects in struggling downtowns, and other urban redevelopment efforts.

Most federal transportation functions are consolidated under the US Department of Transportation. Two agencies within DOT are critical to the transportation programming and funding process in California:

Federal Highway Administration (FHWA) established to ensure development of an effective national road and highway transportation system. FHWA oversees the preparation of the State Transportation Improvement Program (STIP), and also oversees the distribution of ISTEA Highway money.

Federal Transit Administration (FTA), (formerly the Urban Mass Transit Administration), a component of the U.S. Department of Transportation, responsible for administering the Federal transit program under the Federal Transit Act, as amended, and SAFETEA-LU.

Historically, FTA has worked more directly with local and regional transportation agencies than FHWA, which has used Caltrans as an intermediary. This relationship is partly because of the fact that federal transit funds are often used for operations as well as capital projects. FHWA and FTA, in consultation with US EPA, make Federal Clean Air Act Conformity findings for Regional Transportation Plans, Transportation Improvement Programs, and Federally funded projects.

Federal Conservation agencies

United States Environmental Protection Agency (U.S. EPA). EPA is the most wide-ranging regulatory agencies in the federal government. EPA plays an important indirect role in local planning by administrating the Clean Air Act. EPA is also the Federal agency that approves the SIP and the emissions budgets that are the basis of the RTP conformity assessments.

State Development agencies

California Department of Housing and Community Development (HCD) and California Housing Finance Agency (HFA). These agencies do not construct affordable housing projects but do provide funding to local governments, non-profits, and developers that do. In addition, HCD has oversight (but not regulatory) power concerning local housing elements.

California Transportation Commission (CTC): California Transportation Commission is a decision making body established in 1977 to advise and assist the Secretary of Transportation and the legislature in formulating and evaluating State policies and plans for transportation programs. CTC's primary job is to allocate all federal and state funds, including gas tax and sales tax revenue. The CTC's main vehicle is the State Transportation Improvement Program, which includes a seven-year plan for all transportation capital projects to be funded. The nine members CTC, appointed by the Governor, reviews and adopts the state transportation programs and prioritizes projects nominated by Caltrans and regional agencies for funding. The CTC recommends policy and funding priorities to the Legislature and is also responsible for project delivery oversight.

California Department of Transportation (Caltrans). The California Department of Transportation (Caltrans) is the owner and operator of the State Highway System (SHS), which consist of the 15,000 miles (51,000 lane miles) of Interstate Freeways and State Routes and carries over half of the travel in the state. Caltrans also provides funding for a variety of other transportation projects, ranging from intercity rail lines to Transportation Demand Management programs.

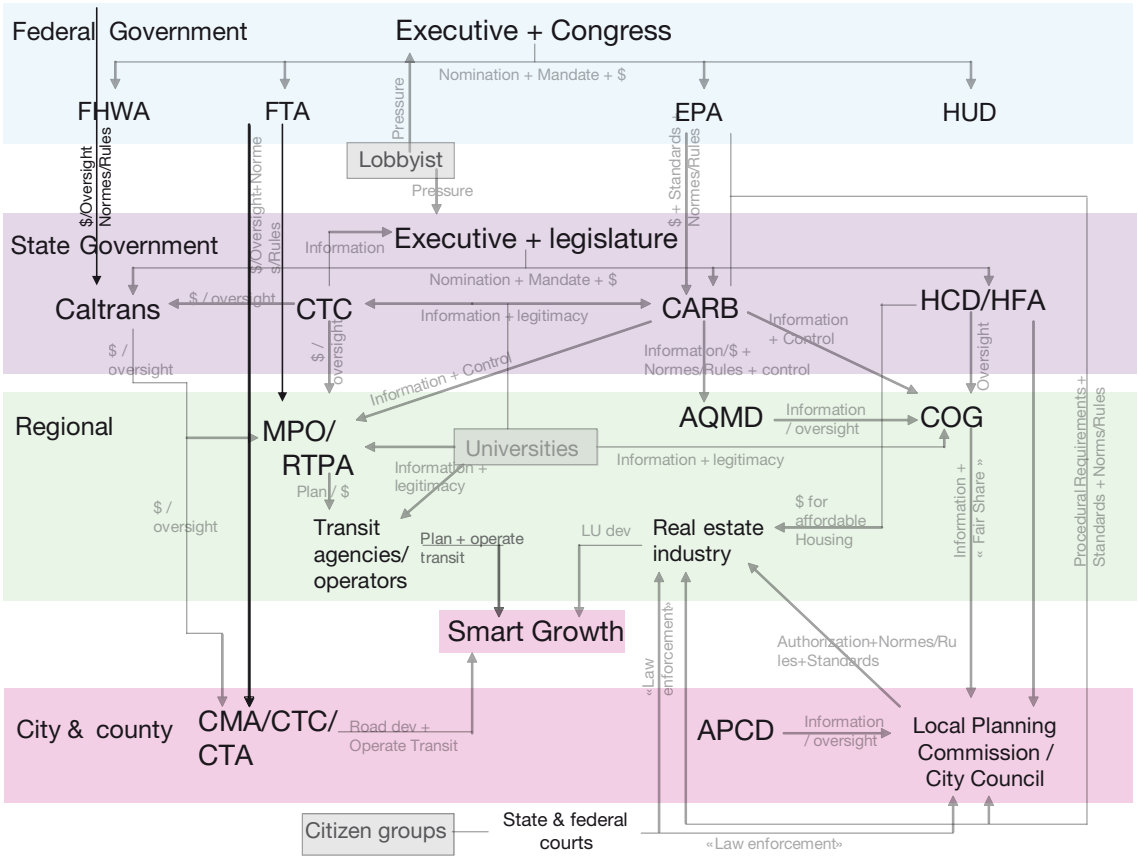
State Conservation agencies

Four state agencies are responsible for land

Table 2. Transportation funding sources, primary purpose, and amounts, organized by decision-maker

Funding source	Primary purpose	Amount ($billions)	% total
Funds allocated by the federal government		20.3	2.7%
Non-formula Federal Transit Administration (FTA) grants	Transit capital and operations	8.9	1.2%
Earmarks and other discretionary programs	Varies	10.5	1.4%
Auto-oriented discretionary programs	Road improvements	0.9	0.1%
Funds allocated by CalTrans		**89.5**	**11.8%**
Federal programs administered by CalTrans	Highways and local streets	3.7	0.5%
Non-motorized transportation programs	Non-motorized	0.1	0.0%
Federal airport funding	Aviation	0.5	0.1%
Interregional Transportation Improvement Plan (ITIP)	Highways and local streets	10.0	1.3%
State Highway Operation and Protection (SHOPP)	Highway maintenance	58.7	7.7%
Bicycle Transportation Account (BTA)	Non-motorized	0.0	0.0%
Proposition 1B revenues	State priority projects	5.4	0.7%
California Aid to Airports (CAA)	Aviation	0.0	0.0%
Environmental Enhancement and Mitigation (EEM)	Streetscaping, TDM/TSM	0.8	0.1%
Other		10.2	1.3%
Funds allocated by MPOs		**97.6**	**12.9%**
Regional Surface Transportation Program (RSTP)	Highways and local streets	6.7	0.9%
Congestion Management and Air Quality (CMAQ)	Transit, TCMs	6.0	0.8%
Formula-based FTA grants	Transit capital and operations	20.1	2.6%
Transportation Enhancement Act (TEA)	Streetscaping	0.2	0.0%
Regional Transportation Improvement Plan (RTIP)[1]	Regional capital projects	7.1	0.9%
Local Transportation Funds (LTF)	Transit and non-motorized	7.5	1.0%
Population-based State Transit Assistance (STA)	Transit operations	3.1	0.4%
Self-help revenue	Varies	27.7	3.6%
Tolls	Varies	19.0	2.5%
Other		0.2	0.0%
Funds allocated by air quality management districts		**0.6**	**0.1%**
Vehicle license fees		0.6	0.1%
Funds allocated by county and city governments		**466.2**	**61.4%**
Gas tax subventions	Local streets	37.3	4.9%
Self-help revenue	Varies	211.6	27.9%
General funds	Varies	31.4	4.1%
Local Transportation Funds (LTF)	Local streets, transit	68.8	9.1%
Regional Transportation Improvement Plan (RTIP)	Regional roads, transit	25.6	3.4%
Tolls	Toll road operations	7.4	1.0%
Other		84.1	11.1%
Funds allocated by transit agencies		**84.9**	**11.2%**
Transit agency revenues	Transit operations	75.6	10.0%
Revenue-based State Transit Assistance (STA)	Transit operations	9.3	1.2%
Total		**759.1**	**100 %**

Figure 2. Map of stakeholder's capacity to act



Source: Rose, 2010, Based on a review of current RTPs at all 18 MPOs affected by SB 375.

List of acronyms: AQMD: Air Quality Management District APDC: Air Pollution Control District Caltrans: California Department of Transportation CARB: California Air Resources Board CMA: Congestion Management Agency COG: Councils of governments CTC: County Transportation Commission CTA: County Transportation Authority EPA: United States Environmental Protection Agency FHWA: Federal Highway Administration FTA: Federal Transit Administration HCD: California Department of Housing and Community Development HFA: California Housing Finance Agency HUD: Department of Housing and Urban Development MPO: Metropolitan Planning Organizations OPR: Governor's Office of Planning and Research RTPA: Regional Transportation Planning Agencies SHS: State Highway System

use in specific geographical area: the Bay Area Conservation and Development Commission, the Coastal Commission, the Tahoe Regional Planning Agency, and the Delta Protection Commission. All but the Delta Protection Commission have explicit land use regulatory authority that usurps the power of local governments.

California Air Resources Board (CARB), the State agency responsible for implementation of the Federal and State Clean Air Acts. Provides technical assistance to air districts preparing attainment plans; reviews local attainment plans and combines portions of them with State measures for submittal of the State Implementation Plan (SIP) to U.S. EPA.

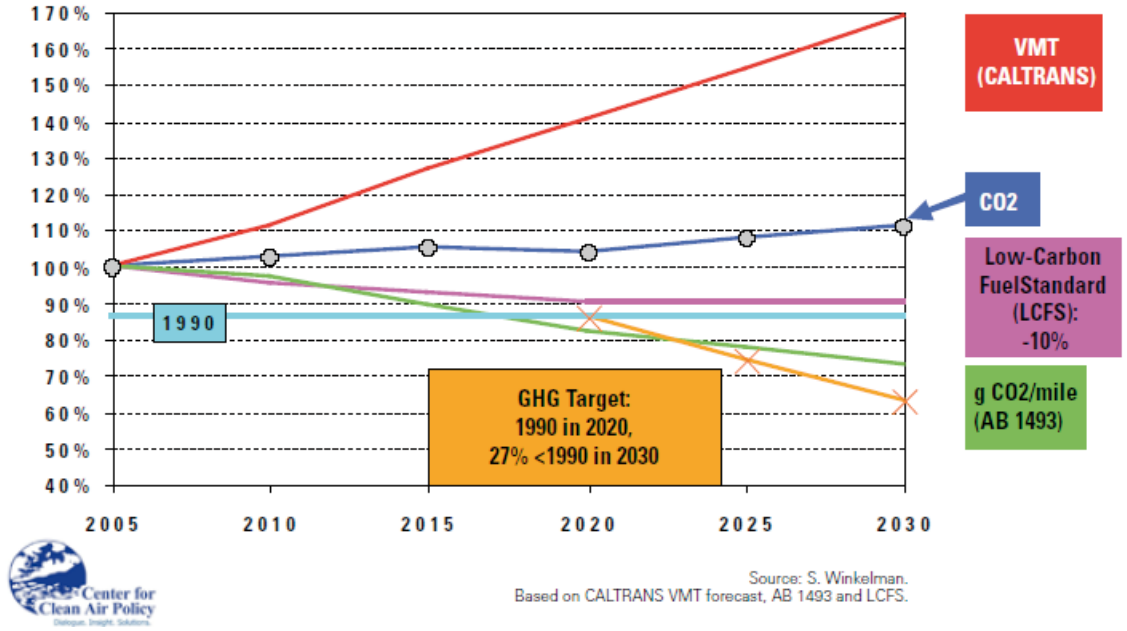
2.1.5. Private sector: transport operators and real estate industry

Transport operators. Private transport operators represent a small share of transit supply and operate mainly under services management contracts. Private transport operator's influence on policy design and public decisions is done through the American Public Transportation Association (APTA).

Real Estate Industry. This category of actors is compounded by developers, homebuilders, real-estate lenders, and investors, who influence the planning process through their private business decision.

Land owners. These are the institutions and individuals who actually own the property. Often they are passive participants in the planning process.

Figure 3. Increasing VMT Threatens to Overwhelm Greenhouse Gas Savings From Cleaner Fuels and Vehicles



Source: Climate Change Scoping Plan Appendices, California Air Resources Board, December 11, 2008

Land developers. These businesses and individuals specialize in planning real estate developments and obtaining land use approvals. They can be one-person operations or gigantic landowning companies (like Irvine Company). Many developers do not actually buy the land for which they are seeking approvals; instead, they go into partnership with passive landowners or buy options to purchase the property if approvals are obtained. Simlarly, many developers do not actually build the projects they plan. Once approvals are obtained, they sell the entire project, or pieces of it, to companies that specialize in building. It is worth to note that developers are big campaign contributors (Fulton, Shigley, 2005).

Builders. These are the companies and individuals who specialize in actually constructing the buildings. Large builders will also act as developers and obtain their own project approvals. More typically, they will buy and construct one neighbourhood in a larger development for which a land developer has already obtained approvals.

Investors and lenders. These are the institutions that provide the financial resources required to obtain land use approvals and construct buildings. Thus, developers' actions are driven largely by the demands placed upon them by investors and lenders. These include commercial banks, which typically provide the short-term loans required for constructions; pension funds (such as California Public Employment Retirement System), which purchase and own buildings and development projects for long-term gain; institutional investors (such as life insurance companies and international banks), which have the same goal; and small investors, such as wealthy individuals, who often see real estate development as a way to make quick lucrative returns on their investment capital. Also important are the so-called "secondary mortgage markets", such as Fannie Mae, which buy mortgages from banks, package them together, and sell them to Wall Street investors.

2.1.6. Lobbyist

On land uses bills, influential lobbyist typically include the American Public Transportation Association (APTA), the League of California Cities, the California State Association of Counties, the California Building Industry Association, affordable housing advocates such as the California Rural Legal Assistance, the California Association of Realtors, the California Business Properties Association, and environmental groups such as the Sierra Club, National Ressources Defense Council (NRDC), the California League of Conservation Voters (CLCV).

The opposition of any one of these groups can be enough to kill a bill. Sometimes they neutralize each other's impact, meaning that a successful bill is likely to be a cautious one.

2.1.7. Citizen groups

This category of actors includes notably homeowner associations, environmentalists such as the Greenbelt Alliance, university members, advocacy groups such as the San Francisco Planning Urban Research Association (SPUR), think tanks such as the Public Politic Institute of California (PPIC), the Center for Clean Air Policy (CCAP), historic preservation advocates, who become politically involved in the planning process in order to further their group's agenda, rather than private business reasons.

On many projects, city governments require an extensive public review process, with lots of citizen participation. If negotiations take place between a developer and a city, citizen groups have a seat at the table.

2.2. Funding Capacities of Federal, State, Regional and Local agencies

Funding for transportation projects comes from a variety of sources, including federal and state gas taxes, county-level transportation sales taxes, local impact fees, and transit agency fares. In order to ensure equality across different transportation modes and geographical areas, state and federal revenues are allocated by formula to funds dedicated to specific purposes. Generally speaking, federal agencies program funding for earmarked projects and discretionary transit grants, CalTrans programs state and federal dollars dedicated toward construction and maintenance of the state highway system, MPOs program the majority of state and federal funds that are dedicated toward transit and federal funds for road improvements, and counties and cities program state funding for road improvement and self-help revenues. Figure 2 (Rose, 2010) shows a summary of the funding sources and their primary uses, organized by the agency that decides how funds are used.

3. HISTORY OF ELABORATION OF SB 375

3.1. Part of CARB's scoping plan

SB 375 emerged as a way to help meet greenhouse gas reduction goals under California's landmark Global Warming Solutions Act (AB 32, Nunez, 2006). AB 32 creates a tough performance-oriented environmental policy target for California which will affect nearly every economic sector and area in the state. The law calls for reducing greenhouse gas emissions to 1990 levels by 2020. In addition, Governor Schwarzenegger signed Executive Order S-3-05 in 2005, calling for even larger emissions reductions by 2050, to 80% below 1990 levels. Achieving this reduction means cutting approximately 30% from business-as-usual emission levels projected for 2020, or about 15% from current emission levels (CARB, 2008).[14]

With transportation-related emissions the largest single source of greenhouse gas emissions in the state, at 38%, many of the Scoping Plan's proposed measures address transportation (CARB, 2008). To address these emissions, CARB has adopted a three-pronged strategy—reducing greenhouse gas emissions from vehicles, reducing the carbon content of the fuel these vehicles burn, and reducing the miles these vehicles travel (VMT). SB 375 addresses the third of CARB's strategies – reducing VMT. As the graph below shows, even with much greater fuel efficiency and low-carbon fuels, California will not be able to achieve its climate goals unless it can reduce the rate of growth in vehicle miles traveled (VMT). Because of the growth in VMT, CO_2 emissions never drop to 1990 levels and resume rising after 2020. Therefore, the issue was not "if" land use and transportation policy were going to be connected to reducing greenhouse gas emissions but "how" and "when." The issue was not "if" a governmental entity would regulate the car and light truck sector in order to reduce greenhouse gas emissions – the CARB already has that authority under AB 32 – but "how" and "when."

> "It is important to emphasize the long-range benefits of land use and transportation strategies, especially in helping California reach its 2050 goal of 80% below 1990 levels. The benefits of integrated land use and transportation strategies accumulate over time as new development patterns become a larger and larger part of the overall regional picture. Population is estimated to increase by 13% between 2010 and 2020, but is projected to increase 52% by 2050. The impact of land use and transportation strategies may be modest by 2020, but if we begin now, the accumulation of benefits over the next 20, 30, 40 years can result in very significant benefits compared to business as usual." (Climate Change Scoping Plan Appendices, California Air Resources Board, December 11, 2008)

14. In December 2007, the California Air Resources Board ARB approved a greenhouse gas emissions target for 2020 equivalent to the state's calculated greenhouse gas emissions level in 1990. The 2020 target of 427 million metric tons of carbon equivalent ($MMTCO_2E$) requires the reduction of 169 $MMTCO_2E$, or approximately 30%, from the state's projected 2020 emissions of 596 $MMTCO_2E$ (business-as-usual) and the reduction of 42 $MMTCO_2E$, or almost 10%, from 2002-2004 average emissions.

Most of the transportation-related emissions reductions that CARB proposes to achieve in the Scoping Plan come from the first two strategies – improving the efficiency of vehicles and reducing the carbon content of the fuel - accounting together for 27% of all targeted GHG emissions reductions by 2020 (CARB, 2008). By contrast, "regional transportation-related greenhouse gas emissions reductions targets," which are to come from SB 375-related activities, are projected to reduce emissions by 5 million metric tons of carbon equivalent, or 3% of all GHG emission reductions in the Scoping Plan.

To some degree, this imbalance reflects the time frame of the Scoping Plan, which extends to 2020. Changes to land use and transportation infrastructure such as envisioned in SB 375 take a long time to implement. The technology related strategies are expected to produce more immediate effects. However, CARB also recognizes that over the long run, the SB 375 component will be increasingly important for achieving emissions reductions. Although these changes will take time, getting started now will help put California on course to cut statewide greenhouse gas emissions by 80% in 2050 as called for by Governor Schwarzenegger (CARB, 2008).

The importance of "getting started now" on reducing VMT was emphasized in research by the California Energy Commission (CEC, 2007). The CEC projects that over the long run, continuing increases in per capita VMT in the state will erode the GHG emissions reductions that can be achieved through technology alone. The CEC estimates that fuel and vehicle efficiency standards implemented to comply with AB 32 will result in GHG emissions from transportation that are 15% above the required level in 2030 instead of substantially below, as needed in order to reach the levels mandated by 2050 (CEC, 2007). These long-term consequences make SB 375 especially critical in helping California achieve post-AB 32 reductions, past 2020.

3.2. Evolved from regional blueprint planning

The planning process outlined in SB 375 was not created from a blank slate; instead it evolved directly from the blueprint process that emerged in the late 1990s, in the state's four largest metropolitan regions (the Los Angeles, San Francisco Bay, San Diego, and Sacramento areas). It was a new approach to developing land use projections for RTPs, linked more closely to local land use planning. By 2004, these four regions' MPOs had each adopted a blueprint (Barbour and Teitz 2006). Blueprint planning utilizes a coordinated outreach process—called a visioning process—to develop a regional consensus on a preferred course of future development. This preferred scenario is chosen through a coordinated series of workshops held around the region for public officials, various other stakeholders, and the public. At the workshops, hands-on techniques, including computer modeling, are used to consider alternative land use and transportation scenarios for localities and the region. The visioning process culminates in adoption of a "preferred scenario" for future development—a scenario which has generally included more compact development than under status quo local plans and policies.

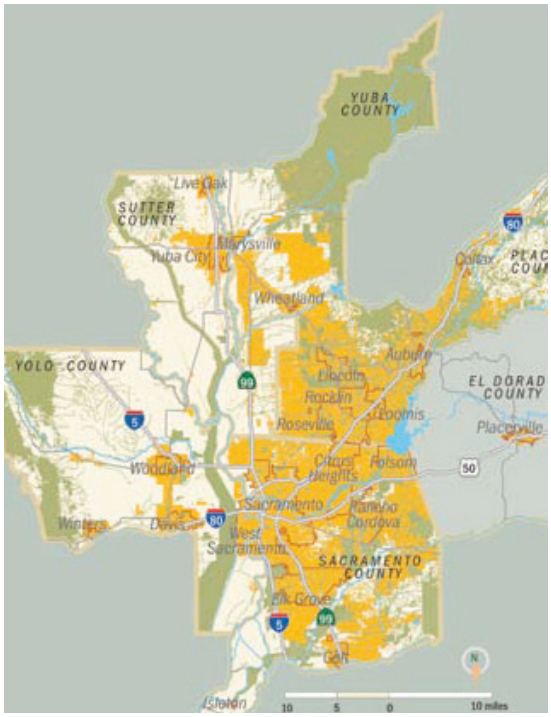
Three main reasons explain why California's MPOs developed the blueprint approach by the late 1990s. First, activists and community leaders were pressuring the COG/MPOs to address growthrelated problems. Second, federal and state reforms had devolved authority and responsibility for transportation planning to the regional level, while, and that's the third reason, also strengthening air quality mandates.[15] The reforms provided the COG/MPOs with a huge new carrot—the authority to "program" billions of dollars in transportation investments—but also a big stick as regional transportation plans were now required to conform to regional air quality plans. Blueprint processes helped COG/MPOs meet their new responsibilities by attaining air quality conformity more easily and also enabling more efficient transportation investments.

To accomplish this, blueprint planning inverted the traditional relationship between local land use and regional transportation planning. In the traditional planning model, local land use choices were taken as a given, and then transportation investments were identified to improve mobility. By contrast, blueprint planning considers local land use choices in a regional context, and even re-orients them to support efficient transportation investments.

By the mid-2000s, blueprint planning was gaining attention at the state level as a promising approach for addressing various growth-related issues, including a housing affordability crisis and overtaxed infrastructure facilities. Blueprint planning gained credibility as a venue for helping address these concerns through better planning

15. The federal Intermodal Surface Transportation Efficiency Act (ISTEA), passed in 1991, required MPOs to take the lead in developing RTPs. In 1997 the state completed its own form of devolution through passage of Senate Bill 45, which provided regional transportation planning agencies with authority to program state capital investment funds for transportation allocated for metropolitan areas—75% of all such funds statewide.

Figure 4. Blueprint Scenario in Sacramento: urban footprint

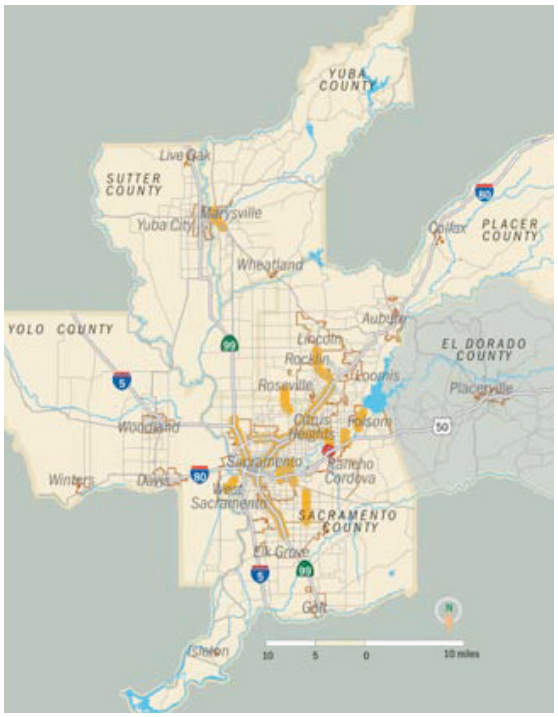


4a : Business-as-Usual Urban Footprint Forecast for 2050

4b: Urban Footprint Under Preferred Blueprint Scenario

Figure 5. Blueprint Scenario in Sacramento: urban footprint: Traffic congestion

5a: Traffic Congestion From Business-as-Usual Transportation



5b: Better Planning Can Lead to Reduced Congestion

Table 3. SB 375 timeline

Timemine	
Jan. 31, 2009 :	ARD appoints the Regional Targets Advisory Committee.
June 1, 2009 :	Clean Air Act attainment area regions, which are required to adopt Regional Transportation Plans every five years, can elect ton adopt the plan every four years by June 1, 2009.
Sept. 20, 2009 :	The Regional Targets Advisory Committee recommends to ARB factors be considered and methodologies to use te set GHGs.
June 30, 2010 :	ARB releases draft GHG tragets for each region.
Sept. 30, 2010	ARB releases the GHG tragets for each region for both 2020 and 2035. ARB updates these targets every eight years.
Approximate Timeframe when Regional Transportation Plan Updates Will Include SCSs[7]	
2011 :	Fresno County, Kern County, Madera Contry, Merced County, Tulare County, SANDAG, San Joaquin Council of Government; Stanislaus County.
2012 :	Association of Monterey Bay Area Gouvernments (AMBAG), Sacramento Area Council of Governments (SACOG), Santa Barbara County, SCAG.
2013 :	Butte County, Metropolitan Transportation Commission/Association of Bay Area Governments (ABAG), San Luis Obispo County, Shasta County.

Source: Garrett, C., 2009, Addressing Climate Change Through Land Use and Transportation Planning: California's SB 375 and SB 732 – A Legislative Trend ?, Bloomberg Finance L. P.

coordination and as a politically palatable approach in a state where "top-down" growth management policies often meet resistance. After AB 32 was passed, state lawmakers looked to the blueprint process as a useful vehicle for helping achieve climate policy goals.

In particular, SB 375 builds upon the leadership of the Sacramento region and its successful blueprint elaboration. With extensive public participation, the Sacramento Area Council of Governments (SACOG) designed a regional blueprint that provided the same number of housing units and jobs, and served the same population as did the business-as-usual scenario, yet with a much smaller urban footprint.

In contrast, the map in Figure 4b shows the smaller urban footprint of the new scenario. It serves the same population but occupies 360 square miles less land. Not only does the preferred scenario occupy much less land, but because of a much better (and cheaper) transportation network, it also reduces congestion. Figure 5a shows the congestion resulting from the business-as-usual scenario, and Figure 5b shows how this congestion could be reduced.

3.3. Emergence from the "policy soup" (Kingdon): the Impossible Coalition

SB 375 was sponsored by environmental groups and gained the support of local governments, builders, affordable housing advocates, major employers, and labour unions. This coalition was not easily assembled. That it came together at all is a tribute to the political leadership of the bill's author, Senator Darrell Steinberg. It also came about because parties were willing to face new realities. AB 32 had been passed and the state was poised to enact far-reaching policies to reduce greenhouse gas emissions. The present land use system was broken and in need of reform. By focusing SB 375 on an open process and incentives rather than complex mandates, all the interests were able to realize gains: The Air Board was given a role to set targets for land use and transportation planning. The funding incentives embedded in the regional transportation plan were employed. Adjustments to the California Environmental Quality Act (CEQA) were made. The housing element process was placed on a longer schedule to coincide with transportation planning and was made more enforceable. SB 375 enjoyed a process of principled compromise that can produce more widespread success in the legislative arena. Reaching agreement on complex, large-scale, and controversial issues is the strongest path but also critical challenge for durable achievements.

A 2007 poll by the National Association of Realtors shows strong public support for growth, land use, and transportation issues:

- 71 % are very concerned about the impact of development on climate pollution.
- 57 % agree that "business and homes should be built closer together" so stores and shops are within walking distance.
- 61 % agree that new home construction should be limited in outlying areas and encouraged in very urban areas.
- 81 % want to redevelop older areas rather than building new ones.
- 83 % support "building communities where people can walk places and use their cars less."
- 88 % support more public transportation.

4. ESTABLISHMENT OF REGIONAL TARGETS

4.1. Process

SB 375 requires CARB to set regional targets by September 30, 2010 (draft targets will be released to the regions by June 30). The target may be expressed in gross tons, tons per capita, tons per household, or in any other metric deemed appropriate by CARB, and must be set for 2020, 2035 and 2050. The Scoping Plan states that 5 million metric tons (MMT) of emissions will be reduced as a result of transportation related planning programs, or almost 3% of the 174 million metric ton reduction needed to achieve AB 32's 2020 target.[16] This number, however, is more of a placeholder as the Scoping Plan states that the total target "will ultimately be determined during the SB 375 process."

Giving the Air Board a role, any role at all, in land use and transportation planning is one of the innovations of SB 375, and understandably it raised concerns. To address those concerns, the bill includes very substantial process provisions. During development of the bill, these provisions were colloquially referred to as creating an "iterative process." In other words, the process does not consist of parties simply presenting their concerns to the Air Board. Instead, there are a series of steps so that there is an interaction between the Air Board and interested parties in a variety of ways.

Regional Targets Advisory Committee

As a first step, on January 23, 2009, the Air Board appointed the regional targets advisory committee (RTAC). The committee is made up of representatives from the League of California Cities, California State Association of Counties, MPOs, affected air districts, planners, homebuilders, affordable housing organizations, environmental justices organizations, local transportation agencies, and others. The RTAC was tasked with recommending "factors to be considered and methodologies to be used" for setting the targets. The committee made its report to CARB by September 30, 2009.

Setting the regional targets involves a host of complicated issues. Not only must the Air Board establish a target to be achieved in total by the metropolitan planning organizations (MPOs), but also it must allocate that total among the regions. The Air Board will no doubt consider the projected growth rates of the various regions along with how to handle the knotty issue of interregional travel. In the San Francisco Bay Area in particular, there are a large number of commuters who live outside the region but drive to one of many employment sites within the region. To a lesser extent, that problem also affects the other three major metropolitan regions of Southern California, San Diego, and Sacramento. The RTAC will offer advice on these issues, and the Air Board must "consider" its advice.

Regional Consultation

In addition to creating the regional targets advisory committee, SB 375 provides that the Air Board shall "exchange" information with each affected MPO and air district. Each MPO can recommend what its target should be. The MPO must hold at least one public workshop within its region after receipt of the report from the RTAC. The Air Board is also required to release draft targets for each region by June 30, 2010. This will give each region and interested parties a reasonable period to see the direction the Air Board is intending to go, and will allow enough time to prepare comments prior to the final adoption of targets by September 30, 2010.

Target Adjustment

Finally, the bill recognizes that adjustments to the targets may be needed. Once set, the targets must be updated every 8 years, which is consistent with the new RHNA planning cycle and two RTP planning cycles in non-attainment areas. The board can also, at its discretion, revise the targets every four years based on changes in fuel efficiency, use of low carbon fuels, or other factors that CARB can take into account in setting the target. Before revising or updating the regional targets, CARB must engage the primary stakeholders (Dept. of Transportations, MPOs, air districts, and local governments) in a consultative process. The MPO may, at its discretion, recommend to the ARB a target for the region for CARB's consideration.

4.2. Methods and tools

Use of Empirical Studies

RTAC committee underlines that empirical studies have a vital role to play in setting greenhouse gas reduction targets and designing strategies to meet those targets through changes in land use,

16. Cars and light trucks account for approximately 31% of all GHG emissions in California. The Scoping Plan outlines programs that will reduce emissions by cars and light trucks by a proportional 33%. These policies include reductions from light-duty vehicle standards (31.7 MMT), low carbon fuel standards (15 MMT), vehicle efficiency measures (4.5 MMT) and regional transportation related GHG targets (5 MMT). Together, these measures total 56.2 of the 169 MMT in needed reductions.

transportation infrastructure and other transportation policies. The data derived from these studies can help define not only the expected range of VMT and greenhouse gas reduction that might result from various land use and transportation strategies, but also effective policies and practices that planning agencies throughout the country have found to be ambitious and achievable.

The most immediate use of empirical data is identified in this Committee's recommendation that ARB, with expert consultation, develop a Best Management Practices (BMP) list, and enhance it by providing, if available from the literature, a range of elasticities associated with each policy or practice. The empirical data would then be used to develop a BMP spreadsheet tool based on the BMP list. Empirical evidence should also be used to calibrate and validate regional and state travel models.

Use of modelling

The RTAC committee considers the use of models relevant for two major implementation issues:

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

Each of the 18 MPOs in California uses and maintains a travel demand model for development and evaluation of its RTP. All MPOs have staff assigned to maintenance and operation of their travel demand models, though at widely varying levels, and all use consultants and outside contractors to periodically update and improve their travel demand modeling tools. Given that MPOs have invested millions in travel demand models that have an integral role in land use and transportation planning to date, RTAC committee considers that MPOs and ARB should leverage these long term investments by using travel demand models for SB 375 implementation.

However, in the course of RTAC discussion, a detailed self-assessment of travel demand models was prepared and presented to the Committee. This assessment revealed significant variations among the travel demand models in use by MPOs, both in terms of model capabilities and key assumptions used by the models. Accordingly, the RTAC committee concluded there was a need to augment travel demand models with other methods to achieve reasonable levels of sensitivity for SB 375 implementation purposes. These other methods include:

- Best Management Practices (BMPs): wherein a comprehensive list of greenhouse gas reduction policies and practices would be assembled, and a BMP spreadsheet tool would be developed for determining the level of greenhouse gas reduction that could be achieved by implementing a particular policy or set of policies.
- Post processor tool wherein MPOs would apply the tool to adjust outputs of their travel demand model such that they account for areas where the model lacks capability, or is insensitive to a particular policy or factor.

Best Management Practices

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

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

Base Year

The RTAC committee recommends a current base year of 2005. A current base year is preferred over a future base year since it relies on recent, existing information and is less sensitive to varying assumptions. Although 1990 was discussed as a potential base year to be consistent with AB 32, MPO representatives indicated regional transportation and land use data are not of a good enough quality to support its use as a base year. Additionally, many of the most recent RTPs and Blueprint scenarios have modeled year 2005 as a base year. Use of a 2005 base year also helps give regions credit for actions already taken to reduce greenhouse gas emissions.

Target Metric

The RTAC committee recommends that ARB express the targets in terms of a% reduction in per capita greenhouse gas emissions from 2005 levels. This metric is preferred for its simplicity, since it is easily understood by the public, can be developed with currently available data, and remains a widely used metric by MPOs today. In addition, this form of metric has the advantage of directly addressing growth rate differences between MPO regions. The relative characteristic of the

Figure 6. California's GHG emissions (2002 – 2004 average)

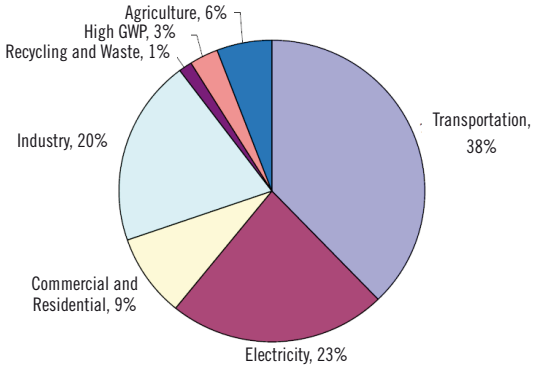
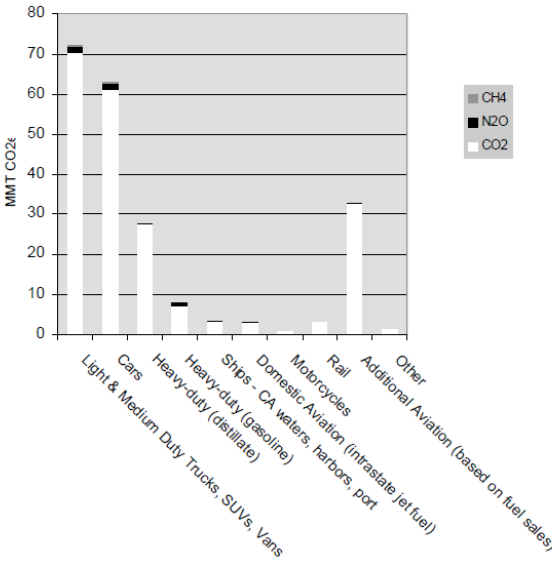


Figure 7. GHG by transportation mode



metric ensures that both fast and slow growth regions take reasonable advantage of any established transit systems and infill opportunity sites to reduce their average regional greenhouse gas emissions. Furthermore, this target metric also helps give regions some "credit" for early actions taken to reduce greenhouse gas emissions.

2020 and 2035 targets

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

4.3. Regional Variation in the target setting process

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

4.4. Development of tools

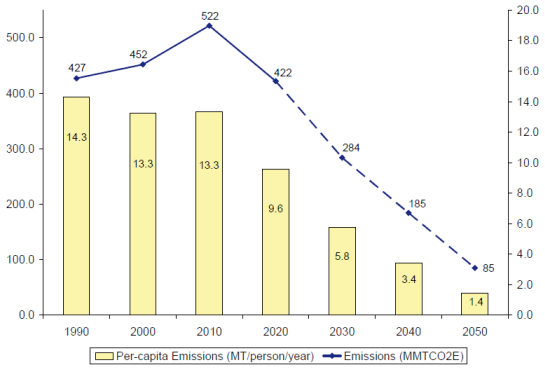
In putting forward this recommendation, the RTAC committee recognizes that due to the statutory timeframes for target setting, the most immediate need is the development of a list of BMPs. This BMP list should include data from empirical studies, blueprints, and modeling from MPOs that identifies the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

The RTAC committee's recommendation for the development of a BMP list is tied closely with its recommendation that ARB also undertake an effort, with expert consultation, to convert the BMP list into an analytical BMP spreadsheet tool that could provide an assessment of what greenhouse gas reductions may be possible by implementing some or all of the policies and practices identified in the BMP list. The tool should have the capacity to account for significant regional differences and the synergistic interaction of multiple BMPs. This

Table 4. 2002 – 2004 average emissions and 2020 projected emissions ($MMTCO_2E$)

Sector	2002-2004 Average Emissions	Projected 2020 Emissions (BAU)
Transpotation	179.3	225.4
Electricity	109.0	139.2
Commercial and Residential	41.0	46.7
Industry	95.9	100.5
Recycling and Waste	5.6	7.7
High GWP	14.8	46.9
Agriculture	27.7	29.8
Forest Net Emissions	-4.7	0.0
Emissions Total	469	596

Figure 8. Emissions trajectory towards 2050



Greenhouse Gases by Transportation Mode (CARB Inventory for 2004)

functionality would enhance ARB's target setting process and would assist MPOs in model and scenario development.

The RTAC committee recognizes that travel demand and land use models, including off-model post-processors, are an essential, inextricable piece of the regional transportation planning process. Since the Committee assumes that these modeling systems will be used by all the MPOs throughout SB 375 implementation, regional and statewide model transparency, consistency, and plans for improvement are a critical component of the Committee recommendations. RATC committee considers that each MPO should develop a multi-year program of improvements needed to address any modeling needs. Improvements should describe the basic change which would be made to the MPO travel demand model, identify what data would be required to support the improvement, provide order-of-magnitude cost estimates, and identify any phasing issues or dependencies on other projects in the program.

5. REACHING TARGETS

5.1. Californian GHG emissions per sector and reduction targets: transportation is a key issue

5.1.1. Californian GHG emissions

Transportation sector – largely the cars and trucks that move goods and people – is the largest contributor with 38% of the state's total greenhouse gas emissions. If no action is taken, greenhouse gas emissions in the transportation sector are expected to grow by approximately 25% by 2020 (an increase of 46 $MMTCO_2E$).

California drivers used an estimated 18.1 billion gallons of motor fuel to travel 330 billion miles in 2005—a 15% increase since 1990—at an estimated cost of $44 billion. (Mizutani, C., *Transportation Fuels, Technologies, and Infrastructure Assessment Report. Integrated Energy Policy Report*, California Energy Commission, Sacramento, CA, 2003, p. 86.)

The 2020 business-as-usual forecast does not take any credit for reductions from measures included in the AB32 Scoping Plan, including the Pavley greenhouse gas emissions standards for vehicles, full implementation of the Renewables Portfolio Standard beyond current levels of renewable energy, or the solar measures.

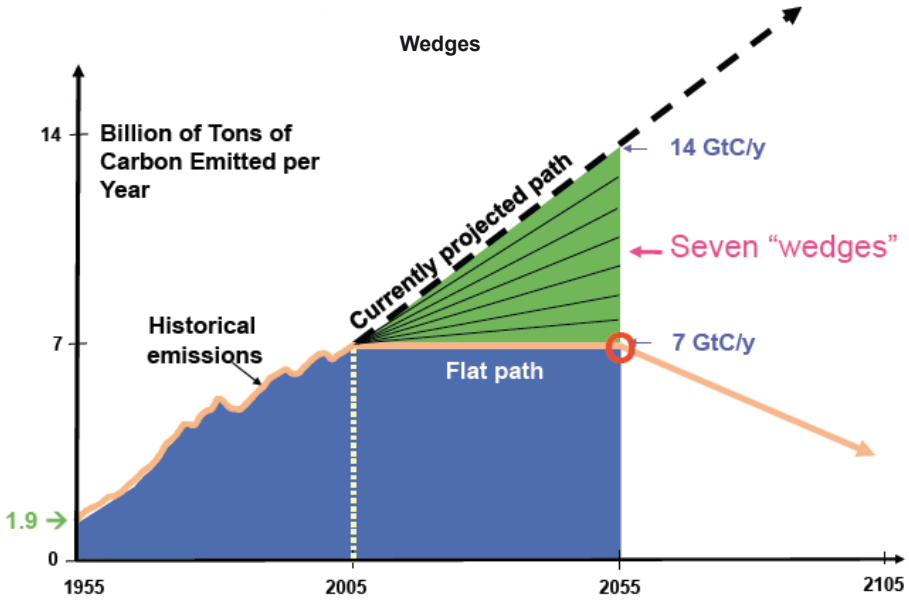
5.1.2. Californian GHG emissions reduction targets

In December 2007, ARB approved a greenhouse gas emissions target for 2020.

The 2020 target of 427 $MMTCO_2E$ requires the reduction of 169 $MMTCO_2E$, or approximately 30%, from the state's projected 2020 emissions of 596 $MMTCO_2E$ (business-as-usual) and the reduction of 42 $MMTCO_2E$, or almost 10%, from 2002-2004 average emissions.

Reducing greenhouse gas emissions to 1990 levels means cutting approximately 30% from business-as-usual emission levels projected for 2020, or about 15% from today's levels. On a per-capita basis, that means reducing our annual emissions of 14 tons of carbon dioxide equivalent for every man, woman and child in California down to about 10 tons per person by 2020.

Figure 9. Wedges analysis



Getting to the 2020 goal is not the end of the State's effort. The long range goal is reflected in California Executive Order S-3-05 that requires an 80% reduction of greenhouse gases from 1990 levels by 2050.

The 2020 emissions cap in the cap-and-trade program is preserved at the same level as in the Draft Scoping Plan (365 $MMTCO_2E$). The measures listed in Table 4 lead to emissions reductions from sources within the capped sectors (146.7 $MMTOCO_2E$) and from sources or sectors not covered by cap-and-trade (27.3 $MMTCO_2E$).

5.2. Housing market trends, an open-window for smart growth

The market is helping reduce sprawl development. Looking forward to 2030 and, with less certainty, to 2050, experts and analysis of the current housing market trends conclude that housing preferences and travel patterns may change in ways that support higher-density development and reduced VMT, although it is unclear by how much. In California from 1998 through 2004, compact development (attached units plus small lot detached) constituted 40% of the market. In 2008, attached units alone accounted for almost 50% of the units developed.[17]

These market shifts are not due simply to the financial crisis. They are also the result of long term demographic changes that are driving housing demand. Five main factors lead to this open-window for smart growth:

- The aging of the population, in particular the aging of the Baby Boom generation, will have a profound impact on the housing market for many decades once the leading edge of the Boomers passes the age of 65 in 2010. The Boomers will begin to sell off their large supply of low-density, suburban housing as they downsize to smaller units in more compact settings or move to retirement communities. They will also drive less as they age. The jury is out, however, on whether this first truly suburban generation will leave the suburbs for center city locations or age in place or near family members.
- The foreign-born share of the population is projected to continue to grow and immigrant populations, particularly Hispanics, the dominant group in California, have different housing preferences and travel patterns from those of native-born populations. Recent immigrants tend to live in multifamily housing, Hispanics locate disproportionately in central cities, and all immigrant groups are heavy users of public transportation where it is available. As they become assimilated, however, immigrant groups tend to converge toward the population mean in their housing and transportation preferences.

17. Ewing, R., University of Maryland and Nelson, A., University of Utah, 2008, "CO_2 Reductions Attributable to Smart Growth in California."

Table 5. Wedge Analysis of Californian transportation laws

	Summary	Estimated emission reduction ($MMTCO_2E$)	% of Transportation emission reduction target	% of Californian emission reduction target
Pavley + Pavley II	GHG standards for post-2016 model year vehicles	31,7	50,9	18,8
LCFS	Require the carbon efficiency to decline 10% by 2020	15	24,1	8,9
Smart Growth		5	8,0	3,0
Vehicle efficiency measures	- Tire inflation - To reduce engine load via lower friction oil - To reduce the need of air conditioner use	4,5	7,2	2,7
Goods movement	Port electrification	3,7	5,9	2,2
Medium/heavy vehicle		1,4	2,2	0,8
Truck and trailers to be retrofitted with devices that reduce aerodynamic drag		0,9	1,4	0,5
hybridization		0,5	0,8	0,3
High Speed Rail		1	1,6	0,6
Total		**62,3**	**100**	**36,9**

- Young adults who are entering the housing market represent another potential market for more compact development. Although less numerous than the Boomers, they appear to be exhibiting stronger preferences than their predecessors for urban living.
- In the 1960s, 48% of households consisted of couples with at least one child; today that number is 33%. By 2030, 73% of households will consist of single adults or couples without children.[18]
- The future may also be characterized by sustained higher real energy prices, which could remain well outside the norm of the past 30 years. Evidence from past energy spikes suggests that in the short and medium terms, motorists cut back on the number of trips they take and buy more fuel-efficient vehicles, the latter effect predominating. Whether they would move jobs or residences to reduce travel and energy costs has not been observed because high energy prices have not persisted. As long as incomes continue to rise, however, and transportation costs remain a relatively small share of household budgets on average, high energy prices will be only one of many factors that drive residential and employment location decisions.

In summary, a population that is aging and includes more immigrants and young adults with urban preferences is likely to be more inclined to live in more compact developments, own fewer automobiles, drive less, and use alternative modes of transportation. Should they occur, sustained higher energy prices would reinforce these trends.

Taking advantage of this potential shift in housing preferences and travel patterns will require addressing numerous impediments to change. Local zoning regulations, particularly regulations that restrict density levels and mixing of land uses, represent one of the most significant impediments to more compact, mixed-use development. Street designs and parking requirements focused on automotive travel reinforce automobile-oriented development. The sixth part will focused on these barriers to smart growth.

5.3. Wedges analysis of CARB Scoping Plan

The wedge analysis concept was first developed by Rob Socolow and Stephen Pacala at Princeton University. This approach focuses on ways to reduce emissions from a "business-as-usual" scenario. With wedges, a multitude of projects combine to reduce overall carbon emissions, a task that at times can seem impossible. Individually, the wedges are difficult but achievable. This approach decomposes the climate change mitigation challenge into a limited set of tasks.

If no action is taken, greenhouse gas emissions in the transportation sector are expected to grow by approximately 25% by 2020—an increase of 46 $MMTCO_2E$—from 179.3 $MMTCO_2E$ to 225.4 $MMTCCO_2E$.

18. Nelson, A., 2007, "Preparing for the Next Building Boom," FAICP http://www.mi.vt.edu/uploads/Nelson%20Smart%20Growth%20Conf%202-9-07.

Table 6. Wedges analysis : ASIF summary

	Summary	Estimated emission reduction ($MMTCO_2E$)	% of Transportation emission reduction target	% of Californian emission reduction target
A +S		6	9,6	3,6
A				
Smart Growth		5	8	3
S				
High Speed Rail		1	1,6	0,6
I		41,3	66,2	24,5
Pavley + Pavley II		31,7	50,9	18,8
Vehicle efficiency measures		4,5	7,2	2,7
Goods movement		3,7	5,9	2,2
Medium/ heavy vehicle		1,4	2,2	0,8
F		15	24,1	8,9
LCFS		15	24,1	8,9
Total		**62,3**	**100**	**36,9**

Emission reduction = A x S (9,6%) x I (66,2%) x F (24,1%)

Table 7. Estimates of 2020 GHG reduction

	VMT reduction per capita	CO_2 Reduction ($MMTCO_2$)
ARB Scoping Plan		8
- compact development	4%	5
- PAYD* - congestion pricing - public education		1 1 1
Ewing 2008 (Growing cooler)	17%	11,4 – 14,3
Compact development		4,1 – 5,7
Smart transportation policies: - shifts in funding from highways to transit - road user charges		4
- PAYD - congestion pricing - public education		1,3 – 2,6 1 1
Sweeney and Weyant (2008)		7,1
Rodier (2008)		
- Employee parking pricing - PAYD - Congestion pricing - Increased transit investment - Compact development - LU + Transit - LU + Transit + pricing	1% 4 – 5% 2 – 3% 0,1 – 1,1% 2% 2 – 6% ?	
Center for Clean Air Policy (2009)	10%	

* PAYD («Pay As You Drive») is a type of automobile insurance automobile insurance whereby the costs of motor insurance motor insurance is calculated dynamically, typically according to the amount you drive. There are three types of usage based insurance: 1) Cover is based on the odometer reading of the vehicle; 2) Cover is based on the number of minutes the vehicle is being used as recorded by a vehicle-independent module transmitting data via cellphone or RF technology; 3) Cover is based on other data collected from the vehicle, including speed and time-of-day information in addition to odometer readings.

Table 8. Ewing's estimates of GHG reduction

	CO_2 Reduction (million metric tons)
VMT Reduction with Compact Development	4.1 - 5.7
VMT Reduction with Smart Transportation Polices	4.0
VMT Reduction with Measures Under Evaluation	3.3 - 4.6
Total	11.4 - 14.3
Building Energy Saving	3.0 - 3.6
Total with Bulding Energy Savings	14.4 - 17.9

The 2020 target—i.e. the sum of transportation-related measures included in the scoping plan presented by CARB in October 2008—is to reduce transportation GHG emission by 62,3 $MMTCO_2E$ —i.e. to limit transportation GHG emission at a level of 163.1 $MMTCO_2E$. Therefore, the 2020 target means cutting by 20% from business-as-usual emission levels projected for 2020, or about 9% from today's levels.

The A.S.I.F. framework (Schipper et al., 2000) is the world recognized methodology to break down the influence of urban policies on transportation energy consumption drivers. Transportation energy use is a function of total activity (A), mode share (S), fuel intensity (I), and fuel type (F) (thus, ASIF). However this function is not as simple as it looks: Zegras (2007) shows how "multiple factors influence each of the ASIF components with many affecting more than one component. "

It highlights that there are multiple factors influencing each of the ASIF components, with many affecting more than one component.

A = f [population, demographics (age, gender, etc), **income** (trip rates and distance tends to rise with income), **economy** and its composition, **urban form and size** (spatial distribution of actors), **etc]**

S = f [income (influence value of time and thus demand for speed, comfort and privacy, vehicle ownership, etc), **motorization rate, infrastructure provision** (affect the willingness to choose

NMT options, availability of certain fixed-transit options, modal attractiveness through effects on reliability), **service provision** (quality), **relative costs** (out of-pocket and perceived costs), **urban form and size** (spatial distribution of actors), **etc]**

I = f [engine type, vehicle load, vehicle age, (government standards), **Driving conditions** (congestion levels), **vehicle occupancy, urban design** (street network type), **etc]**

F = f [fuel type (Life Cycle Analysis), **engine type, vehicle technology, vehicle age, temperature, altitude**, **etc**

5.4. Potential of "smart growth" options

The report from Urban Land Institute (ULI)[19] on this issue emphasizes the importance of smart growth while noting that reduction in GHG emissions due to other measures can be offset by the increase in total VMT in the long run. With increasing population, cities have tended to grow outwards thus increasing the sprawl. Consequently, commuting distances have increased leading to higher VMT and higher emissions. Smart growth was proposed as solution for this problem and is basically anti-sprawl development.

The four chosen references—Ewing (2008); Sweeney and Weyant (2008); Rodier (2009); Center for Clean Air Policy (2009)—to compare AB32 Scoping Plan's figures are the key references used by all stakeholders in the current debate on Californian regional targets for transportation.

5.4.1. Estimates of 2020 GHG reduction

See Table 7.

5.4.2. ARB Scoping Plan

The emissions reduction number presented by ARB in its Scoping Plan is not the statewide metric for regional targets that must be developed as SB 375 is implemented. ARB underline that the emissions target will ultimately be determined during the SB 375 process.

According to ARB Scoping Plan, the possible impacts of land use and transportation policies have been well documented. Therefore ARB estimate of the statewide benefit of regional transportation-related greenhouse gas emissions reduction targets is based on analysis of research results quantifying the effects of land use and transportation strategies. More specifically, ARB Scoping Plan refer to a 2008 U.C. Berkeley study[20] reviewing over 20 modeling studies from California (including the State's four largest MPOs), other states and Europe. The study found a range of 0.4 to 7.7% reduction in vehicle miles traveled (VMT) resulting from a combination of land use and enhanced transit policies compared to a business-as-usual case over a 10-year horizon, with benefits doubling by 2030. ARB calculated based on the U.C. Berkeley study's median value of 4% per capita VMT reduction over a 10-year time horizon.

5.4.3. Ewing (2008) / Growing Cooler

Ewing estimates that CO_2 reductions in the range of 14.4-17.9 $MMTCO_2E$ by 2020 are demonstrably achievable. This estimate includes a reduction of 3.0-3.6 $MMTCO_2E$ from residential energy savings associated with compact development. Excluding these energy savings, we estimate VMT reductions due to certain smart growth policies can achieve a reduction of 11.4-14.3 $MMTCO_2E$.

1) VMT and CO_2 Reduction with Compact Development

Ewing's estimations of CO_2 emissions reduction with compact development are based on the following formula:

Table 9. Ewing's formula to estimate GHG reduction

% Market Share of Compact Development
x
% of Total Development Built between 2010 and 2020
x
% VMT Reduction with Compact Development
x
Ratio CO_2/VMT Reduction with Compact Development
x
Baseline Projection of CO_2 in 2020
=
CO_2 Reduction with Compact Development by 2020

	CARB 2020	Ewing 2020 low	Ewing 2020 high
Compact Marquet Share	30%	50%	70%
% Development/ Redevelopment	25%	25%	25%
% VMT Reduction	30%	30%	30%
Ratio CO_2/VMT Reduction	90%	90%	90%
Baseline CO_2 Projection	115 MMT	120 MMT	120 MMT
CO_2 Reduction	2.3 MMT	4.1 MMT	5.7 MMT

19. Ewing, R., K. Bartholomew, et al. (2007). Growing Cooler: The Evidence on Urban Development and Climate Change. Washington, DC, Urban Land Institute.

20. Rodier, Caroline. U.C. Berkeley, Transportation Sustainability Research Center, "A Review of the International Modeling Literature: Transit, Land Use, and Auto Pricing Strategies to Reduce Vehicle Miles Traveled and Greenhouse Gas Emissions," August 2008.

2. CO_2 Savings with Smart Transportation Policies

Then, Ewing estimates the combined effect of compact development, shifts in funding from highways to transit, and increases in road user charges. He does so by estimating two structural equation models (SEMs) were estimated with data from the Texas Transportation Institute's Urban Mobility database (Schrank and Lomax 2007) : a cross-sectional model for 2005, the last year in the series, and a longitudinal model for the two ten-year periods, 1985 to 1995 and 1995 to 2005.

Ewing finds that the largest potential effect on VMT is that of a fuel price increase (road user charges), second is a slow down in highway expansion, third is an increase in density, and last is an increase in transit service.

VMT Growth under a Low-Carbon Scenario (Chapter 8 of GC)

Table 10. Ewing's estimates of VMT growth

	Elasticites of VMT with Respect to Policy Variables	Change in Annual Growth Rates (% above/below Trend)	Effect on Annual VMT Growth Rate (% below Trend)
Population density	- 0.30	1	- 0.077
Highway lane miles	0.55	- 1	- 0.114
Transit revenue miles	- 0.06	2.5	- 0.046
Real fuel price	- 0.17	2.7	- 0.144

Source: R. Ewing et al., Growing Cooler: The Evidence on Urban Development and Climate Change, Urban Land Institute, Washington, D.C., p. 127.

Then Ewing calculates that, given the elasticities in Table 10, the 1% increase in rate of transit service expansion would be expected to slow VMT growth in California's urban areas by 0.06%, while the 1% growth rate of highway expansion would slow VMT growth by 0.28%. Through 2020, these two changes together would cut CO_2 emissions by 4.0 $MMTCO_2E$.

Elasticities of VMT with Respect to Urban Variables

Table 11. Ewing's estimates of elasticities of VMT

	National Cross Selectional	National Longitudinal	California	Best Estimate
Population	0.97	0.87	0.77	0.95
Real per capita income	0.53	0.54	0.09	0.54
Population density	- 0.21	- 0.15	- 0.15	- 0.30
Highway lane miles	0.46	0.68	0.57	0.56
Transit revenue miles	- 0.08	- 0.02	- 0.01	- 0.06
Transit passenger miles	- 0.07	- 0.03	- 0.01	- 0.06
Real fuel price	NA	- 0.17	- 0.11	- 0.17

Source: R. Ewing et al., Growing Cooler: The Evidence on Urban Development and Climate Change, Urban Land Institute, Washington, D.C., p. 127.

3) Other Transportation Measures Under Evaluation

In addition to these savings from changes in the transportation system, Ewing (2009) considers reductions that could result from changes in the cost of driving, all included in the ARB scoping plan: congestion pricing, Pay-As-You-Drive insurance, and public education programs to reduce vehicle travel (which could include financial incentives to use alternatives as well as educational programs).

The Draft Scoping Plan estimates a reduction of 1 $MMTCO_2E$ from PAYD. A recent analysis by the Brookings Institute estimates reductions of 8% in VMT and 11 $MMTCO_2E$ are possible with PAYD. A more conservative analysis by NRDC estimates that half of California drivers (those who drive the least) would choose PAYD by 2020, if available, and reduce their driving by 4-8%. This would result in a savings of 1.3–2.6 $MMTCO_2E$. Ewing (2008) adopts those latter figures.

Regarding GHG emissions reduction achievable thanks to congestion pricing and public education, because of uncertainties, Ewing adopts the estimates proposed in the Draft Scoping Plan: these programs could each result in up to 1 $MMTCO_2E$ of reductions by 2020.

5.4.4. Sweeney and Weyant (2008)

Sweeney and Weyant (2008) estimate the GHG reductions from smart growth planning by contacting individual agencies and summing up the corresponding numbers from various regions. The total was then found to be 7.1 $MMTCO_2E$. In cases where the exact number for 2020 was not available, the available estimate was scaled down

in order to obtain the approximate reduction in 2020. The following table shows the agency, the population and the VMT in each of the four regions that were included in the above number.

The total VMT for California in 2001 was 1075.5 million vehicle miles and these four regions constituted almost 78% of the total VMT in California.[21] Thus, Sweeney and Weyant (2008) consider that the above number can serve as an estimate for the reductions from smart growth plans for the whole state. In addition to these four regions, the planning agencies for all the regions whose annual VMT was over 10 million vehicle miles in 2001 – i.e. Bakersfield, Fresno, Monterey, Stockton and Modesto - were also contacted for any smart growth initiatives or details on efforts towards AB 32. Of these only the Fresno region planning agency (FRESNOCOG) has conducted a scenario evaluation exercise and has estimates for GHG reductions. The amount, however, is quite low when compared to the reductions projected in the four major regions.

In addition to the reduction in GHG emissions due to smart growth planning, Sweeney and Weyant (2008) consider other transportation related measures such as Intelligent Transportation Systems (ITS) and operational efficiency improvements, changing cement composition for construction of infrastructure, fleet greening, etc. The savings from these measures as reported in the CAT report (2007) is 2.82 $MMTCO_2E$. Thus, Sweeney and Weyant (2008) assume that the total reduction in emissions including smart growth is 9.88 $MMTCO_2E$.

5.4.5. Rodier (2009)

Rodier (2009) reports that currently, most operational regional models in California have limited ability to represent the effects of transit, land use, and auto pricing strategies; efforts are now underway to develop more advanced modeling tools, including activity-based travel and land use models. Therefore, in the interim, there is a need to review the international modeling literature on land use, transit, and auto pricing policies to suggest a range of VMT and GHG reduction that regions might achieve if such policies were implemented.

Her results are:

- Employee parking pricing may result in approximately a 1% reduction in VMT over the 10-year time horizons.
- Pay-as-you-drive insurance policy may produce reductions ranging from 4% to 5% reduction over all time horizons.
- Moderate cordon pricing schemes are likely to reduce VMT by 2% to 3% over time.
- Increased transit investment may reduce VMT by 0.1% to 1% during a 10-year time horizon, and in future 10-year increments, this may increase by a 1 percentage point at the higher reduction level.
- Land-use-only scenarios may reduce VMT by up to 2% in the 10-year time horizon, which may increase by approximately 2 to 3 percentage points at the higher reduction level at 10 year increments.
- Land use and transit scenarios may reduce VMT by 2% to 6% during a 10-year time horizon, and these figures may increase by approximately 2 to 5 percentage points at each future 10-year increment.
- Combined land use, transit, and pricing policy measures would bring significantly greater reductions both in the shorter and longer term time horizons.

However, Rodier (2009) underlines three key limits to these results:

- In general, the results confirm that even improved calibrated travel models are likely to underestimate VMT reductions from land use, transit, and pricing policies. These models simply are not suited for the policy analysis demands in the era of global climate change. However, even the advanced models used in the reviewed studies exhibit limitations. These integrated models use relatively large zones and thus have coarse geographic resolutions, which may overestimate the share of vehicle trips relative to walk and bike trips from transit-oriented development policies.
- The results of the extrapolation analysis illustrate the challenge of implementing land use and transit strategies in a regulatory framework that emphasizes near term compliance. For example, the Sacramento Area Council of Government's blueprint land use and transport plan was simulated over a 50-year time horizon; the extrapolated results, which evenly distribute VMT reduction over time, show a 4.2% reduction in VMT in the 10-year time horizon. However, a much more aggressive scenario, simulated with the improved travel model in the region over a 10-year time horizon, only showed a 0.4% reduction in VMT.
- The analysis of consistent policies across different regions also provides insight into how VMT reduction may vary given existing land use densities and transit infrastructure. For example,

21. Weidner, T. and S. Seskin (2001). California Smart Growth Energy Savings MPO Survey Findings, Parsons Brinckerhoff Report P600-01-021F, California Energy Commission. Sacramento, CA.

Table 12. VMT reduction projected in the four major Californian regions

Municipal Planning Organization	Population (millions)	VMT (million miles)	Counties
Southern California Association of Government (SCAG)	16.5	474.2	Imperial, Los Angeles, Orange, Riverside, San Bernardino, Ventura
Metropolitan Transportation Commission (MTC)	6.9	166.8	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, Solano
San Diego Association of Government (SANDAG)	2.8	131.9	San Diego
Sacramento Area Council of Government (SACOG)	1.9	69.7	El Dorado, Placer, Sacramento, Sutter, Yolo, Yuba
Total	28.0	842.6	
CA total	33.9	1075.5	

analyses of land-use only policies suggest that these policies may be less effective in various European regions and in Washington, D.C. relative to the more sprawling and rapidly growing regions (e.g., Sacramento) where trend land use patterns do not take full advantage of existing transit capacity. The results of the auto pricing policies tend to show greater reductions in VMT in European cities because of higher quality modal options to the auto. As a result, care should be taken in generalizing such results to U.S. cities without high quality alternatives.

5.4.6. Center for Clean Air Policy (2009)

Base on an extensive literature review, Center for Clean Air Policy (CCAP) (2009) reports that the measured, modeled and aspirational per-capita VMT reductions range from 6-50%, with many of the studies falling within the 10-20% range. Based on these studies, CCAP concludes that a 10% reduction in per-capita vehicle miles traveled (VMT) by 2030 is achievable with comprehensive application of best practices.

Measured VMT Reductions

Over the last few decades the Portland, Oregon metropolitan region has implemented smart growth policies, improved transportation choices, and collected data to measure its success. In the 1970s, the city had a serious air quality problem and rising car dependence. Leaders shifted funds designated for construction of a new freeway to expanding public transportation. The region adopted an urban growth boundary, a parking cap for the downtown, and urban design standards. The region has invested relatively little in road capacity expansion since the mid-70s, instead focusing on maintaining its existing roads and developing a well integrated light rail, bus, and streetcar network with pedestrian and bicycle friendly streets. Portland and adjoining suburban Multnomah County adopted a climate action plan in 1990, taking steps to reduce traffic growth, expand travel choices, and support smarter growth. Since 1990, only 8% of the housing growth in the Portland region has gone beyond the urban growth boundary. Since 1990, the region developed 48 miles of light rail and streetcar, boosted the number of frequent bus routes from 4 to 16 and seen a 90% increase in transit use. Between 1999 and 2005, the region added 40% more miles to the bikeway network and cycling has increased five-fold since 1990. While national VMT per capita grew by 8% between 1990 and 2007, in the Portland-Vancouver region VMT per capita fell by 8-10%. During this same time, the region brought its GHG emissions back to 1% above 1990 levels by 2008, while population grew by 14% and the region grew as an economic center.

In Arlington, Virginia, extensive transit-oriented development policies intended to increase density along transit lines expanded travel and housing options. County data indicate that population has grown more than 1% per year with no growth in VMT. This would be equivalent to a 20-30% reduction in VMT per capita from 1980 to 2005. The County is pursuing household VMT data to enhance their measurement of VMT per capita. Residents take 47% of commute trips via transit, walking, or biking compared to 29% for the region, and only 12% households are car-free, compared to 4% in the region. And, as discussed in section 2, by attracting businesses, Arlington has reaped extensive economic benefits and increased tax revenues.

The Atlantic Station development was projected to reduce per capita VMT by 30%, and initial site review indicates a 59% reduction in resident VMT and a 36% reduction for employee VMT.

Modeled VMT Reduction Projections

Sacramento incorporated the Preferred Blueprint land use scenario into their Metropolitan Travel Plan, and found that while increasing population will cause total VMT to climb, VMT per capita will decrease between 6 and 10% through 2035 due to

the closer destinations and alternative transportation choices in the Blueprint plan.

Assessment of comprehensive travel demand management policies using integrated transportation and land use models identified opportunities to cut VMT by 20% over a 20 year planning horizon by investing more in transit, less in new roads, by giving consumers cash savings instead of driving subsidies, and promoting transit-oriented development.[22]

The McKinsey and Company study for Georgia, which included a number of transit, system efficiency and TDM measures, projects a 7% reduction in VMT per capita for the Atlanta metropolitan area, from 2010 to 2030.

The Federal Highway Administration has summarized findings from many regional studies looking at the potential of various pricing and transportation management strategies to cut GHGs, identifying multiple strategies — especially in the pricing arena - that individually can yield VMT and GHG reductions of 10% or more.[23]

5.5. Eco-effectiveness of "smart growth options"

5.5.1. Center for Clean Air Policy (2009)

According to CCAP (2009), a number of studies found that significant savings can be achieved in terms of infrastructure costs, travel costs, energy costs and other costs that can be quantified.

In Atlanta, CCAP calculates that the Atlantic Station project will reduce CO_2 by a total of 0.63 $MMTCO_2$ over 50 years at a net cost savings, because municipal tax revenues from the project will be greater than what is required to pay back the initial project loan.

A McKinsey analysis for Georgia concludes that strategic investments in transit, demand management, and freight could yield net economic benefits of over $400 billion over 30 years. CCAP calculates associated transportation GHG savings of 18 $MMTCO_2$.

Rails-to-Trails calculates that Portland, Oregon's investment in bicycle infrastructure will cut 0.7 $MMTCO_2$ with net economic *benefits* of more than $1,000 per ton CO_2. The Center for Transit Oriented Development reports that $73 million invested in the Portland Streetcar helped attract $2.3 billion in private investment within two blocks of the line.

A Brookings Institution study shows that shifting to per-mile car insurance pricing could cut VMT and related GHGs by 8% yielding insurance cost savings for two thirds of households, averaging $270/vehicle/year and annual societal savings of $50-60 billion.

The Sacramento region's *Blueprint Transportation and Land Use Study* used cutting-edge planning software in an extensive public outreach process to explore alternative growth scenarios through 2050. The Sacramento Area Council of Governments (SACOG) plan compared two scenarios for the year 2050. The first scenario projected past trends of growth and development, an outward growth pattern with an imbalance of jobs and housing among subareas. The alternative assumed regional growth following the Preferred Blueprint Scenario, with more housing choice, infill and better internal jobs-housing balance, while population growth was similar to the Base Scenario. The adopted scenario features infill development and transportation investments that will produce 14% less CO_2 than the business-as-usual forecast, a cumulative savings of 7.2 $MMTCO_2$.

SACOG calculated the price tag of the Base Case Scenario to be $47.4 billion through 2050 versus $38 billion for the Preferred Blueprint Scenario—a savings of $9.4 billion dollars. This process cost roughly $4 million in expenditures in Blueprint planning process—a hefty return on investment.

One third of the savings are from transportation infrastructure, another third from water infrastructure, and the last third from flood control and dry utilities. SACOG calculates that transit operating costs would increase by about $120 million per year under the Preferred Blueprint Scenario and annual consumer fuel expenditures would be $380 million lower. CCAP calculates the net present value of the increased transit costs, fuel cost savings and avoided infrastructure costs to be $1.4 billion. Dividing by the cumulative 7.2 $MMTCO_2$ savings yields a net *benefit* of $198 per ton CO_2 saved. SACOG also assessed the costs associated with mitigation land purchases, and calculated additional savings of $8.3 billion through 2050. Including land purchases yields a net benefit of $341 per ton CO_2 saved.

5.5.2. Sweeney and Weyant (2008)

Sweeney and Weyant (2008) performed a variety of analyses on different potential measures to reduce greenhouse gas emissions in California. Many of their analyses draw estimates directly

22. Johnston, R. "Review of U.S. and European Regional Modeling Studies of Policies Intended to Reduce Motorized Travel, Fuel Use, and Emissions." Victoria Transport Policy Institute. August 2006, http://www.vtpi.org/johnston.pdf

23. U.S. Federal Highway Administration, "Transportation and Global Climate Change: A Review and Analysis of the Literature." Strategies to Reduce Greenhouse Gas Emissions from Transportation Source 5: 1998. http://www.fhwa.dot.gov/environment/glob_c5.pdf.

from the available literature about the cost and quantity reductions. Others use the literature as a starting point for their own analysis. Figure 10 presents their 2020 MAC curve, which represents their estimate of the potential greenhouse gas reductions available to California in the next 12 years for any given cost.

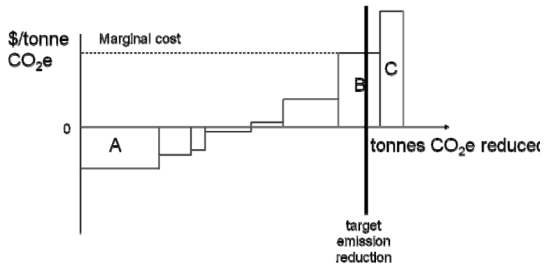
Given the wide variety of costs of the various measures, it is useful to introduce the concept of a *marginal abatement cost (MAC) curve* for greenhouse gas emissions reductions (sometimes described as a "supply curve for emissions reductions"). Several recent prominent studies have constructed such curves for national and international greenhouse gas mitigation, most notably the McKinsey Report.

Imagine ordering all feasible greenhouse gas emission mitigation measures from lowest individual cost to the highest individual cost. This ordering includes all feasible measures, whether currently being implemented or not. Each measure is associated with an amount of reductions and a (social) cost per tonne to achieve those reductions. This cost per tonne is the *average* cost per tonne of achieving the given amount of reductions for the individual measure. Within each individual measure, some of the reductions may be less costly than others, but it may be too difficult to differentiate among the various reductions that together are part of a measure. Thus we focus our effort on elucidating the differences in average cost *across* measures and the amount of reductions each measure may achieve.

Any collection of feasible measures will imply a total amount of reductions (calculated by adding up the reductions from the individual measures) in addition to the costs/tonne of the individual measures. If the feasible measures are ordered from the lowest individual cost/tonne to the highest individual cost/tonne, then the ordering would show, for any total amount of reductions, the cost of the most expensive feasible measure needed to achieve the total reduction.

The *Marginal Abatement Cost curve*, or the *MAC curve*, is this representation of the various total feasible amounts of reductions versus the cost of the most expensive measure needed to accomplish that level of total reductions, with costs ordered from the lowestw to the highest individual costs. Figure 10 shows an example of a MAC curve for emissions reductions. To interpret the MAC curve, consider the lowest cost measure, measure A. The width of the rectangle A represents the emissions reductions from this measure, and the net social cost of achieving these emissions reductions is given by the y-axis value attributed to A.

Figure 10. Theoretical Marginal Abatement Cost Curve (MACC)



Once a MAC curve is constructed, one can find the total number of measures needed to reach the target level of emissions reduction by drawing a line designating this target (shown above). That total reduction will then imply the cost of the most expensive feasible measure necessary to achieve that reduction in the ordered list of measures. In the example in Figure 10, the most expensive measure needed to meet the limit is measure B. In principle, all measures on the MAC curve having that cost or lower will be cost-effective, while those measures having a higher cost will not be cost-effective.

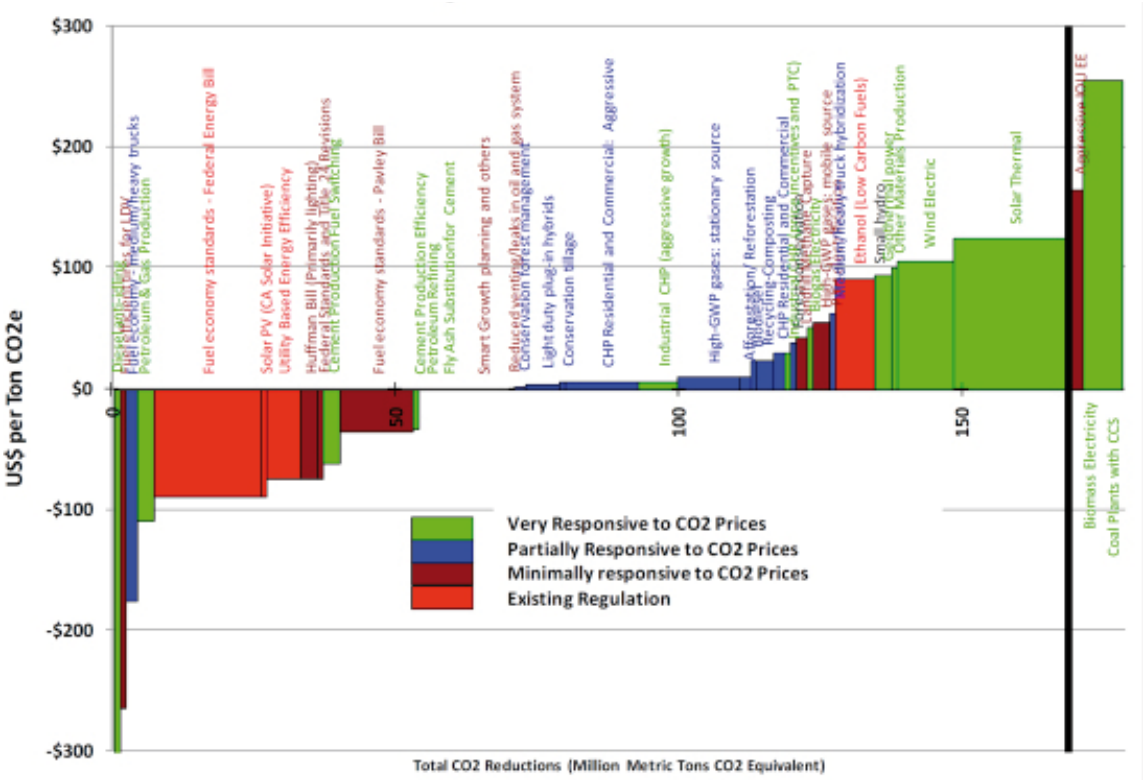
In addition, for any given target emissions reductions, we can use the MAC curve to estimate how expensive it would be to tighten the target further and reduce one more unit of emissions. The cost necessary to reduce one more unit of emissions is known as the *marginal cost* of emissions reductions. The marginal cost associated with the target emission reduction represents the cost of the most expensive measure in the list of measures needed to meet the target reductions.

The MAC curve provides an outline for the measures that CARB should examine most closely in implementing AB 32. Those measures to the left of the target emissions reduction are those measures that are most likely to be cost-effective given the target emissions reduction

Sweeney and Weyant (2008) are adopting the CARB 2020 business-as-usual emissions of 596 $MMTCO_2E$, with a target emissions reduction given by the thick black line at an emissions reduction of 169 $MMTCO_2E$. This corresponds to CARB's assessment of the necessary emissions reductions in 2020 to achieve the AB 32 target of 427 $MMTCO_2E$.

The width of each block in the curve represents their best estimate of emissions reductions, and the height of each block represents the average cost of achieving those emissions reductions. Within each measure some of the emissions reductions may be less costly than the average cost per tonne for the entire measure, but by the nature of the measure these less costly measures cannot be easily isolated.

Figure 11. CO_2 Marginal Abatement Cost Curve



The color scheme is designed to differentiate those measures that would likely be responsive to a market-based policy that appropriately priced carbon (e.g., a cap-and-trade or carbon tax system), from those measures that are less likely to respond to a market-based policy. The latter class of measures includes those that are not price responsive as a result of market failures other than the greenhouse gas externalities (e.g., informational market failures). For these measures, even if carbon dioxide is correctly priced, the measure still might not occur – implying that other policies are likely to be necessary to implement these measures. Green represents those measures that are likely to respond fully to carbon prices, dark red represents measures that are only minimally responsive to carbon prices, blue represents measures that are partially responsive. Sweeney and Weyant (2008) also color-code existing policies separately, since these measures will not require any additional action by CARB beyond continued implementation. Bright red represents such measures.

There are a few important conclusions to take from this MAC curve.

One primary conclusion is that if we read from left to right along the horizontal axis, we can see the measures that have the lowest cost per tonne CO_2E reduced and are thus most likely in this estimation to be cost-effective. The curve reveals that there are likely to be many negative cost measures, but to meet the AB 32 target emissions reduction, CARB will have to consider implementing many measures that have positive costs.

The curve also reveals that the total cost to society before accounting for the benefits from reducing greenhouse gases may well be positive, for the positive area under the curve to the left of the target emissions reduction appears to be slightly larger than the negative area under the curve at the far left. But once we account for the benefits of reducing greenhouse gases, even with this small positive cost, the overall policy is worthwhile. However, the analysis suggests that the emissions reductions are likely to come with some cost; they are not likely to be costless in aggregate.

Another conclusion is that the marginal cost of implementing AB 32 may exceed $100 per tonne CO_2E. The marginal cost is the additional cost of one more unit of CO_2E reductions. We can see this on the curve by noting the height of the block through which the target emissions passes. This marginal cost would correspond to the market price of carbon dioxide under a market based system if all of the measures to the left of the target emissions reduction are implemented. It is important to distinguish the marginal cost per tonne of CO_2E from the *average cost* of emissions reductions, which is the total cost of emissions

reductions divided by the total reductions. Since the total cost appears to be positive but small, the average cost would be just slightly positive, perhaps around $10 per tonne of CO_2E.

A final conclusion from the MAC curve is that existing regulation captures several of the largest measures, and that the remaining measures are evenly distributed between measures that are more likely to be responsive to a price on CO_2 and measures that are less likely to be responsive. It also appears that several of the measures that are less likely to be responsive are lower-cost measures on the curve, suggesting that CARB should examine additional policy interventions to achieve these low-cost measures.

Examining the curve, two of the largest negative-cost measures are the 2007 Federal Energy Bill fuel economy standards and AB 1493 (Pavley) vehicle greenhouse gas standards. However, there is an important interaction between the California restrictions and the newly configured Federal fuel economy (CAFE) standards. The Federal fuel economy standards require automakers meet a national fleet-wide average fuel economy. It is unlikely that the automakers will exceed the federal standards. Thus, unless either enough other states also adopt the standards or the Federal government adopts the standards, there will be a very high level of leakage, if not 100% leakage. Any emissions reductions from the policy in California are likely to be offset by additional emissions in other states, with the automakers just meeting on average the federal CAFE standards.

6. BARRIERS

Downs (1999) and Levine (2006) challenge the notion that the low-density, automobile dependent pattern that dominates U.S. metropolitan areas simply reflects consumer preferences operating through the free market. Instead, they argue that land development is one of the most regulated sectors of the U.S. economy. Rather than operating freely, land use markets have limited the supply of alternative higher-density, mixed-use developments (Levine and Inam 2004; Levine 2006).

A survey of developers conducted in conjunction with the Urban Land Institute in 2001 provides evidence of this market bias (Levine and Inam 2004). Developers reported considerable market interest in compact developments but an inadequate supply. The two most important reasons cited were government regulations hostile to such developments and neighbourhood opposition (Levine and Inam 2004). For those developers that actually proposed more compact developments and were granted variances, more than 80% of the modifications involved reduced density, higher than any other category and signalling strong resistance to this design feature. If regulations could be relaxed, developers identified close-in suburbs rather than the metropolitan fringe as those areas with the most potential for more compact development.

In many respects, SB 375 represents a bold new step for California. It aims to achieve a challenging policy objective, namely to reorient development planning to help reduce greenhouse gas emissions substantially. This is like turning a huge ship around, because many aspects of the current planning and development process facilitate low-density, car-dependent development instead.

Indeed, in its methods for accomplishing this goal, SB 375 faces many barriers that this section will cautiously identify and analyze. This section will therefore address successively barriers related to real-estate market dynamics, barriers related to the existing institutional framework, barriers related to local policy tradition, barriers related to higher infill cost for local authorities and developers and builders, barriers related to policy framework and coordination between various state urban policies, barriers related to funding capacities and finally barriers related to technical capacities.

6.1. Barriers related to real-estate market dynamics

6.1.1. Maturity and durability of the urban development pattern: the Housing Stock

The durability of the housing stock makes it difficult to change development patterns, at least in the short and medium terms. In contrast to passenger vehicles, whose median age in 2007 was 9.2 years, housing typically lasts 50 years or longer (Brown et al. 2005). The longevity of existing housing is often coupled with the negative receptivity of existing homeowners to change, particularly to increasing density levels in their communities, which is frequently perceived as threatening the value of their homes. More generally, most metropolitan areas have mature land use patterns and transportation systems that make change difficult, except at the margin. The maturity and durability of metropolitan development patterns help explain why policies to change land use have incremental effects that only cumulate over a long time frame.

6.1.2. Perception of local communities

As they evolved, zoning regulations often operated to reinforce economic and racial separation. Exclusionary zoning in wealthier communities restricted multifamily housing, for example, by

establishing minimum lot sizes or housing square footage, which had the effect of keeping housing prices high and thus excluding lower-income families (NRC 1999; Pendall et al. 2006). Once in place, such zoning regulations tended to be reinforcing; homeowners viewed efforts to incorporate more affordable multifamily housing as a threat to their property values (Fischel 1999 in NRC 1999). It is difficult to overcome such exclusionary zoning by persuading local governments to permit higher-density development. As Downs (2004) points out, most local governments have strong incentives to support the land use preferences of their own citizens and ignore the needs of the metropolitan area as a whole. Many homeowners appear to prefer single-family, detached housing and the perceived amenities of suburban living (e.g., access to open space and recreation, less congestion) and view zoning changes, particularly allowing increased density, as threats to the value of their homes and the ambience of their neighbourhoods.

6.2. Institutional framework

SB 375 directs regional and local transportation and land use planning to meet a challenging new performance target, namely to reduce greenhouse gas emissions. Existing regional planning agencies, Metropolitan Planning Organizations (MPOs) specifically, are directed to take responsibility for implementing SB 375. The law requires that regions (through regional planning organizations, in cooperation with local governments) develop "Sustainable Communities Strategies" to achieve more efficient land use and transportation by aligning some planning processes that traditionally had been disconnected. However, SB 375 does not require that local governments comply with the Sustainable Communities Strategies nor does it redirect or create new funding sources to support sustainable planning practices or projects.

Relying on MPOs for planning coordination makes sense because these agencies have been recent innovators in strategic growth planning in California. In particular, SB 375 explicitly recognizes the regional "blueprint" planning innovation, developed by California MPOs during the past decade, to produce collaborative regional/local plans that achieve preferred scenarios for future regional development. SB 375 retains the governance framework that underlies the blueprint model, so it makes use of the same capacity for innovation and consensus-building. However, the blueprint governance model also has some inherent weaknesses when it comes to producing plans with a strong regional focus, weaknesses that can be expected to persist under SB 375.

As it stands, the authority of MPOs is limited by a) their governance structure, and b) state funding allocation formulas.

6.2.1. Governance structure

COG/MPOs act as an interface between local governments and state and federal programs and have no independent authority as such. COG/MPOS are governed by representatives of local governments and sometimes other entities such as transit districts, and are not directly accountable to voters. Therefore, it is worth noting that MPO decision-makers are made up of local elected officials. Accordingly, MPOs are not likely to support measures that limit the discretion of cities and counties, particularly in those MPOs where every city and county in the region has a seat on the MPO board.[24]

This structure maintains broad local government "buy-in" for regional decision-making; COG/MPOs must devise policies that gain broad support from member local governments. To implement SB 375, COG/MPOs must convince member local governments that adopting local policies with regional benefits is in their self-interest. In relation to land use, COG/MPOs have no actual authority; they can only influence local policy by providing incentives from their own resources, or through peer pressure or technical assistance.

The voluntary, collaborative COG/MPO governance structure has long made it difficult to develop plans and programs with a strong regional systems focus. The governing structure can foster a "lowest common denominator" approach to policymaking, steering away from controversial policies that could create winners and losers among local government members. COG/MPOs face a structural incentive to allocate benefits or mandates equally across jurisdictions.

6.2.2. State funding allocation formulas.

The MPO role is further constrained by state funding formulas that tend to reinforce the county role in transportation programming. Indeed, the state funding formulas tends to reinforce MPO's status as regional "umbrella" organizations, rather than enabling MPOs to adopt concerted regional policies based on regionally defined performance goals. As noted earlier, MPOs' main source of authority is their control over allocation of Regional Transportation Improvement Program

24. Only two regions, Southern California Association of Governments (SCAG) and Metropolitan Transportation Commission (MTC), do not fit that model.

(RTIP) funds, the state's main program for transportation capital expansion in urban regions. However, according to a long-established formula, funds for the RTIP are geographically divided by a "north-south split" in which 60% of STIP funds are allocated to the 13 southern counties and the remainder to the 45 northern counties. These funds are further divided into county shares based on a statutory formula allocating 75% of funds based on population, and 25% based on highway lane-miles. Note that the formula for allocating county shares tends to reward those counties that build more highways and roads, and it does not direct spending to those parts of a region that might be able to produce the greatest regional benefit from improved transit or TOD.

The county share formula can work against MPOs that seek to target funds for programs and projects that are regional in scope and cross county lines, because county-level priorities do not always match regional-scale priorities.

6.2.3. From regional plan to local implementation

6.2.3.1. Consistency between Regional RTP/SCS and Local General Plan

Senate Bill 375 gives MPOs a clear mandate to coordinate regional transportation planning toward reducing GHG emissions. However, federal regulations require that RTPs, and hence SCSs, must be consistent with local general plans (Code of Federal Regulations §450.322). Therefore, MPOs that propose ambitious SCSs that focus growth in mixed-use centers that are well-served by transit will may need to demonstrate that their land use scenarios are consistent with existing plans. In the past CalTrans has required that MPOs provide additional information in support of their land use forecasts if these projections appear to deviate from local general plans. These consistency requirements may affect MPOs' ability to create an SCS that meets GHG reduction targets, since the strategy must reduce emissions below base-case levels without deviating from the local plans that inform the current development pattern and hence the base-case emissions levels.

Today there is no consensus among experts and MPO staff about whether consistency requirements would prevent MPOs from creating a viable SCS. Some nuance the role of local general plans in informing RTP land use projections: Though the SCS will have to be consistent with local general plans, it doesn't necessarily follow that the SCS has to assume that these plans will all be fully built out. According to this view, if local general plans can cumulatively accommodate more growth than an MPO projects for the region, the MPO has the freedom to assume where that growth will go and plan accordingly. An SCS could reduce emissions by forecasting the maximum permissible level of development in the most accessible locations in which general plans allow more intensive use, and targeting transportation improvements toward these areas. Moreover, RTPs typically extend 15 years further into the future than general plans, giving MPOs additional "wiggle room" to make assumptions about the type of growth that will occur beyond the horizon of local plans.

Many regional agencies have followed a similar approach in creating their blueprint plans and other regional smart growth strategies. Instead of calling for higher densities in existing single-family areas, most blueprints have created target development areas in multi-family or commercial neighborhoods. This approach may be necessary to achieve local buy-in on a regional plan, but it limits the potential of blueprint plans to reduce GHG emissions. This suggests that consistency requirements may pose an obstacle to MPOs in creating SCSs, either by limiting the assumptions that regional planners make about where growth will go or by posing political obstacles to MPOs that do create more ambitious GHG reduction plans.

Even if MPOs do create an SCS or APS that simultaneously meet consistency requirements and GHG reduction goals, local governments are responsible for implementing the SCS through updates to their general plans, and ultimately to their zoning and building codes. However, SB 375 does not provide guidance about how to translate long-term regional plans into more immediate local plans. Furthermore, updating general plans is a time-consuming and expensive process. A 1991 survey found an average update cost of $208,000 (Olshansky 1996), and Rose (2010) estimates today's costs falling between $500,000 and $1,000,000 depending upon the size of the city and the comprehensiveness of the update. SB 375 does not provide any funding to cities for plan updates, and though the Strategic Growth Council, which was established in 2009 by Senate Bill 732, may allocate some of its $90 million in funding toward local general plan updates (California Governor's Office of Planning and Research 2008), this would only fund general plan updates in a fraction of California's 478 cities. Further updates to building and zoning codes may also be necessary in order to provide clarity on how general plans should be built out. Zoning and building codes are often more complex and dated than general plans, and updating them may

be even more expensive. Local governments have the power to both determine what is possible in an SCS via consistency requirements and to implement an SCS by updating general plans and codes, but SB 375 does not provide any guidance on how they should do so.

6.2.3.2. Lessons from MPO blueprint: incentive-based programs in order to implement long-term regional plans

The need for local government cooperation combined with the lack of resources for local planning has led California's 4 largest MPOs to create incentive-based programs in order to implement their long-term plans. MTC, SANDAG, and SACOG offer capital grants to local governments for projects that improve pedestrian, bicycle, and transit facilities along local streets. SCAG and SANDAG also have technical assistance programs, wherein staff train local planners on analysis and outreach techniques to support smart growth, such as adjusting trip generation estimates and parking requirements for mixed-use or transit-oriented developments and creating computer graphics of proposed developments. Since SB 375 neither changes regional governance structures nor allocates more funding to local planning, these programs may set an example for other MPOs looking to fill the gap that exists between regional plans and local implementation under SB 375.

These implementation programs currently constitute less than 1.5% of total transportation expenditures in each of California's largest four metropolitan areas. Rose (2010) mentions several constraints on their funding sources that may prevent MPOs from expanding these grant programs in order to meet SB 375 targets. MPOs most commonly use either three federal sources to fund grants: Congestion Management and Air Quality (CMAQ) funds, the Regional Surface Transportation Program (RSTP), and the Transportation Enhancement Act (TEA). Each source carries its own set of restrictions. For example, CMAQ funds can only be used for transit capital projects and street-side improvements to the pedestrian, bike, and transit user environment, but these funds are difficult to apply toward transit. RSTP funds are more flexible, but are highly competitive since local governments also use them for local street maintenance. TEA funds are the most flexible source, but they constitute less that 1% of the total revenues available to MPOs. State funding sources for smart growth programs include Transportation Development Act revenues and CalTrans Regional Blueprint Grants, but MPOs only control a small portion of the former, while the latter are not a stable long-term funding source.

Even if MPOs are able to dedicate substantial amounts of transportation funds toward coordinated implementation of blueprint plans and smart growth policies, these projects often involve many costs unrelated to transportation planning. Building at higher densities or with a wider mix of uses often carries high marginal costs to increase the capacity of sewage and water infrastructure, conduct the fire and seismic safety upgrades necessary for taller buildings, and providing the additional open space and services necessary to support a larger population. Often, cities can not levy developer fees sufficient to upgrade the whole sewer system, and voters would not approve an assessment to upgrade a system that currently works. In order for MPOs to fund sewer upgrades or other non-transportation-related improvements, they have to find a local government with a revenue stream that can be used for such purposes and then arrange to trade transportation funding for these revenues. In large regions with many overlapping municipal governments, county governments, and utility districts, MPOs may have to negotiate several complex agreements in order to implement a regional smart growth grant program that provides for the wide array of financial needs of smart growth developments.

6.3. Barriers related to local policy tradition

6.3.1. Local Zoning Regulations

Local zoning regulations are a significant impediment to more compact, mixed-use development. Land use planning and regulations are controlled by local governments. The authority to create zoning and subdivision controls and building regulations, which have the force of law, is a powerful tool in establishing the design requirements and physical context of a community's development. The two most important impediments to more compact development from current zoning regulations are *a*) development densities and *b*) mixing of land uses. Zoning was introduced by urban reformers in the United States in the early twentieth century to help alleviate the impacts of urban overcrowding on disease and illness—hence the focus on limiting development densities and segregating incompatible land uses, such as residential and high-polluting industrial uses (TRB 2005). The product of lower-density development and separation of land uses, however, was often long distances between destinations, creating dependence on the automobile.

6.3.2. Engineering Requirements, Street Design, and Parking

Municipal street designs and parking regulations, which often tend to emphasize the needs of motorized travel at the expense of other modes, have also had an important impact on the design of communities (Meyer and Dumbaugh 2004). Municipal street design requirements favour minimum street widths to provide accessibility for fire trucks, long straight sight lines, and street layouts that discourage through traffic.[25] The result has been to reduce the desirability and safety of nonmotorized forms of transport, such as walking and bicycling, and limit the connectivity of streets, tending to isolate residential from other land uses.

Most community zoning codes for new development require that a minimum number of parking spaces be provided per housing unit or per 1,000 square feet, reflecting the maximum demand for parking (Meyer and Dumbaugh 2004). Parking requirements, which Shoup calls a "blind spot" and "unstudied link between transportation and land use," are calculated on the basis of meeting peak demand for free parking, not on how many spaces drivers will demand at a price that covers the cost of the spaces. In most cases, this number is greater than what is needed to handle normal demand and results in an oversupply of parking, particularly in suburban areas (Shoup 2005). Minimum parking requirements encourage driving to most destinations and take up space that could be used for neighborhood amenities, such as parks and green spaces (TRB 2005).

The Institute of Transportation Engineers' (ITE) trip generation rates are the standard by which local traffic impacts of new development are typically estimated and parking requirements and development impact fees are set. Generally, the data used to set trip rates are drawn from suburban areas with free and plentiful parking, low-density land uses, and minimal transit service (Cervero and Arrington 2008; Smith 2009). A recent study of vehicle trip generation rates in 17 transit-oriented developments (TODs) in five U.S. metropolitan areas found that vehicle trip rates were significantly overstated (Arrington and Cervero 2008). TOD housing projects averaged 44% fewer trips than estimated by the ITE manual. The researchers recommend that both traffic impact fees and parking requirements be reevaluated, potentially reducing the development costs of many TODs (Cervero and Arrington 2008).

6.4. Barriers related to higher infill development costs for local government and builders

6.4.1. Financial Barriers in developing infill

A central goal of SB 375 is to reduce GHGs from VMT by linking transportation and land use practices. On the ground, that often translates into a need for more compact "infill" development accessible to transit. Infill development may be an environmentally friendly, efficient land use strategy, but cost barriers can be substantial for local governments and developers. The success of SB 375 depends on the ability of local governments to encourage compact, mixed-use development. However, localities have few resources to directly support infill development, especially infrastructure costs.

The financial barriers to implementing an effective infill strategy range from the cost of updating century-old sewer lines to finding adequate funds to build and maintain affordable housing units in gentrifying neighbourhoods. Building infill often imposes substantial costs on local governments and developers, including costs to update aging or overtaxed infrastructure and costs for assembling complex land parcels, all in neighbourhoods where current residents may raise substantial concerns about the impact of new development. Add to that the fiscal constraints imposed on local governments by voter initiatives such as Proposition 13 (cf. 6.5.3), and it is no wonder that many local governments find it difficult to accommodate much infill.

By contrast, development in "greenfields" at the edge of urban regions is often more cost-effective for developers and local governments, where there are fewer restrictions on developments, fewer neighbours to object to the development, fewer logistical concerns during construction, and the infrastructure is more modern and it can be planned and funded more easily. The cost of new infrastructure to support development in greenfields can often be imposed on the development itself, in the form of developer fees or exactions, some portion of which then get translated into higher housing costs for new residents. By contrast, the cost for replacing an aging sewer line down the main street of a built-up city is less easy to impose on new development. Furthermore, current residents

25. Early municipal street designs incorporated in guidelines issued by the U.S. Federal Housing Administration in 1935 recommended that residential streets be designed to "discourage through traffic, have a minimum paved width of 24 feet, use cul-de-sacs as much as possible, and avoid excessive planting in the front yards to have a 'more pleasing and unified effect along the street'" (FHA 1935 in TRB 2005). Wide streets were believed necessary to accommodate the worst-case emergency scenario two high-rise ladder trucks jockeying for position on a dead-end street (Duany et al. 2000 in Meyer and Dumbaugh 2004).

may balk at the idea of paying new taxes to bring new development into the neighborhood.

Another infill-related cost is for building and maintaining affordable housing units. Transit oriented development (TOD) is now gaining market appeal, and SB 375 will help increase demand for TOD through strategies such as transit expansion. Cities run the risk of allowing gentrification in neighborhoods near transit to price out lower-income families. For this reason, measures are needed to help ensure that compact, transit-oriented neighborhoods remain affordable to a mix of families.

While many of these costs of infill development are experienced locally, many benefits of infill development are experienced primarily at the state and regional scale, in the form of lower costs for investment in large-scale infrastructure like highways and transit systems, and lower environmental costs such as for air pollution, greenhouse gas emissions, and loss of open space. This imbalance between local costs and regional benefits makes it imperative for the state and regions to support localities that take on infill development.

6.4.2. Emerging supports from MPO and California State

The state's four largest MPOs have developed innovative programs to reward localities that build infill development – programs which provide a model for the state government and other MPOs to emulate. In 1998, the MTC launched its Transportation for Livable Communities (TLC) Capital and Planning Program. This program supports community-based transportation projects that connect transportation investments with supportive land uses. In 2001, MTC also established the innovative Housing Incentive Program (HIP) to reward communities that promote high density housing near transit with transportation-related capital funding. Other MPOs have followed suit with similar programs. These MPO programs have seeded many valuable projects, but they remain constrained because MPO funding is generally restricted for transportation-related purposes and current transportation needs are substantial. In 2006, California took a major step toward increasing its support for infill development and related infrastructure when voters passed Proposition 1C, a $2.85 billion bond for housing-related programs. Prop 1C funded the Infill Infrastructure Grant Program at $850 million, to support the construction and rehabilitation of infrastructure for higher-density, affordable and mixed-income housing in infill areas.[26] Prop 1C also funded the Transit-Oriented Development Program, at $300 million, to provide low interest "gap" financing for rental housing development projects, as well as mortgage assistance, for affordable housing within ¼ mile radius of transit stations.[27] Both programs are administered by the state's Department of Housing and Community Development (HCD).

Unfortunately, the success of HCD's Proposition 1C programs could potentially be short lived if a permanent funding source is not secured. A permanent source of funding for programs that support infill development, especially for infrastructure and affordable housing, should be a priority for the state.

6.5. Policy framework: coordination with State urban policies

SB 375 depends fundamentally on local government participation in developing plans and policies to support state and regional objectives, and the state government sets the framework of fiscal and regulatory policies in which local governments make those choices. If state policies work to support SB 375, then its collaborative governance model can work as a means for coordinating state and local priorities and preferences. However, if state programs and policies do not provide sufficient support or counteract SB 375 objectives, then there is little reason to expect local governments to develop ambitious SCSs through the MPO/COG framework.

Furthermore, the state government has many more resources than MPOs to incentivize land use choices that support SB 375, whereas MPOs are limited to using the transportation dollars over

26. Grants from the Infill Infrastructure Grant (IIG) Program have ranged from $250,000 to $20 million. The following criteria are used for selection: project readiness, housing affordability, density, proximity and access to transit, parks, employment centers, and consistency with a regional blueprint or similar regional growth plan. The criteria also specify parking maximums and the use of funds for roads, transit linkage facilities, and pedestrian and bike facilities. By the end of 2008, the IIG Program had awarded $340 million for 9,893 newly constructed or rehabilitated rental units (HCD Cumulative Proposition 1C Bond Awards through December 31, 2008).

27. By the end of 2008, the TOD program had awarded $145 million for 3,629 new and 297 rehabbed units (ibid). Developments must have a minimum of 50 units and criteria for approval include estimates of how much the proposed project will increase transit ridership and minimize automobile trips. Other criteria include: the extent to which the development serves moderate and below moderate income levels, if it includes transit-supportive land use (services in the area that would encourage walking i.e. bank, church, community service center), and if it promotes economic efficient parking policies.

which they have authority. If MPOs direct those funds toward rewarding local jurisdictions for land uses supporting SB 375, they will have fewer funds available for other transportation related projects and maintenance of existing infrastructure.

6.5.1. Proposition 1C

Some state policies and programs do currently work to promote SB 375 objectives. One example is a set of new programs funded through Proposition 1C, a $2.85 billion state housing bond passed by voters in 2006. The $300 million Transit-Oriented Development Program, funded through Proposition 1C, provides low interest "gap" financing for rental housing development projects, as well as mortgage assistance, for affordable housing within ¼ mile radius of transit stations. The $850 million Infill Infrastructure Grant Program, also funded through Prop 1C, supports the construction and rehabilitation of infrastructure for higher-density affordable and mixed-income housing development in infill areas. Both programs are administered by the state's Department of Housing and Community Development. Prop 1C programs represent the first time that California has put substantial resources behind a policy to support infill development. In fact, the premise for the programs was devised by the MPOs themselves, some of which have been providing such incentive grants to localities since the early 2000s. However, it is difficult for MPOs to direct substantial amounts of transportation funding toward land use-related programs and projects.

6.5.2. Proposition 1B and State budget cuts

Many other state programs send a different message than Prop 1C: they do not work to support SB 375 objectives. An example is Proposition 1B, a $20 billion transportation bond passed by voters along with Proposition 1C. Proposition 1B directs only $4 billion, or 20% of its total funds, to transit expansion. The legislature subsequently exempted all projects funded through Proposition 1B from conformity with SB 375. More recently, substantial state budget cuts to transit have further undermined SB 375 objectives. Approximately $1 billion of transportation funding was diverted in the 2009-10 state budget to relieve the deficit in the state's General Fund (MTC, 2009). Given that SB 375 relies on transportation investment as leverage for achieving success, these state actions send mixed signals to local governments about how strongly the state endorses the SB 375 process.

6.5.3. Proposition 13 and proposition 218

Many state fiscal policies work against SB 375 objectives. In particular, fiscal policies for local governments discourage infill and housing development. Since Proposition 13 was passed in 1978, local governments' ability to raise property tax revenue – the traditional mainstay of local government finance – has been limited. In addition to cutting property taxes substantially, Prop 13 also mandated a two-thirds vote in both state legislative houses to approve state tax increases and a two-thirds local popular vote for local special taxes (which were not defined). In 1996, voters passed Proposition 218, which established that majority voter approval is required to impose or increase any local tax for general purposes, and two-thirds voter approval is required for taxes designated for special purposes.

6.5.4. "User pays" principle and fiscalization of land uses

Local governments have responded to these fiscal limitations by maximizing revenue sources over which they retain control.[28] Community-wide taxes and services, traditionally derived mainly through property taxes, have declined as a share of city finance.[29] The cost of city services has become increasingly "internalized," based on a "user pays" principle. Such financing may be efficient economically if services can be treated independently. However, as community-wide taxing power declines, community-wide needs such as shared infrastructure become harder to address. This challenge directly affects opportunities for supporting infill development, which often requires rehabilitation of old or heavily burdened public facilities.

Fiscal constraint affects local government choices about land use and development in other ways as well. Fiscally constrained local governments often make land use choices based on the amount of revenue they can obtain. As land use choices became increasingly "fiscalized" (scrutinized with an eye to budget impacts), one consequence is that city governments strongly favour retail development over housing and industry—land uses generally less able to "pay their way" in terms of the cost of services (Lewis and Barbour, 1999; Coleman, 2006). The stress to obtain revenue has led

28. In particular, cities became more aggressive about imposing user charges and fees. Revenue from charges and fees increased by 162% in California cities from 1972 to 2002, faster than for California counties and cities in the rest of the nation (Barbour, 2007). Per capita revenue from benefit assessments in California nearly doubled from 1987 to 2002, reaching a level more than twice as high as in the rest of the U.S.

29. Before Prop 13, most community-wide discretionary revenue came from two sources—property and sales taxes. These sources declined from 39% of city revenue in 1972 to 29% in 2002 (Barbour, 2007).

to intense "fiscalization of land use," leading many localities to favour "big box" and other commercial developments which bring in significant sales tax. Cities compete to attract retail development and associated sales tax revenue, which in California is allocated to the jurisdiction in which the sale occurred.

Another land use impact has been to transfer the costs of infrastructure for new development onto the development itself. Local officials can impose fees and exactions on developers and create community facilities districts. These techniques facilitate development in "greenfields" more than "infill" areas, because fees imposed on new development do not require voter approval, and because they are easier to coordinate than in already built-up areas. Moreover, infrastructure needs in developed areas are often more expensive to address than in Greenfield areas.

6.5.5. State transportation funding unpredictability

Compounding the problem of fiscal constraint for localities has been fiscal unpredictability resulting from revenue shifts by the state government undertaken to help address ongoing budget deficits. The state government has diverted a considerable amount of funding to help balance the state's budget. According to the California Legislative Analyst's Office (LAO) – the state's nonpartisan budget "watchdog" agency – the ongoing diversion of transportation funds since 2001– 02 has resulted in instability and unpredictability of funding, which has produced project delays, planning complications, and inefficiencies at Caltrans (LAO, 2009). In particular, the LAO notes that erratic transit funding over recent years has created instability in ongoing programs and for specific projects (LAO, 2009). For these reasons, the LAO advocates that the legislature provide more stable and predictable funding for the state's transit programs. This year's state budget agreement, for example, allows for diversion of up to $2.05 billion in redevelopment agency property tax revenues in 2009-10 and 2010-11, and it borrows another $1.94 billion in local government funds that must be repaid by 2013 (California Budget Project, 2009). Recent funding cuts to cities, counties, transit agencies, and redevelopment districts exacerbate more long-standing fiscal limitations faced by these agencies and local governments.

6.5.6. Weakness of CEQA incentives under SB 375

CEQA relief provided under SB 375 is optional, and it is not clear that the incentives are adequate to induce substantially more infill or Transit Oriented Development (TOD) development. In particular, the exemptions provided for specific Transit Priority Projects (TPP) may be insufficient to induce much new infill. The definition of a TPP under SB 375 is narrow; a long list of stipulations must be met before a project can be designated as a TPP, including that it contain not more than 200 residential units, that it can be served by existing utilities, that buildings are 15% more energy efficient than required under state law and use 25% less water than the regional average, and that it provides either 5 acres or more of open space per 1,000 residents or 20% housing for moderate income residents, 10% housing for low income residents, or 5% for very low income (or in-lieu fees sufficient to develop the equivalent number of units).

It may be the case that few development projects would meet the TPP standard. Either way, local agencies and developers must choose to take up the exemption. As noted earlier, research indicates that fewer than 15% of developers took up prior exemptions for infill projects provided under state law (Elkind and Stone, 2006).

SB 375 does address one obstacle that may have prevented take-up in the past – legal exposure (Collin, 1993). By applying the "substantial evidence" standard rather than the "fair argument" standard for initiating review of subsequent project effects, SB 375 may limit legal exposure for TPPs. However, SB 375 does nothing to address some other primary obstacles that have prevented developers from taking up the prior exemptions, including reluctance to rouse NIMBY sentiment, and a resulting preference on the part of developers for using infill sites already cleared by CEQA review.

The tiering provisions under SB 375 may prove to be more useful; the provisions could help reorient CEQA to support regional, rather than just local, priorities and plans. A good example is how traffic congestion impacts are assessed and mitigated. Traditionally, if a specific local development project was determined to be congestion-inducing, mitigation measures might have included lowering the project's density. Within the SB 375 framework, the localized congestion impacts instead can be assessed within a wider lens (through the SCS), and a lower density project alternative need not be included in the project-level review.

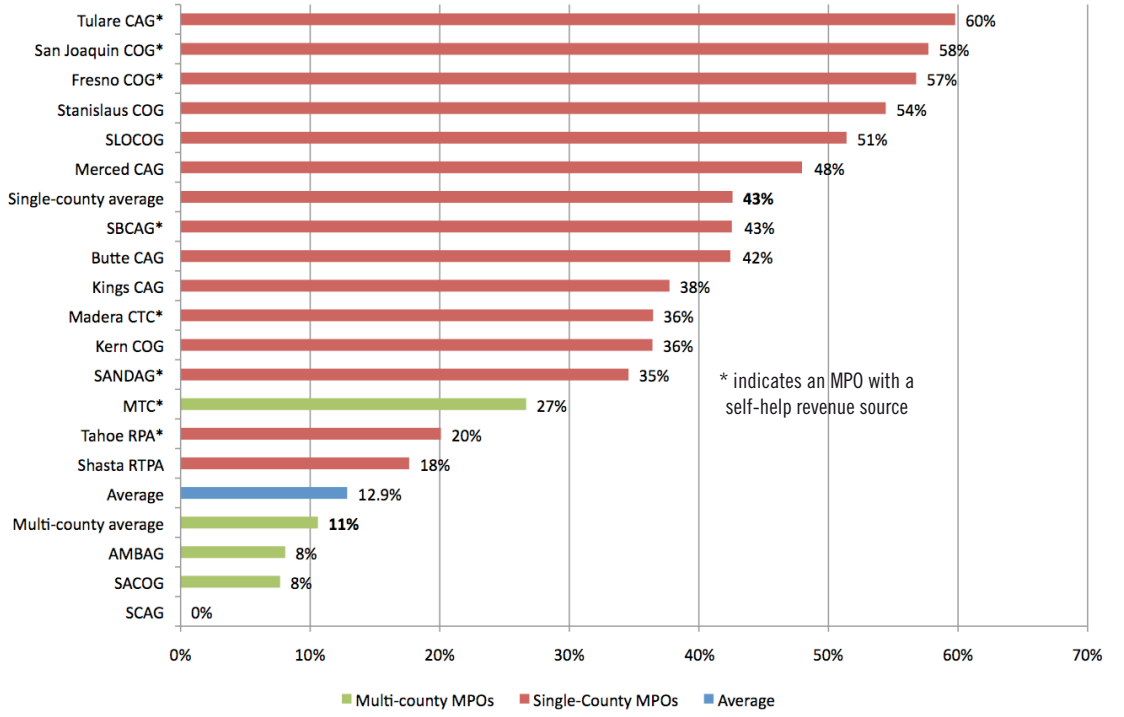
However, the project's congestion effects will still be experienced locally, and SB 375 provides no concrete assistance to localities for mitigating those local effects. For this reason especially, it is not clear that SB 375's provisions will do much, on their own, to encourage more plan-level, rather than project-level review and mitigation.

Table 13. Transportation funding sources, primary purpose, and amounts, organized by decision-maker

Funding source	Primary purpose	Amount ($billions)	% total
Funds allocated by the federal government		20.3	2.7%
Non-formula Federal Transit Administration (FTA) grants	Transit capital and operations	8.9	1.2%
Earmarks and other discretionary programs	Varies	10.5	1.4%
Auto-oriented discretionary programs	Road improvements	0.9	0.1%
Funds allocated by CalTrans		**89.5**	**11.8%**
Federal programs administered by CalTrans	Highways and local streets	3.7	0.5%
Non-motorized transportation programs	Non-motorized	0.1	0.0%
Federal airport funding	Aviation	0.5	0.1%
Interregional Transportation Improvement Plan (ITIP)	Highways and local streets	10.0	1.3%
State Highway Operation and Protection (SHOPP)	Highway maintenance	58.7	7.7%
Bicycle Transportation Account (BTA)	Non-motorized	0.0	0.0%
Proposition 1B revenues	State priority projects	5.4	0.7%
California Aid to Airports (CAA)	Aviation	0.0	0.0%
Environmental Enhancement and Mitigation (EEM)	Streetscaping, TDM/TSM	0.8	0.1%
Other		10.2	1.3%
Funds allocated by MPOs		**97.6**	**12.9%**
Regional Surface Transportation Program (RSTP)	Highways and local streets	6.7	0.9%
Congestion Management and Air Quality (CMAQ)	Transit, TCMs	6.0	0.8%
Formula-based FTA grants	Transit capital and operations	20.1	2.6%
Transportation Enhancement Act (TEA)	Streetscaping	0.2	0.0%
Regional Transportation Improvement Plan (RTIP)[3]	Regional capital projects	7.1	0.9%
Local Transportation Funds (LTF)	Transit and non-motorized	7.5	1.0%
Population-based State Transit Assistance (STA)	Transit operations	3.1	0.4%
Self-help revenue	Varies	27.7	3.6%
Tolls	Varies	19.0	2.5%
Other		0.2	0.0%
Funds allocated by air quality management districts		**0.6**	**0.1%**
Vehicle license fees		0.6	0.1%
Funds allocated by county and city governments		466.2	61.4%
Gas tax subventions	Local streets	37.3	4.9%
Self-help revenue	Varies	211.6	27.9%
General funds	Varies	31.4	4.1%
Local Transportation Funds (LTF)	Local streets, transit	68.8	9.1%
Regional Transportation Improvement Plan (RTIP)	Regional roads, transit	25.6	3.4%
Tolls	Toll road operations	7.4	1.0%
Other		84.1	11.1%
Funds allocated by transit agencies		84.9	11.2%
Transit agency revenues	Transit operations	75.6	10.0%
Revenue-based State Transit Assistance (STA)	Transit operations	9.3	1.2%
Total		**759.1**	**100%**

Source: Rose, 2010, Based on a review of current RTPs at all 18 MPOs affected by SB 375.

Figure 12. Percentage of transportation funding controlled by MPos in each region



Furthermore, SB 375 does nothing to address perhaps the most substantial obstacle to plan-level review – financial constraint. Some research has indicated that local governments may tend to substitute project-level CEQA analysis for plan-level analysis because project review has a builtin funding mechanism – namely, project developers are required to pay for CEQA reviews (Olshansky, 1996). By contrast, local governments have no continuing, significant source of funding to conduct city-wide and area-wide planning and analysis, including CEQA review. The cost of such planning is substantial; the cost of a General Plan update, for example, can range from $500,000 in smaller communities to as much as $5 million in larger ones (League of California Cities, 2007). SB 375 does nothing to address the imbalance in funding for plan-level versus project-level review, nor to enhance mitigation options for localities that accept projects (such as infill) that produce regional benefits but local costs.

6.6. Funding capacities

Overall, none of experts and local, regional or state public staff that we interviewed expressed strong confidence that the CEQA and RHNA reforms contained in SB 375 would be effective in removing barriers to smart growth development. This suggests that the bill's success in reducing GHG emissions may ultimately hinge upon the financial incentives that the bill provides for projects that conform with a sustainable communities strategy.

As we described earlier in this report, funding for transportation projects comes from a variety of sources, including federal and state gas taxes, county-level transportation sales taxes, local impact fees, and transit agency fares. In order to ensure equality across different transportation modes and geographical areas, state and federal revenues are allocated by formula to funds dedicated to specific purposes. Generally speaking, federal agencies program funding for earmarked projects and discretionary transit grants, CalTrans programs state and federal dollars dedicated toward construction and maintenance of the state highway system, MPOs program the majority of state and federal funds that are dedicated toward transit and federal funds for road improvements, and counties and cities program state funding for road improvement and self-help revenues. Table 13 (Rose, 2010) shows a summary of the funding sources and their primary uses, organized by the agency that decides how funds are used.

6.6.1. Limited and non-flexible Regional Funding Capacities

MPOs program a small part of transportation funding

Rose (2010) analyzed the revenue projections

contained in the latest RTP updates from all 18 of the MPOs governed by SB 375 and found that MPOs program roughly 13% of the total transportation revenues in these regions, which is only a quarter of the amount controlled by local governments. This is in part because MPOs mostly program state and federal funding sources, while local governments are more likely to raise their own revenue through developer impact fees and additional sales taxes. These self-help revenues alone are 50% greater than the total amount programmed by MPOs.

There is a wide regional variation in the amount of revenues controlled by MPOs

As Rose (2010) reports, the above financial analysis masks the wide variation in the amount of revenues controlled by MPOs that results from differing institutional structures in each region. Figure 12 shows the amount of total transportation revenues controlled by the MPO in all 18 regions governed by SB 375. In particular, it is important to distinguish between single-and multi-county MPOs since county transportation agencies typically program revenues from transportation sales taxes and revenues from state Local Transportation Funds and the Regional Transportation Improvement Program. In single-county metropolitan areas the MPO typically assumes the function of the regional transportation agency, which means that the MPO has authority over these revenue sources, while in California's four multi-county MPOs[30] this authority rests with the separate county transportation agencies within each region.

On average, the share of regional transportation funding controlled by single-county MPOs is almost four times as large as the share controlled by multi-county MPOs. This is due both to single-county MPOs' ability to pass transportation sales taxes and to the fact that single-county MPOs are more likely to be located in regions that contain fewer cities, and hence fewer local governments raising their own revenues and competing for transportation funding. Though self-help revenues do not in and of themselves guarantee MPOs control of the majority of regional transportation funds, it's worth noting that both the single- and multi-county MPOs that control the largest proportion of funds have their own revenue sources.[31]

Meanwhile, the county transportation commissions (CTCs) and county-level congestion management agencies (CMAs) that program transportation sales taxes and state funds in multi-county regions are not subject to the requirements of SB 375. These agencies can be quite powerful.

The Southern California Association of Governments (SCAG), which governs a region containing roughly half of the state's populations, provides an extreme example of the difficulties that multi-county MPOs may face in creating an SCS. SCAG does not program any capital transportation funds; instead all of them are programmed by the six CTCs. Each of the six SCAG counties also has its own council of governments called a subCOG, and SB 375 allows the subCOGs to take primary responsibility for preparing the SCS for their respective counties. The SCAG region is still determining which agencies will take the lead in creating the region's SCS.

A small share of MPOs' money for transportation is flexible

A substantial share of MPOs' funding may also be tied up in existing projects. Only MTC has conducted an analysis to determine what proportion of the revenues that it controls are discretionary revenues not committed to other projects, and it estimates that only $32 billion, which amounts to 14% of the revenues projected for its 2035 RTP, are discretionary funds not already committed to projects (Metropolitan Transportation Commission 2008b, 36). Rose 's interviews revealed that this estimate includes $4 million in RTIP funds that are allocated by county transportation agencies; so only $28 million, or 12% of RTP revenues, are discretionary sources controlled by the MPO. In contrast, the analysis of MTC's RTP revenues conducted by Rose (2010), which did not take into account whether revenues were already committed to projects, showed that MTC controls 27% of the region's transportation funding (Metropolitan Transportation Commission 2008b). If other MPOs have already committed a similar proportion of their transportation funding, than the overall amount of money that could be conditioned by the first round of SCSs would be closer to 6%.

30. The four multi-county MPOs are the Southern California Association of Governments, which is the MPO for the six-county Los Angeles metropolitan area; the Metropolitan Transportation Commission, which is the MPO for the nine-county San Francisco Bay Area, the four-county Sacramento Area Council of Governments; and the Association of Monterey Governments, which is the MPO for Santa Cruz, Monterey, and San Benito Counties.

31. Though MTC does not have the authority to create a transportation sales tax, it does administer tolls from the Bay Area bridges.

A small share of MPOs' money for transportation will be conditioned by the first few rounds of SCSs

The amount of money that is likely to be conditioned by the first few rounds of SCSs will likely be lower since many existing policies and projects will be exempt from the bill's requirements. SB 375 states that all projects programmed before December 31st, 2011 or contained within a sales tax ballot measure approved before December 31st, 2008 do not have to conform to an SCS. This means that roughly half of the transportation sales taxes administered by MPOs, which constitute 4% of total RTP revenues, will be grandfathered in.

Does it matter?

Though this is a relatively small share of statewide RTP revenues, it is important to note that large transportation projects draw from a variety of sources in order to fund different aspects and phases of construction, operations, and maintenance. If even a small amount of funding during a given phase, it may hold up the rest of the project. As a result, the revenues conditioned by an SCS may have more leveraging power than what the numbers above suggest.

6.6.2. California State transportation funding fails to support SB 375

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

Many recent state funding choices have not been geared to promote SB 375 objectives. In recent years California has failed to direct transportation resources to support SB 375 objectives. About two-thirds of California's state transportation revenues are currently spent on construction, rehabilitation, and repair of highways (LAO, 2007).

The priority placed by the state on funding roadways over transit does not just reflect expenditures on maintenance of an aging highway system, but also the state's capital expansion choices.[32] In particular, recent transportation bonds have funded highways, streets, and roads over transit.[33] In 2006, state voters passed Proposition 1B, which provided $19.9 billion in bond funding for transportation programs – one of the most substantial boosts to transportation funding in California in recent years. However, as mentioned above, only 20% of the funds were targeted for transit capital improvements.

The state legislature recently adopted explicit measures to exempt Prop 1B funding, still midstream and underway, from SB 375, and gave counties a few years in which to propose discretionary sales tax measures for transportation purposes that do not conform to SB 375.[34] Given the long time horizon for funding most transportation projects (and the marginal amount of new funding available to initiate new projects in any given long-term investment plan), the exemptions – especially for Prop 1B funding – mean that most transportation funds in the state will be spent for pre-SB 375 priority projects for a long time to come.

Recent state budget cuts to transit programs only worsen the problem. In recent years, the legislature has diverted substantial shares of revenue from the Public Transportation Account (PTA) – the main state funding source for transit – to cover General Fund costs. Funding for the State Transit Assistance (STA) program, which supports ongoing transit operations, was eliminated from the

32. California's ongoing program for transportation capital expansion is called the State Transportation Improvement Program (STIP). The 2006 STIP plan, covering the period from 2006 through 2011, provided about $5.9 billion for capital improvements—65% for highways and roads, 29% for transit, and 6% for transportation enhancements (including roadway beautification and bicycle and pedestrian facilities) (LAO, 2007).

33. More than half of the bond funds ($11.3 billion, or 56%) was targeted for capital improvements to state highways and local roads to reduce congestion. Another $3.2 billion (16%) was targeted for goods movement improvements to highways, rail, and ports, and related air quality improvements. The remainder ($1.5 billion, or 7%) was targeted for safety and security improvements for bridges, rail, transit, and ports (LAO, 2007).

34. In particular, transportation projects funded by an MPO are not required to be consistent with an SCS as prepared under SB 375 if they are programmed for funding on or before December 31, 2011 and if: (1) they are contained in the 2007 or 2009 Federal Statewide Transportation Improvement Program and funded under Proposition 1B; or (2) were specifically listed in a ballot measure prior to December 31, 2008 approving a sales tax measure for transportation purposes. In addition, a transportation sales tax authority need not change funding allocations approved by the voters for categories of transportation projects in a sales tax measure adopted prior to December 31, 2010. Another exemption – in this case for environmental review – was provided in SB 97 (Dutton, 2007). This measure exempts transportation and flood control projects funded by the 2006 state bonds (1B and 1E) from global warming considerations under CEQA.

2009-10 state budget. When combined, budget cuts to the STA with other cuts to public transit funds that normally would have gone towards transit capital projects, the total loss of transit funding statewide during fiscal year 2009-10 amounts to $1 billion (MTC, 2009). According to the California Public Transit Association (CPTA), this year's diversions of transit funding bring the total amount diverted to General Fund purposes by the state legislature over the past decade to more than $5 billion – $3 billion in the last two years alone (CPTA, 2009).

6.6.3. The "Gas Tax": A Declining Revenue Source for State transportation funding

Finding new funding sources for transportation, including transit, has also become a pressing concern because the value of the state's main transportation revenue source – the 18 cents state excise tax on gasoline and diesel, commonly referred to as the "gas tax"– has been eroding over time. One reason is that gas consumption has declined every year since 2005. Lower consumption, however good for the environment, makes the gas tax a less effective revenue generator. In the future, increasing fuel efficiency and a switch to alternatively powered vehicles could continue to put downward pressure on gasoline consumption and therefore on gas tax revenues (LAO, 2009a).

Another reason for the declining value of the gas tax is inflation. The current state gas tax rate has been in place since 1994. Since then, inflation has eroded the value of per gallon gas tax revenues by 29%, so that 18 cents is worth less than 13 cents today (in constant dollar terms). Between 1991 and 2006, travel on California's roads increased by an estimated 35%, but gas tax revenues (in constant dollar terms) did not increase. As a result, revenue generated per vehicle-mile traveled declined by more than 20% over the period (LAO, 2007).

Meanwhile, rehabilitation needs for the state's transportation facilities have been piling up. Revenue from gas tax and from truck weight fees has been insufficient to adequately fund needed highway maintenance and rehabilitation (LAO, 2009). As rehabilitation needs take an ever larger share of declining revenues, little is left over for new transportation projects. Proposition 1B has provided some one-time additional funding for highway rehabilitation, but it does not address the long-term mismatch between growing maintenance and rehabilitation needs and declining revenues to pay for these activities (LAO, 2009).

To provide an ongoing, stable source of funding for highway repairs, LAO and some MPOs have recommended that the legislature increase the gas tax. The legislature also should evaluate new transportation funding mechanisms as new technologies come online—technologies which could permit charging fees to drivers based on the number of miles traveled. Mileage-based fees, also advocated by the LAO and some MPOs, offer an advantage over gas taxes in that revenues are not eroded by increasing fuel economy or use of alternative fuels. A similar approach is to impose a carbon tax, which could include transportation but also be extended to other economic sectors such as energy usage. The carbon tax approach is being advocated by the Commission on the 21st Century Economy, a stakeholder advisory group created in 2008 by Governor Schwarzenegger (Nguyen, 2009). A carbon tax in the transportation sector would likely take the form of either the aforementioned gas tax increase or a VMT tax (Nguyen, 2009).

6.7. Technical Barriers

Creating a regional land use and transportation strategy that demonstrably meets greenhouse gas reduction targets is a difficult and sometimes speculative task. GHG emissions are not directly measurable, and can only be calculated based on regional travel patterns. These patterns are the aggregate result of decisions made by the millions of residents who live in a given metropolitan area, and empirical data on the relationship between planning and behavior is difficult to gather due to the large number of potentially confounding factors and the time horizon over which changes occur. Coordinated growth policies and plans often take several years to implement, and it can take several decades for their full impacts on regional travel patterns to become clear. In order to create an SCS, MPOs must have travel models that accurately forecast the effects of smart growth strategies on travel behavior over time.

However, transportation planning, and the models that inform it, has been focused on increasing the supply of transportation facilities, not on land use and transportation planning strategies that reduce travel demand. Urban Transportation Modeling System (UTMS) models were developed in the 1950s in order to determine the size and location of new highway facilities. Through the 1970s and 80s, the federal government funded the development and implementation of these models, making UTMS models standard across all MPOs. Since then, federal policy and emergent issues in regional planning have required increasingly more sophisticated modeling, both explicitly through federal air quality conformity requirements and implicitly through increased funding for new

transit systems and increased attention to the relationship between transportation and land use. However, federal funding for model development has not kept pace with the evolving issues now facing regional planning agencies (Transportation Research Board 2007), and as a result California's MPOs vary widely in their ability to model the policies that they will likely have to use in order to meet the GHG reduction targets contained in SB 375.

Though models are traditionally used to evaluate the impact of transportation policies on travelers and the environment, they are also important tools for building consensus behind these policies. Under SB 375, MPOs will need to use a well-updated regional travel model in order to demonstrate progress toward meeting regional GHG reduction targets. Rose (2010) reports that many of the planners whom he interviewed mentioned that travel models had also helped them provide information to overcome local resistance to the type of smart growth projects and regional plans that they may use to meet SB 375 goals

In order to examine what challenges MPOs may face in creating an SCS, I interviewed planning and modeling staff, experts and researchers. I also drew from four recent documents[35] that have examined the current modeling capabilities of California's MPOs and the upgrades that MPOs need to undertake in order to accurately model GHG emissions.

The conclusion is that the UTMS models currently in use at many MPOs are not well-equipped to forecast the benefits of many of the policies and programs that these MPOs are likely to use to reduce VMT under SB 375. We can identify four major shortcomings of UTMS models with respect to land use.

6.7.1. Travel models treat smart growth like conventional development

Conventional travel models overestimate the amount of trips generated by smart growth because they are based on surveys that do not differentiate between smart growth and conventional development. Instead, these surveys reflect travel behavior in the region's prevailing development pattern, which is usually large-lot single-family housing. Study data that MPOs use for trip generation and attraction rates are also biased toward conventional development patterns. The most common source of trip generation data, the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, is based on studies conducted in suburban Florida (Arrington, Cervero, 2008). As a result, most MPOs apply the same trip generation rate to a 3-person apartment located in a transit-oriented development as to a 3-person household in an auto-oriented suburb. The RTAC surveyed the sensitivity of travel models to the four "sustainable Ds" of land use—density, mix (diversity), and pedestrian environment (design), and access to destinations. It found that only one MPO, SACOG, had a model that was sensitive to all 3 factors, and that half of California's MPOs had either no capacity or had not tested their capacity to model the 3 Ds (SB 375 Regional Targets Advisory Committee 2009).

The simplest way for MPOs to improve their travel models' sensitivity to smart growth strategies is to use 4-D post-processing. Under this approach, MPOs develop elasticities that quantify how a smart growth developments' increased density, diversity, design, and access to destinations affects the amount of trips generation by these developments. These elasticities are based either upon travel studies of local smart growth developments or upon data from other study areas. MPOs then use these elasticities to adjust ITE trip generation rates for transit-oriented or mixed-use developments, thereby correcting for the ITE's suburban bias. In order to do this, an MPO must first create a land use model, which many smaller MPOs lack, and then feed in both current land use scenarios and future growth alternatives. Developing such a model is a labor-intensive process. Most of the eight San Joaquin Valley MPOs lacked land use models before embarking upon their blueprint planning process, it took a planners at two of these agencies a full years' FTE to develop a model of the four growth scenarios {Kai and Kern}. Next, MPO staff must use the model to calculate density, diversity of uses, pedestrian design, and access to

35. Rose (2010) interviewed planning and modeling staff from CalTrans and nine MPOs to discuss the shortcomings of current travel models, what upgrades MPOs had conducted in order to better analyze smart growth policies, and the cost of model upgrades. The California Department of Transportation's (CalTrans) 2007 Assessment of Local Models and Tools for Analyzing Smart Growth Strategies (DKS Associates et al 2007) discusses the technical challenges that local and regional governments face in quantifying the benefits of smart growth, and highlights efforts that planners at these organizations have made to upgrade their models. The Regional Target Advisory Committee's MPO Self-Assessment of Current Modeling Capacity and Data Collection Programs Senate Bill 375 Regional Targets Advisory Committee 2009a) asked the 18 MPOs governed by SB 375 to rate their models' sensitivity to smart growth policies as well as external factors that affect travel demand. Since different regions have different travel patterns and modeling needs, and we relied on the California Transportation Commission's (CTC) 2008 addendum to their RTP guidelines, Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process (California Transportation Commission 2008), to determine which model upgrades apply to which MPOs.

destinations for each zone within the model based on variables such as sidewalk completion, distance to transit, or street connectivity. Finally, MPOs conduct research in order to develop a mathematical model for adjusting trip generation rates according to the 4 Ds.

So far 13 MPOs have developed 4-D land use models to inform their blueprint planning process, but these models are often visioning tools capable of estimating regional-scale impacts based on highly aggregate data, and are not fully integrated with the travel model. Only 6 MPOs—SCAG, MTC, SANDAG, SACOG, Fresno and Kern COG—have a travel model that includes 4-D post-processing. Meanwhile, SLOCOG and the other San Joaquin Valley MPOs are currently working on upgrading their models. Doing so is inexpensive compared to other model upgrades; the planners that Rose (2010) interviewed reported costs ranging from $20,000 to $75,000 (San Joaquin Valley Model Coordinating Committee 2009). The cost of developing 4-D post-processing depends upon whether an MPO conducts its own studies in order to calculate elasticities or bases them on data from other regions, and upon the need for staff education. It is important to note that all of these MPOs already had developed land use models, and these cost estimates do not include initial model development costs.

6.7.2. Conventional travel models are not integrated with land use models

Even if an MPO upgrades its travel model to better capture the effect that land use has upon travel behavior, its model may still not be able to capture the reciprocal effects that transportation investments have upon land use, or the way in which transportation and land use decisions interact with other aspects of planning. Smart growth policies are founded upon the idea that transportation investments, land use planning, and a community's socio-economic characteristics are interrelated. UTMS models oversimplify this complex set of relationships. By adopting a land use scenario, conventional travel models assume that land use patterns influence the transportation system, but since the land use scenario is static, they cannot capture the transportation system's influence on development patterns. In order to model the effects of induced demand, planners must integrate their travel and land use models. In an integrated model, the land use model uses outputs from the travel model, such as commute times, as inputs in determining where people will choose to live. This produces a new land use scenario that informs the travel model, and planners run the two models in feedback until they reach equilibrium. Rose (2010) reports that only one MPO, SACOG, currently has a fully-integrated travel and land use model. Two MPOs have taken preliminary steps to a fully integrated model. SANDAG and MTC run their travel and land use models on a two- to four-year feedback cycle. Staff use the travel model developed during the previous RTP to calculate travel times between zones, and then use those to inform the land use scenario for their next RTP. However, this creates a long lag time since models are updated infrequently, and does not account for economic factors.

6.7.3. Travel models are not fine-grained enough

UTMS travel models are not fine-grained enough to account for higher density or a greater mix of uses at the level of individual developments, and normally treat all areas within a model's zone as if they have the same average characteristics. A new transit-oriented development located in a large zone will only lead to an incremental increase in overall zonal density, and the model will forecast a correspondingly small reduction in vehicle travel. Furthermore, model's zone are often too large to capture shorter-distance pedestrian or bicycle trips that take place entirely within zones, particularly in mixed-use areas (DKS Associates et al 2007).

In order to solve this problem, Rose (2010) reports that some MPOs have created more numerous and smaller zones, particularly in areas with smart growth potential. For example, the San Joaquin Valley MPOs are creating smaller zones in station areas as part of a $250,000 model upgrade package (San Joaquin Valley Coordinating Committee 2009). This method focuses only on targeted areas, and does not solve system-wide problems with aggregate models. Alternatively, MPOs can create a more fine-grained system region-wide, or use statistical techniques to simulate local-level land use characteristics at points within a zone, as SACOG does (DKS Associates and University of California, Irvine 2007), but doing so increases the time needed to perform model runs.

6.7.4. Travel models oversimplify travel behavior

Another key smart growth strategy is creating mixed-use developments and pedestrian-friendly activity centers so that people can accomplish multiple tasks in a single trip. However, since conventional models use individual trips as the basic unit of travel, they assume that each destination requires a separate trip. For example, if a resident drove his children to school in a mixed-use area, parked nearby, walked to work, and then stopped to buy groceries on the way back to his car in the evening, a conventional model would count this as three separate trips

rather than one chain of errands, overestimating the total vehicle miles traveled.

Therefore CTC recommends that the largest four MPOs and all other regions with rapid growth and established transit systems develop activity-based models (California Transportation Commission 2008). Activity-based models represent a fundamentally different approach to modeling, and are therefore more expensive to implement than other model upgrades. SACOG has developed an activity-based model, and SCAG, MTC, and SANDAG are also in the process of doing so. Both staff from MTC and SANDAG's estimate that their new models will cost roughly $2 million to build, with new surveys constituting a large share (35-75%) of the total upgrade costs.

MPOs that are not prepared to upgrade to an activity-based model can make their trip-based models more accurate by adding in new trip purposes. The costs of adding in new trip purposes varies depending upon how much new data an MPO needs to gather and how much travel patterns for the new purpose being modeled vary from the home-based commute trips that travel surveys have long focused upon. According to the CTC, adding new trip purposes to a travel model is an appropriate step for smaller, slow-growth regions, but is not an acceptable long-term substitute for an activity-based model (California Transportation Commission 2008).

Each of these shortcomings limits MPOs' ability to model reductions in GHG emissions that may result from smart growth.

Finally, though models are traditionally used to analyze the impact of transportation policies, Rose's interviews (Rose, 2010) reveal that they are equally important in implementing them. This suggests that a nuanced and complex travel model may be helpful in *creating* an SCS, but a model that is intelligible to the general public will be useful in *implementing* the SCS. Thus Rose (2010) suggests that, as MPOs upgrade their models, they should also develop methods for using their models to engage local elected officials and the general public in order to bolster consensus around regional smart growth efforts.

7. CONCLUSIONS

To conclude this report on "To what extent the Californian law SB 375 can integrate transport and land use planning and reduce transportation GHG emissions? ", we can first ask if SB 375 - as it stands- is enough. The answer is no. Indeed, as we described, the CEQA relief is weak and does not bring a significant incentive. Moreover, there is no additional fund for transit or planning and the lack of coordination with other policies remains a key issue. Finally, nowadays, there are no Monitoring Reporting and Verification (MRV) procedures to ensure the effectiveness of the process. The enforcement of SB 375 rely on direct citizen action – the so-called "citizen enforcement".

However, SB 375 is clearly a relevant first step and a significant alteration of urban development trajectory. As we analyzed, despite facing many vested interests, SB 375 is based on an extraordinary coalition and created a consensus on the necessity to implement "smart growth" approach. SB 375 sets the basis for an informed discussion among stakeholders and bring the issue of long term into the Californian mitigation strategy (idea of changing the trajectory of growth). SB 375 raises the key questions and allows stakeholders to discuss the relevant alternatives on a quantified basis. Worth to keep in mind that as many Californian urban and environmental laws, SB 375 is a procedural law which allocate the responsibilities and fix a calendar. There is a consensus that there will be a "clean up" process—based on all the analysis and discussions generated thanks to SB 375—notably to clarify the policy framework and remove some counterproductive policies.

Therefore, we can consider SB 375 as a relevant vehicle for discussion and an open-window for sustainable urban strategy.

That said, SB 375 future depends on first, political willingness, second, pressure from planners, advocacy groups, environmental lobbyist, universities, and third, on the leadership of four largest MPO (Los Angeles, San Francisco Bay, San Diego and Sacramento). As a result, the priorities appears to be to find new sources of funding for MPO (staff and models), to clean the various counter-productive policies, and to bring as much information as possible to voters (necessity and co-benefits) in order to i) enhance high-level political willingness, ii) citizen enforcement, iii) alleviate NIMBY reactions.

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APPENDIX 1: TRANSPORTATION FUNDING PROGRAM

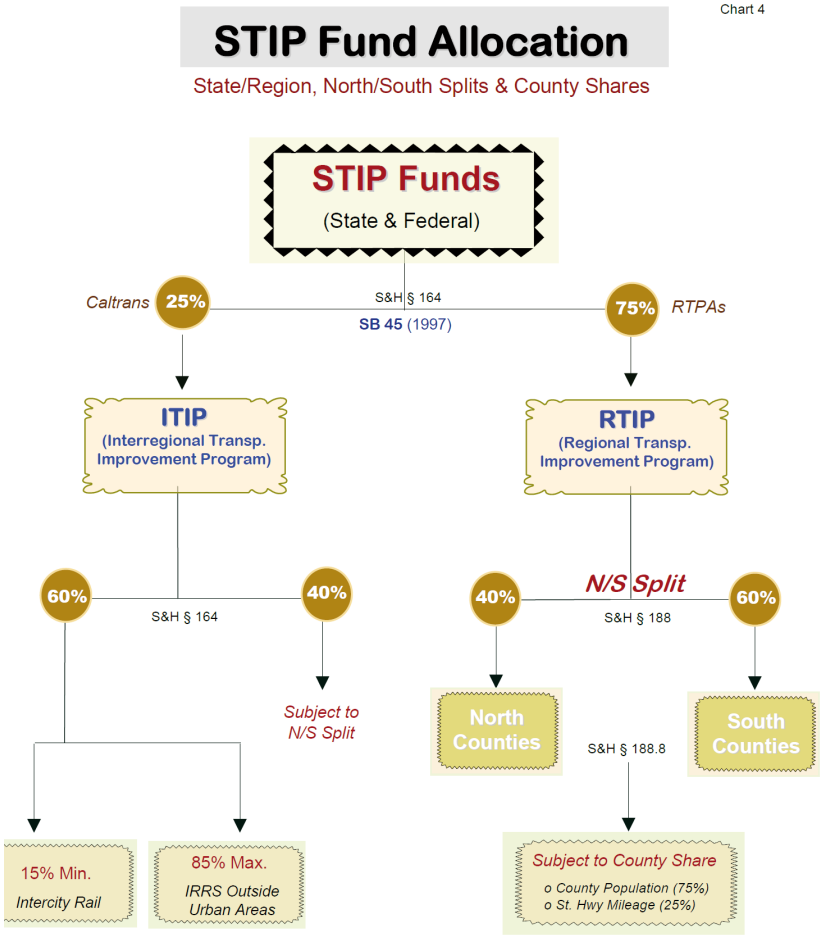
***State Transportation Improvement Program (STIP)*:** Funds new construction projects that add capacity to the transportation system. STIP consists of *Interregional Transportation Improvement Program (ITIP)* developed by Caltrans and *Regional Transportation Improvement Program (RTIP)*. STIP funding comes from a mix of state, federal and local taxes and fees.

***State Highway Operation and Protection Plan (SHOPP)*:** SHOPP provides funds for pavement rehabilitation and operational and safety improvement of the state highways and bridges.

***Traffic Congestion Relief Program (TCRP)*:** Funds 141 capital projects specified in the Traffic Congestion Relief Act of 2000. The TCRP includes roadway and transit projects located in urban areas. Funding comes primarily from gasoline sales tax revenues.

***Local Assistance Program*:** In 2007, Caltrans' Local Assistance Program oversees more than one billion dollars in federal and state funds annually available to over 600 cities, counties and regional agencies for the purpose of improving their transportation infrastructure or providing transportation services.

Chart 4



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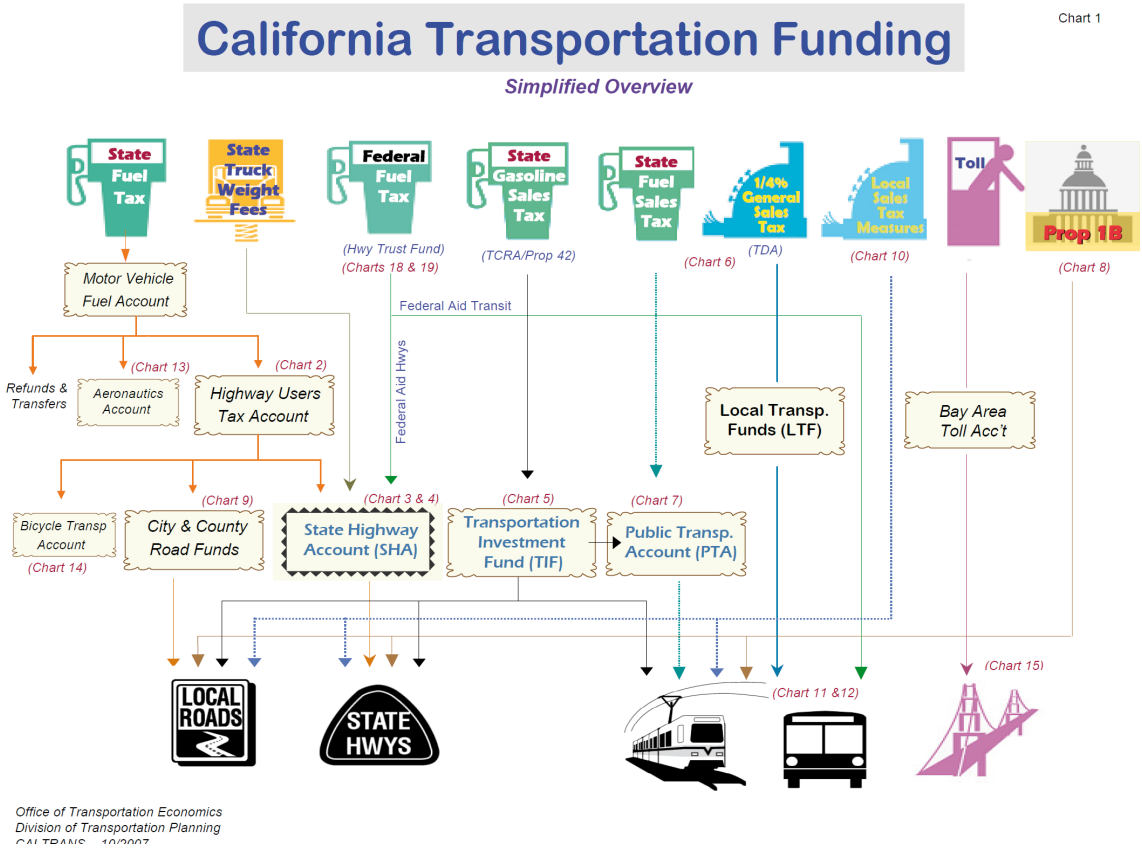
APPENDIX 2: TRANSPORTATION FUNDING SOURCES

The transportation system is funded from federal, state, and local taxes, fees and assessments, and private investment.



Federal Funds – The IRS collects the Federal fuel excise tax (18.4¢/gallon gasoline & 24.4¢/gallon diesel fuel) which are deposited in the **Highway Trust Fund (HTF)**.

- About 85% of the HTF revenues go to the Highway Account of the HTF and are apportioned by the Federal Highway Administration (FHWA) among the states as federal matching funds for projects on the SHS.
- The remaining 15% of the revenues go to the Transit Account of the HTF and are allocated by the Federal Transit Administration (FTA) to regional agencies and local transit providers in each state.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

Federal-Aid Transit Programs 2005-2009

(Estimated California Apportionments in millions of dollars)

Program	*Description/Provisions*
Section 5309 (Capital Investment Grants/Fixed Guideway) *$1,900*	Capital investment grant program for New Starts projects, fixed guideway, rail and bus modernization.
Section 5303 (Metropolitan Planning) *$54*	A program established to support the planning program for making transportation investment decisions in metropolitan areas. Apportionment by formula to States and MPOs in urbanized areas: requires 20% local match, but California is allowed to use 11.47% local matctch rate.
Section 5307 (Urbanized Area Grant) *$2,700*	A grant program for public transportation capital investment in urban areas, and transit operating assistance in areas below 200,000. Apportioned by legislative formulas based primarily on population and population density, and bus and fixed guideway revenue based on vehicle and passenger miles.
Section 5310 (Elderly/Disabled Transit) *$52*	A formula program to fund transportation services to elderly and disabled persons. Allocation is made on the basis of the number of elderly and persons with disabilities in each state.
Section 5311 (Non-Urbanized) *$85*	Provides formula grants for capital and operating services for rural and small urban public transportation systems. Includes new separate funding for Indian tribes. Establishes a new apportionment of funds: 20% are distributed by two tier-based formula based on land area, the remaining apportioned based on population in other-than-urbanized areas.
Section 5313-14 (Planning and Research)	Grants for State Planning & Research Program. Funds are allocated on a discretionary basis.
Section 5308 **(Clean Fuels)** *$195*	Provides capital grants to purchase clean fuel vehicles and related facilities, although in the past funds were transferred to the Bus Discretionary program, through 2005. Funds distributed by formula requiring 2/3 for urban areas (over 1 million) and 1/3 for under one million population.

New Programs

Section 5316 (Job Access & Reverse Commute) *$86*	Formula program that funds local programs that offer job access and reverse commute services to provide transportation for low-income individuals. Discretionary: 60% to areas with pop. over 200,000, 20% each to areas under 200,000 and non-urbanized areas. Funds may be transferred between urban and non-urban areas.
Section 5317 (New Freedom Program) *$42*	Formula grant program to encourage services and facilities, beyond those required by ADA, to address the transportation needs of persons with disabilities. Funds are allocated by formula, based upon population of persons with disabilities.
Section 5311(c) (Public Transportation on Indian Reservations)	Provides public transportation on Indian reservations through a set aside of Other-Than-Urbanized Area Program (Section 5311) funds for direct grants to Indian Tribes before allocation to the States.
Section 5320 (Alternative Transportation in Parks and Public Lands)	Funds public transportation projects in parks and public lands. Funded out of the Mass Transit Fund.

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Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

Federal-Aid Highway Programs 2005-2009

(Estimated California Apportionments in millions of dollars)

Program	CA Apportionments	Description/Provisions
Highway Bridge	$1,800	Funds Repl., Rehab. & Prev. Maint., including seismic retrofit, for all bridges, and sets aside $100 million per year for discretionary bridge projects. Up to 50% of State's Bridge funds may by transferred to NHS or STP.
Interstate Maintenance	$2,200	Funds resurfacing, restoring, rehabilitating & reconstruction of interstate system, including interchanges & overcrossings along the system. Provides flexibility to the states to fully utilize remaining un-obligated balances of prior interstate construction authorizations.
National Highway System (NHS)	$2,800	Funds 163,000 mile National Highway System, to be designated consisting of Interstate highways & major Primary roads. States may transfer up to 50% of NHS funds to other roads programs or transit (100% with Secretary's approval in states with Clean Air Act non-attainment areas). NHS funds distributed based on a formula including each state's lane-miles of principal arterials, vehicle miles, and diesel fuel use.
Surface Transportation (STP)	$3,200	Authorizes funds for highways, transit capital, bicycles & traffic operations, management & other projects on Fed-aid roads and all bridges. Funds distributed based on formula using lane miles, total VMT and contributions to the Highway Account, provideing 80% matching funds. Off the top, 10% (or $75 million/year, whichever is) is set aside for Transp. Enhancement Activity (TEA); sub-state regions receive 62.5% of the remaining funds based on population, and Caltrans receives the remaining 37.5%.
Congestion Mitigation & Air Quality (CMAQ)	$1,800	Funds projects and programs in air quality and maintenance areas which reduce transportation related emissions. Funds distributed to MPOs in each state according to a formula based on population and severity of non-attainment areas.
Others	$4,890	• Equity Bonus (Formerly Minimum Guarantee) • High Priority Projects • Border Infrastructure. Safety Incentives • Planning and Research • Other Programs

Total California Apportionments: $17,145

Safety

Highway Safety Improvement Program	$384	Funds set aside from STP for construction and operational improvements on rural roads deemed high-risk due to high fatality and incapacitating injury accidents. Funds distributed based on lane miles, vehicle miles traveled and fatalities on Federal-aid system, after Railway-Highway Crossing program setaside.
Safe Routes to School	$68	Funds projects that improve safety, and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. Funding based on relative share of total enrollment in primary and secondary schools, not less than $1 million.

Total California Apportionments: $452

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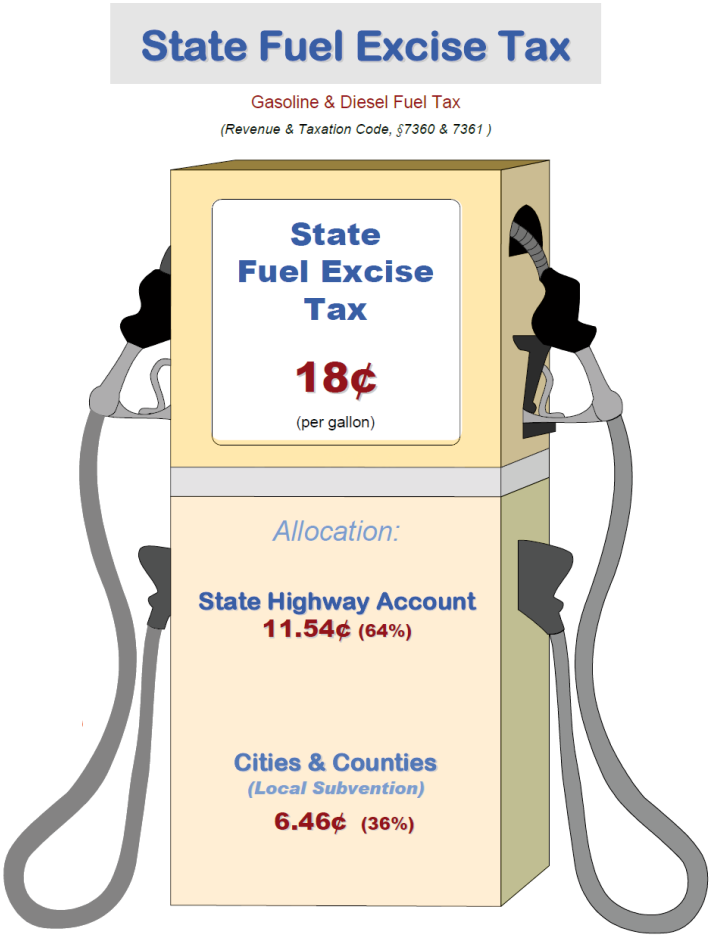
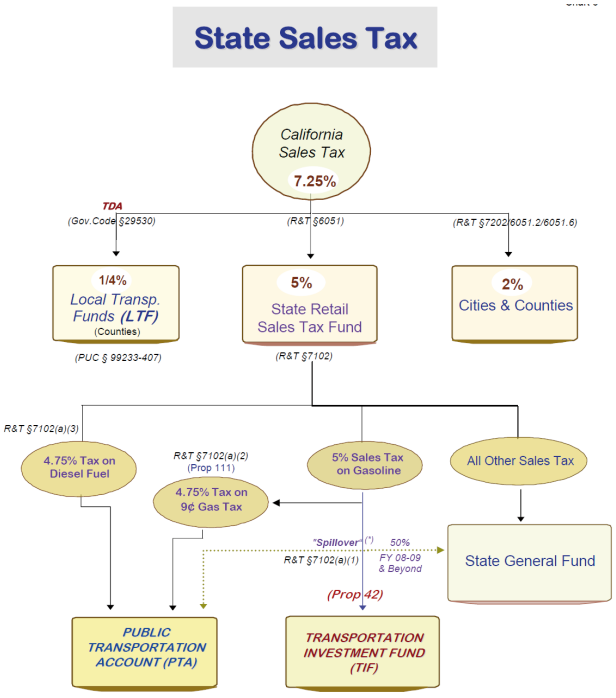
State Funds

- State Fuel Tax: The State of California collects 18¢/gallon excise tax on gasoline and diesel fuel (about $3.5 billion a year), about 65% of which is allocated to Caltrans and 35% to cities and counties (Local Subvention)



- ***Truck Weight Fees:*** The state also collects a fee on commercial vehicles based on the weight, that represent compensation for the wear and tear on the roadways (about $1 billion a year). – *(Chart 3)*

- ***State Sales Tax:*** The state also collects 7.25% sales tax, certain portions of which are earmarked for transportation:
  - The 1971 *Transportation Development Act* ***(TDA)*** earmarked ¼% of the state sales tax for transit and created a *Local Transportation Fund* ***(LTF)*** in each county to receive the money ($1 billion).
  - The TDA also extended the state sales tax to gasoline and used the revenues to compensate the state general fund for the loss of the ¼% tax. Any excess revenues from gasoline sales tax *("gasoline spillover")* are deposited in the *Public Transportation Account* ***(PTA)***. Later on, other sources of revenues were added for the PTA, including 4.75% of the diesel sales tax ($250 million) and others.



(*) **Gasoline "Spillover"** = 5% Gasoline Sales Tax – 0.25% General Sales Tax. This is the State portion of gasoline sales tax revenues in excess of the ¼% general sales tax revenues earmarked for the Local Transportation Funds by TDA.

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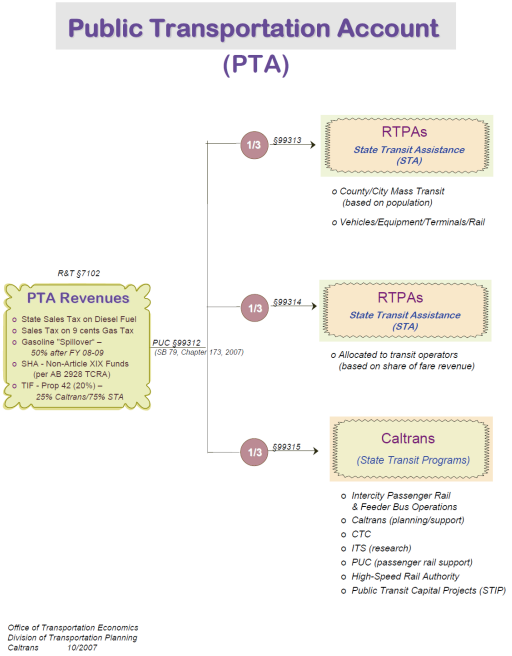

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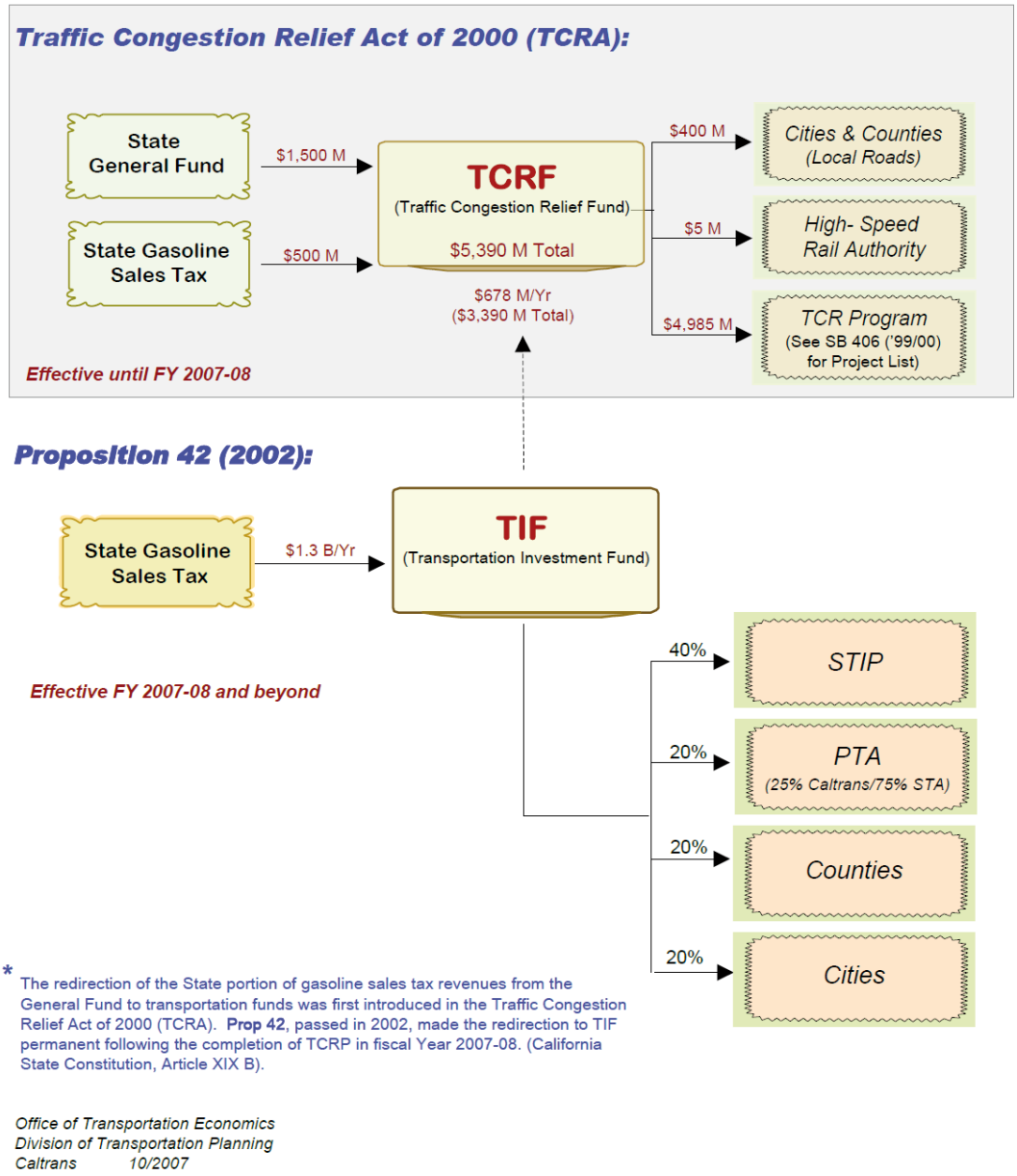
- Proposition 42 (2002): Revenues from 5% state gasoline sales tax are earmarked for transportation ($1.3 billion)

TCRA & PROPOSITION 42 *

(State Gasoline Sales Tax)



* The redirection of the State portion of gasoline sales tax revenues from the General Fund to transportation funds was first introduced in the Traffic Congestion Relief Act of 2000 (TCRA). **Prop 42**, passed in 2002, made the redirection to TIF permanent following the completion of TCRP in fiscal Year 2007-08. (California State Constitution, Article XIX B).

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- Proposition 1B Bonds: The 2006 bond act provides $19.9 billion to fund projects to relieve congestion, facilitate goods movement, improve air quality and enhance the safety and security of the transportation system.

Proposition 1B

Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006
(Authorizes $19.9 Billion in General Obligation Bonds)

Account/Program	$ Billion	Allocation Plan
Corridor Mobility Improvement Account (CMIA)	$4.5	- Performance improvements on highly congested travel corridors - Projects are nominated by Caltrans & MPOs/RTPAs - CTC develops guidelines and approves projects
Public Transp. Modernization, Improvent & Service Enhancement	$4.0	- Intercity Rail Improvements ($400 mil) - Commuter & Urban Rail Improvements ($3.6 bil) - Projects nominated by Caltrans/MPOs/RTPAs
California Ports Infrastructure, Security, and Air Quality Improvement	$3.1	- Multimodal Improvements along federal trade corridors ($2 bil) - Emission reductions related to freight along trade corridors ($1 bil - ARB) - Grants for port, harbor, ferry terminals security ($100 mil)
STIP Funding Augmentation	$2.0	Deposited in Transportation Facilities Account
Local Streets and Road Improvement, Congestion Relief, and Traffic Safety	$2.0	
State Route 99 Improvements	$1.0	
State-Local Partnership Program	$1.0	State matching funds for local projects (5-year program)
Transit System Safety, Security, and Disaster Response	$1.0	Allocated by Legislature
Highway Safety, Rehabilitation, and Preservation	$750 mil	- Augments SHOPP funding (CTC) - Includes $250 mil for traffic light synchronization projects
Highway-Railroad Crossing Safety	$250 mil	High-priority grade separation and RR crossings
Schoolbus Retrofit & Replacement	$200 mil	Reduction of air pollution & childrens' exposure to diesel exhaust
Local Bridge Seismic Retrofit	$125 mil	Provides the 11.5% required match for federal Bridge Program

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- **Local Funds**

  * **Local Sales Tax Measures (Self-Help Counties):** Counties are authorized to adopt up to 1% sales tax increase for transportation programs, subject to 2/3 voter approval, and generally for a duration of 20 to 30 years ($3.1 billion).
    - Nineteen counties have approved sales tax measures for transportation.
    - Four Transit Authorities have approved permanent local tax measures.

County Transportation Sales Tax Measures

Transit Districts (Permanent 0.5% Taxes)

- BART *(S.F., Alameda, Contra Costa)*
- San Mateo
- Santa Clara
- Santa Cruz

"Self-Help" (Temporary 0.5% Taxes)

County	Duration	Est. 2009 Rev. (million $)
Alameda	2002-22	140
Contra Costa	1989-2034	75
Fresno	1987-2027	70
Imperial	1990-2050	10
Los Angeles (1% Tax)	Permanent	1,390
Los Angeles (Measure R)	2009-2039	695
Madera	1990-2027	7
Marin	2005-25	23
Orange	1991-2041	300
Riverside	1989-2039	150
Sacramento	1989-2039	105
San Bernardino	1990-2040	165
San Diego	1988-2048	240
San Francisco	1990-2034	77
San Joaquin	1991-2041	47
San Mateo	1989-2033	70
Santa Barbara	1990-2040	30
Santa Clara	1996-2036	190
Santa Clara (BART Ext 0.125%)	2013-43 (Est.)	50
Sonoma (0.25% Tax)	2005-25	20
Sonoma-Marin (SMART 0.25%)	2009-29	30
Tulare	2007-37	25
	TOTAL	**$3,900**

Article XIIIB of the State Constitution provides the authority and requirements for the imposition of local sales tax measures subject to voter approval.

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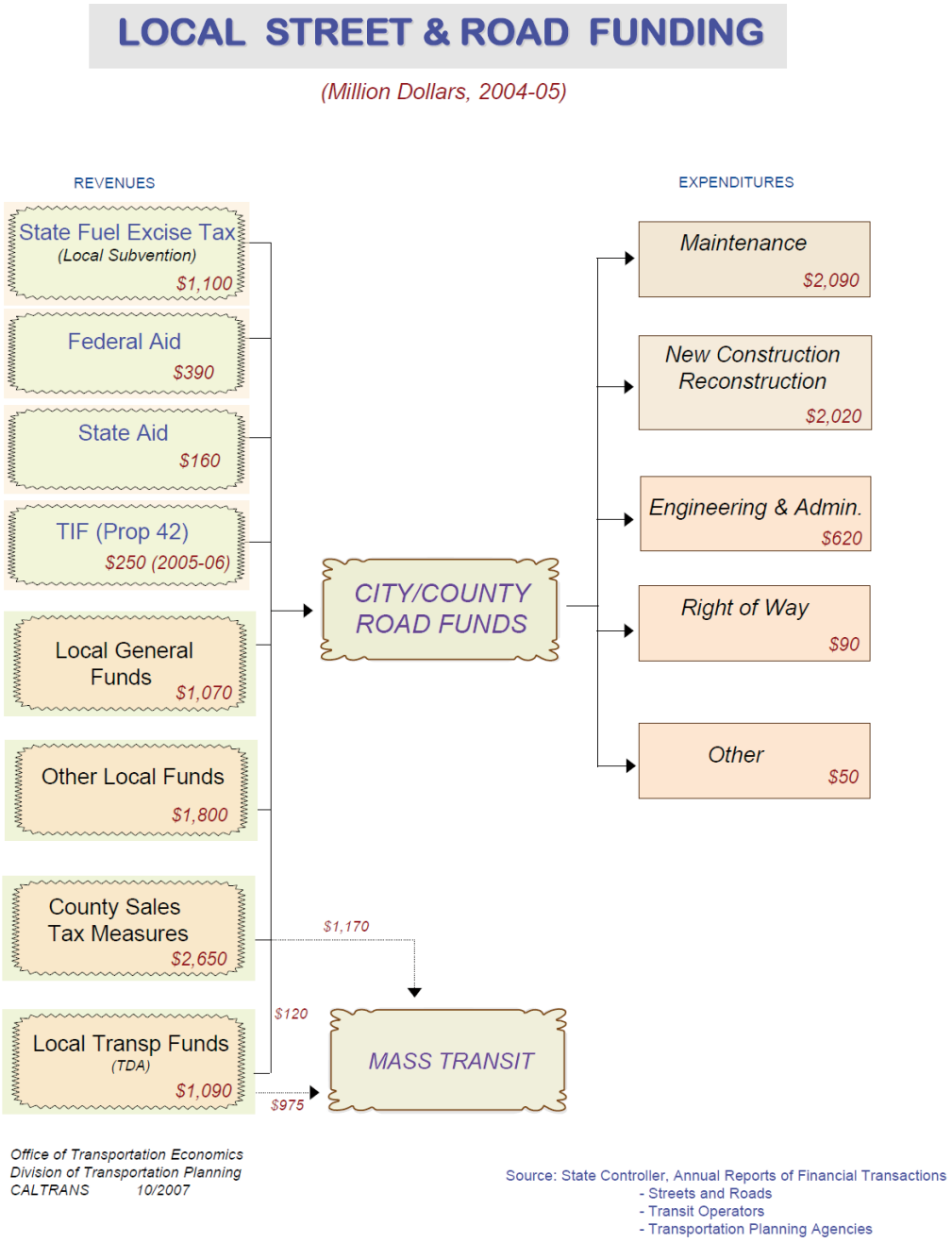
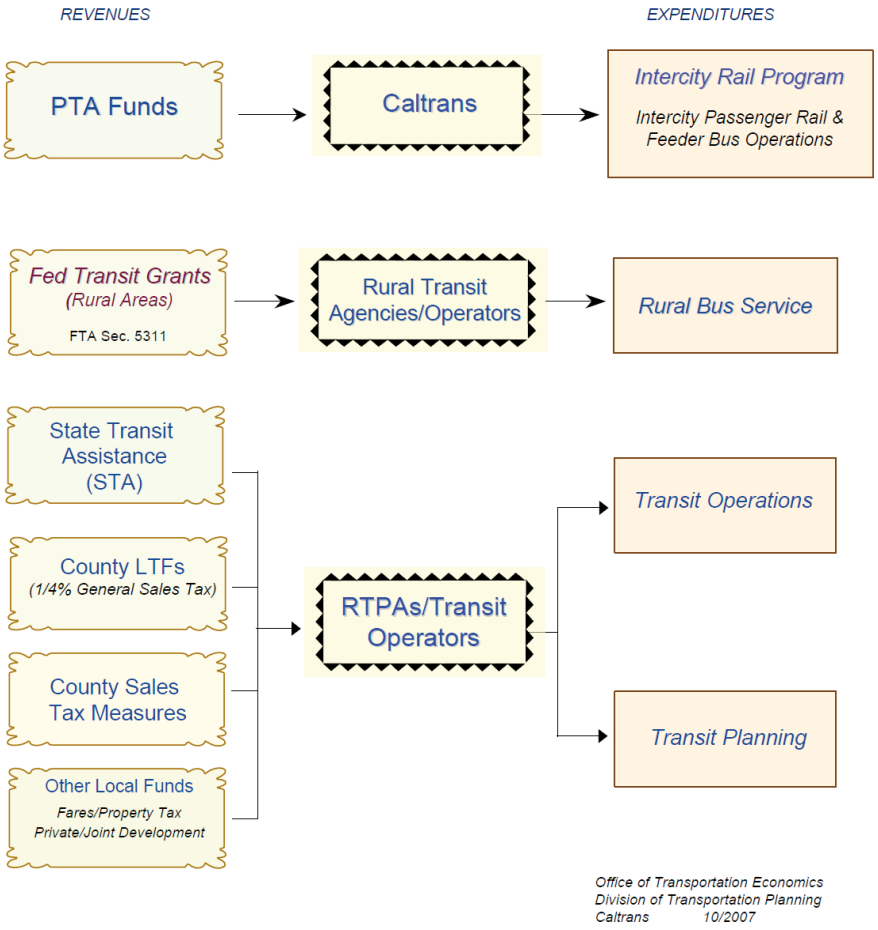
- **Transit Fares:** Provide about $1.2 billion for local transit systems.
- **Local General Funds and Other Local Funds:** Include property taxes, developer fees, street assessments, bond revenues and fines and forfeitures ($3.8 billion).



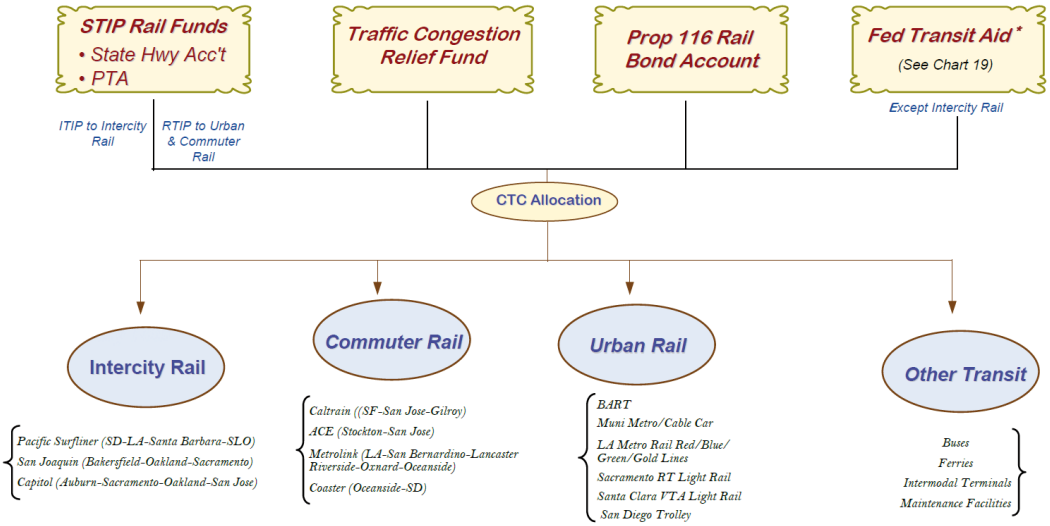
Motor Vehicle Fees

The state also collects vehicle license, registration and drivers license fees. The revenues are not earmarked for transportation projects; however, the bulk of the money is allocated to CHP and DMV for traffic law enforcement and regulations.

Transit & Rail Operations Funding



Transit & Rail Capital Funding



* In addition, Section 104(d)(2) of Fed Hwy Act (Title 23 US Code) provides funding for railway/highway crossing hazard elimination in existing and potential high-speed rail corridors.

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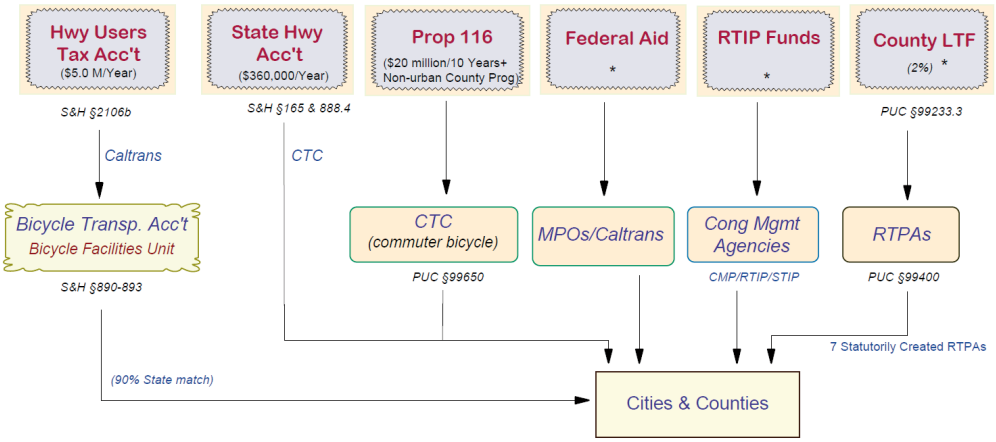
Non-Motorized Transportation Funding

(Bicycle Facilities)



*
Bicycle/pedestrian projects are eligible for funding from federal NHS, STP, TEA, CMAQP, Fed Lands Hwy & Bridge programs.
The State's EEM program and county sales tax measures also provide funding for non-motorized transportation projects.

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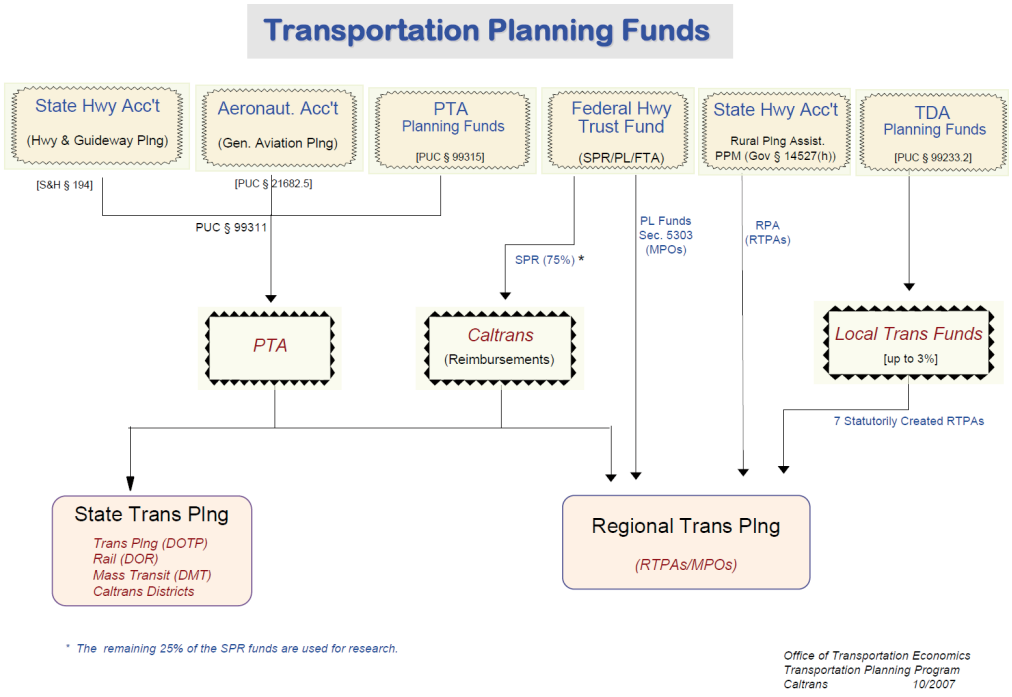
Transportation Planning Funds
State Hwy Acc't
(Hwy & Guideway Plng)
Aeronaut. Acc't
(Gen. Aviation Plng)
PTA
Planning Funds
[PUC § 99315]
Federal Hwy
Trust Fund
(SPR/PL/FTA)
State Hwy Acc't
Rural Plng Assist.
PPM (Gov § 14527(h))
TDA
Planning Funds
[PUC § 99233.2]
[S&H § 194]
[PUC § 21682.5]
PUC § 99311
SPR (75%) *
PL Funds
Sec. 5303
(MPOs)
RPA
(RTPAs)
PTA
Caltrans
(Reimbursements)
Local Trans Funds
[up to 3%]
7 Statutorily Created RTPAs
State Trans Plng
Trans Plng (DOTP)
Rail (DOR)
Mass Transit (DMT)
Caltrans Districts
Regional Trans Plng
(RTPAs/MPOs)
* The remaining 25% of the SPR funds are used for research.
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Transportation Planning Program
Caltrans 10/2007

Urban Smart Growth Strategy in California

Benoit Lefèvre (IDDRI)

OTHERS PUBLICATIONS

- X. Liu, B. Lefèvre, "Chinese Influence on Urban Africa", IDDRI, Studies N°06/12.
- E. Guérin, C. Serre, A. Ochs, "United States climate policy: What's next? EPA regulations as an alternative pathway to comprehensive federal action?, Working Papers N°15/11.
- B. Lefèvre, V. Renard, "Sustainable Developement and Urban Fabric", IDDRI, Working Papers N°08/11.

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The Institute for Sustainable Development and International Relations (IDDRI) is a Paris based non-profit policy research institute. Its objective is to develop and share key knowledge and tools for analysing and shedding light on the strategic issues of sustainable development from a global perspective.

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