California Puts on the Brakes

Courtesy Union of Concerned Scientists

By Adam Millard-Ball

Randi Lynn Beach for the *New York Times*/Redux

Ahead of the curve at Google: The internet search engine's commuters get free shuttle service to and from company headquarters in Mountain View, California. About 1,200 employees, a fourth of the total staff, take advantage of the service, which uses 32 biodiesel-fueled buses and stops at 40 locations in six counties. Bicycles—and dogs, too—are welcome.

Transportation planners know all about congestion and smog—long the most intractable challenges in California. Now they must grapple with a third challenge: climate change.

Last fall, the state legislature passed a law requiring a 25 percent cut in greenhouse gas emissions, to return them to 1990 levels by 2020. Gov. Arnold Schwarzenegger had already set an even more ambitious target, an 80 percent reduction below 1990 levels by 2050. "The debate is over," said the governor in signing his executive order in 2005. "We know the science. We see the threat. And we know the time for action is now."

With 41 percent of the total, transportation accounts for the largest single share of California's greenhouse gas emissions, according to the California Energy Commission.

BCDC

Local consequences of climate change: Sea-level Rise in the San Francisco Bay Area.

The USC Vanguard, a minivan designed for the Union of Concerned Scientists, uses off-the-shelf technology to cut emissions by over 40 percent. See it at www.ucsusa.org.

Transportation planners respond to a strict new emissions target.

Recommendations from the Governor's Climate Action Team, which includes senior representatives from all of the relevant state boards and agencies, call for this sector to shoulder a roughly equivalent share of the reductions. The team identified vehicle efficiency, biofuels, and planning measures to cut 70 million tons of carbon dioxide equivalent a year, as part of an overall program to reduce greenhouse gas emissions by 174 million tons a year by 2020.

New tailpipe standards for cars and light trucks are a centerpiece of the state's transportation efforts. Regulations drawn up by the state Air Resources Board in the wake of legislation drafted by former state assembly member Fran Pavley require a 30 percent reduction in greenhouse gas tailpipe emissions by 2016; that's nearly half the cuts from transportation.

"For vehicles, these regulations are the number one strategy for reducing global warming pollution," says Patricia Monahan, deputy director of vehicles at the Union of Concerned Scientists. "It's really fundamental."

Beyond borders

The impact of the standards reverberates well beyond California, says Monahan. She points to 11 other states that have adopted the standards and another six, including Texas and Arizona, that are considering them. Together with California, these states account for nearly half of new vehicle sales.

"The states are really leading the federal government here in recognizing that climate change is a major problem," says Monahan. "If state authority to regulate greenhouse gases is upheld, it opens up the door for further reductions down the road."

But the regulations are currently in limbo thanks to a legal challenge by the auto industry. Car makers claim that the tailpipe regulations are a surrogate for fuel economy standards, which may be set only by the federal government. The auto industry also argues that state-level climate change regulations stray into the realm of foreign policy—again, a federal prerogative. The matter had been on hold, pending a ruling in a related case, *Massachusetts v. EPA*, which was decided by the Supreme Court last month.

Alternatives

While California officials are publicly upbeat about their legal prospects, planners and legislators are already looking for alternative

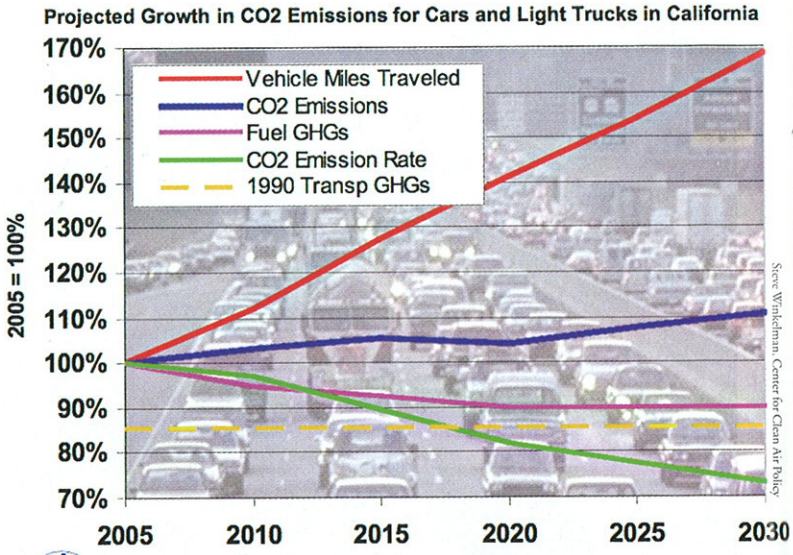
strategies to replace—or augment—the tailpipe standards. Indeed, state legislation requires the Air Resources Board to develop regulations that ensure at least as great a cut in emissions, should the tailpipe standards be overruled in court.

The low-carbon fuel standard established by Gov. Schwarzenegger requires refiners and importers to cut the carbon intensity of transportation fuels sold in the state by 10 percent by 2020. A higher proportion of ethanol blended into gasoline and more hybrid vehicles are likely ways to reach the target.

A "clean car discount" or "feebate" program would give consumers incentives to buy more fuel-efficient cars, under legislation introduced by state assembly member Ira Ruskin. Cleaner cars such as the Honda Insight would attract a rebate of up to $2,500, while a similar surcharge would be levied on SUVs and trucks such as Toyota's Land Cruiser.

The program, which would be self-financing, would apply only to new cars bought in California from 2010 on. What's more, the rebate and fee schedule would be recalibrated every couple of years, giving manufacturers a constant incentive to improve efficiency.

Projections from CCAP suggest that rising vehicle travel will more than offset the CO_2 savings from fuel-efficient vehicles, leading to a 10 percent increase in total emissions (the blue line) by 2030. Smart growth, pricing and other strategies to reduce auto use will be needed to meet California's targets.



Land use counts, too

Much of the attention in the state has focused on vehicle and fuel technologies. But land use and planning efforts to reduce vehicle travel are central to meeting the state's targets. They account for more than 10 percent of the required reductions, according to the Climate Action Team report.

Rather than creating new programs from scratch, climate change is reinvigorating a range of regional initiatives that are already under way. "Our smart growth efforts are not necessarily intended for climate," says Reza Navai, climate action program manager at Caltrans, the California Department of Transportation. "They are intended for efficient transportation and land use, but climate also benefits as a result."

"Local transportation efforts that were already under way have gotten an extra charge of relevance," agrees Steve Winkelman, manager of transportation programs at the Center for Clean Air Policy, a nonprofit think tank in Washington, D.C. "The seriousness of climate change has engaged the public more and changed the sense of public receptiveness."

Gov. Schwarzenegger's Climate Action Team projects savings of 18 million tons per year by 2020 as a result of smart growth, demand management, and pricing strategies. An additional nine million tons would come from what CAT calls "transportation energy efficiency"—things like incorporating climate considerations into regional transportation plans and incentives for cleaner vehicles.

Winkelman points to the Blueprint program in Sacramento as a model for gaining local government buy-in into a regional smart growth strategy. By concentrating development in infill locations and at transit nodes, the plan projects a reduction in auto mode share from 94 percent in the business-as-usual scenario to 84 percent under the Blueprint vision. Transit ridership would more than quadruple to 629,000 trips per day, and total vehicle emissions would fall by 15 percent if the plan were followed.

'Double whammy'

In the San Francisco Bay Area, a consortium of regional agencies has been hosting public workshops to develop a regional climate change strategy—with smart growth as a key focus.

"To achieve our target we have to go way beyond the [tailpipe] emissions standards," Ted Droettboom, regional planning program director for the three-agency Joint Policy Committee, told an overflowing workshop in February. "Smart growth is something we have to do in the long term."

"It's also a strategy related to heating and cooling," he added, referring to the region's steep temperature gradient, which causes inland settlements to experience both searing summer heat and colder winters. "To the extent that you begin to concentrate development close to the bayside, you can reduce heating and cooling needs. Smart growth has a double whammy effect."

"Climate change is going to be a major component of the next regional transportation plan," Droettboom continued. The Metropolitan Transportation Commission is starting work this year on the 2008 plan, which lays out a 25-year investment program for the region.

Some of the largest investment decisions are being made at the state level, following voter approval in November of a $20 billion transportation bond measure. A separate $3 billion housing bond earmarks $300 million for transit-oriented development and $850 million for regional planning, housing, and infill incentives.

Even though the transportation bond focuses on highway construction, Steve Winkelman sees an opportunity to use the funds to reward regions that seek to reduce vehicle travel and to give high priority to projects that tackle travel demand. "The whole idea of leveraging the infrastructure bonds is to send signals to encourage those types of [smart growth] scenarios," he says. But Winkelman acknowledges that it will be a challenge to shift the focus from simply expanding highway capacity.

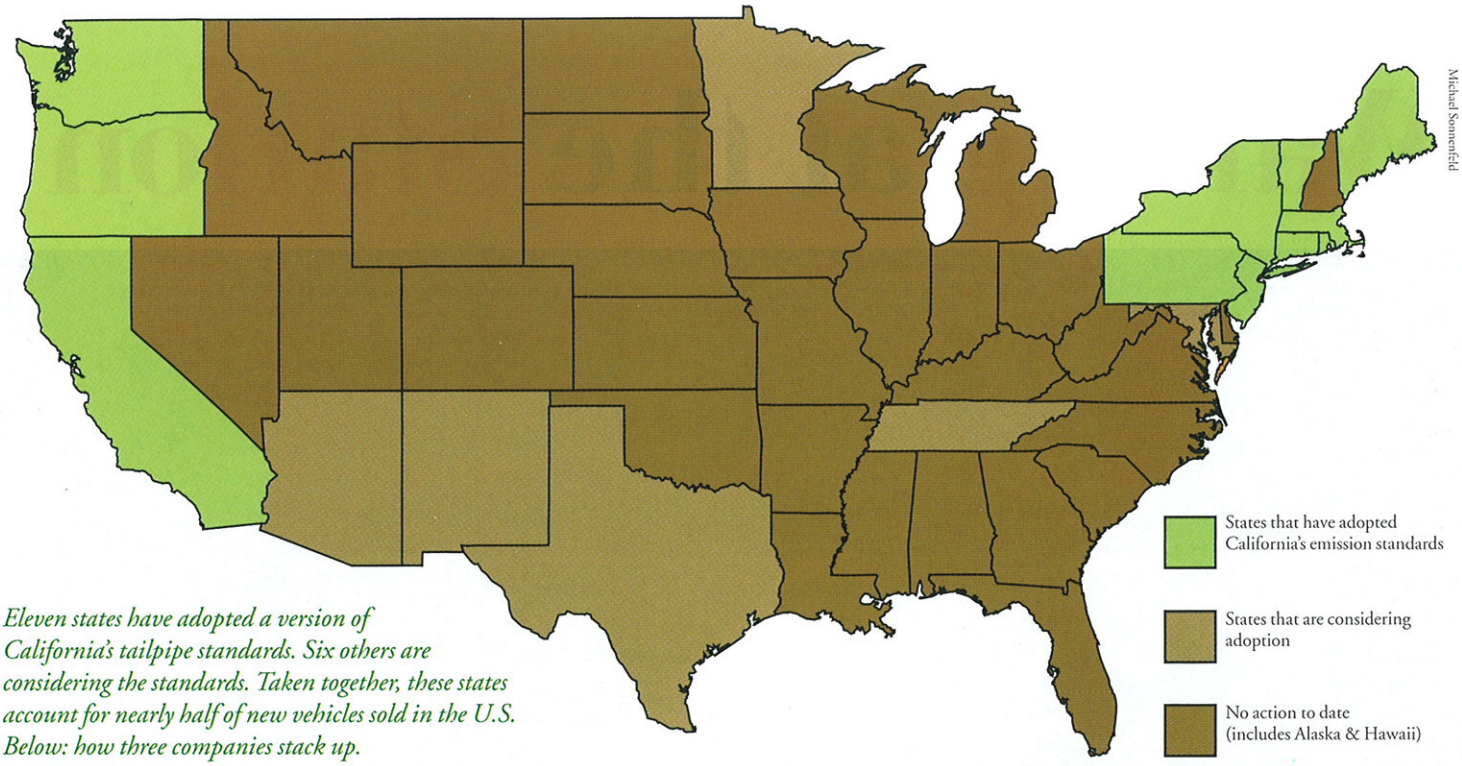
Caltrans, in contrast, sees alleviating congestion as the main benefit of the bonds. "Our analysis shows that once you obtain a relatively free-flow speed, about 45 mph, you achieve the minimum CO_2 emissions," says Reza Navai.

He dismisses fears that new highways funded under the bond will simply generate more traffic and induce transit riders and carpoolers to do more solo driving. "We don't have European cities with high transit use," he says. "We expect no shift from alternative modes."

Will technology do it all?

While California may be on course to achieve its goal of returning to 1990 emissions levels by 2020, planning to meet the more ambitious 2050 targets has just begun.

"The longer the horizon, the more speculative



Michael Sonnenfeld

Eleven states have adopted a version of California's tailpipe standards. Six others are considering the standards. Taken together, these states account for nearly half of new vehicles sold in the U.S. Below: how three companies stack up.

Company	Model	CA Vehicle Class	Average CO_2 Emissions (million metric tons)	Discount/ Surcharge
Mercedes Benz	SLK230 Kompressor	PC/T1	301	$757
	SL600	PC/T1	483	-$2,500
Nissan	Sentra	PC/T1	251	$1,668
	Pathfinder	T2	438	-$1,711
Chevrolet	Prizm	PC/T1	229	$2,062
	Tahoe K1500	T2	484	-$2,500

Michael Sonnenfeld; source Union of Concerned Scientists

you get on the strategies because we don't know what technology will hold," suggests Navai. He argues that vehicle and fuel technology is a more direct approach to reducing emissions: "If we have a cleaner fleet by 2030, then the link between travel and greenhouse gas emissions becomes weaker. Then travel itself becomes secondary to the debate."

Winkelman, in contrast, argues that taking early action on the demand side can "take the pressure off" the need for technological breakthroughs—and at the same time reduce the costs of stabilizing carbon dioxide concentrations.

"If you delay action, you have to reduce emissions a lot faster," he says. "When you take that 2050 view, you realize that delayed action is very costly in terms of dollars and climate impacts."

"It all comes down to land use," he continues. "Either we're going to be burying more nuclear waste, burying CO_2 from coal plants and hoping it stays underground, and growing monocultures for biofuels, or we're going to be pursuing denser development patterns. Frankly, we'll probably need some combination of all of the above."

If replicated elsewhere, California's 80 percent cut would put the world on track to stabilize atmospheric greenhouse gas concentrations at between 450 and 550 parts per million of CO_2 equivalent—a level that many researchers believe would significantly reduce the risks of dangerous climate change.

A target

Indeed, part of California's motivation for cutting emissions is the disproportionate impact that the state would face from climate change. Apart from rising sea levels and higher temperatures, a decline of up to 70 to 90 percent in the Sierra snowpack would wipe out a critical source of the state's water supply.

By 2050, the impact of climate change may also be reshaping California's transportation network and its planning decisions, and pushing some regions into nonattainment status under the Clean Air Act. Even a moderate temperature rise could lead to a 75 to 85 percent increase in the number of days conducive to ozone formation in Los Angeles and the San Joaquin Valley, according to a report from the California Climate Change Center at the University of California–Berkeley.

Caltrans climate action manager Reza Navai raises the prospect of rising sea level threatening shoreline highways, airports, and railroads, and of summer heat buckling asphalt. "We're in the process of assessing that," he says. "It's a long-term issue."

Resources

More to come. Watch for more articles on the fight against global warming in *Planning*'s August/September issue.

Adam Millard-Ball is a transportation planner and a doctoral student in Stanford University's Interdisciplinary Program in Environment and Resources. His research focuses on transportation and local climate policy.