WHY California should act now to secure its transportation energy future

RECOMMENDED ACTIONS that will benefit California’s economy and environment

California Action Plan 2.0
for Transportation Energy Security

www.CALSTART.org
Southern California Office
48 South Chester Avenue
Pasadena, California 91106
626/744-5600

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CALIFORNIA
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for Transportation Energy Security

The California Secure Transportation Energy Partnership
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CalSTEP Partners and History

John Boesel
President and Chief Executive Officer, CALSTART

Fred Keeley
Treasurer, City of Santa Cruz (former Speaker Pro Tempore, California State Assembly)

Arthur T. Leahy
Chief Executive Officer, Los Angeles County Metropolitan Transportation Authority (Metro)

Dr. Alan C. Lloyd
President, International Council on Clean Transportation

James D. Boyd
Vice Chair, California Energy Commission

Neil Koehler
President and Chief Executive Officer, Pacific Ethanol

Andrew J. Littlefair
President and Chief Executive Officer, Clean Energy

Jeremy Madsen
Executive Director, Greenbelt Alliance
CalSTEP Partners and History

Dennis V. McGinn
Vice Admiral, U.S. Navy, Retired

Patricia Monahan
Director of the California Office and Deputy Director, Clean Vehicles Program, Union of Concerned Scientists

Diarmuid O’Connell
Vice President, Corporate and Business Development, Tesla Motors

George Shultz
Distinguished Fellow, Hoover Institution

Sven Strohband
Partner, Mohr Davidow Ventures

Dr. James Sweeney
Stanford University; Director, Precourt Institute for Energy Efficiency

Reg Modlin
Director, Regulatory Affairs, Chrysler

Bjorn Wessman
Vice President & General Manager, Volvo Monitoring and Concept Center
The California Secure Transportation Energy Partnership (CalSTEP) is a diverse partnership of industry, automotive, business, academic, policy, and nongovernmental professionals formed in 2005 to resolve transportation energy issues for California. CalSTEP feels that California has both the ability and the need to reduce oil dependence and transportation-related emissions in the near term. CalSTEP formulates and promotes strategic policy solutions that uphold its beliefs:

- California’s petroleum dependence is inextricably linked to the state’s economic, climate, environmental, and health goals. Securing our transportation energy future should be a priority for California.
- We must address energy security and petroleum dependence now. Increasing reliance on foreign oil underscores the urgent need to alter course. Given the lack of progress at the national level, California must continue ahead on its own.
- The policies we outline in this Action Plan will bolster California’s energy security, reduce toxic emissions and grow the state’s transportation technologies industry. This bold approach will strengthen our state’s economy and set an example for others worldwide.

CalSTEP released its first Action Plan in 2007 with ten forward-thinking policy recommendations for securing California’s transportation energy security. The plan was well received and contributed to many important policy victories:

- Chapter 750, Statutes of 2007 (Assembly Bill 118 Núñez): AB 118 provides up to $200 million of vitally important funding for clean transportation technology development and deployment, as recommended in CalSTEP’s 2007 Action Plan.
- Low-Carbon Fuel Standard (LCFS): This requires a 10% reduction in the carbon intensity of transportation fuels by 2020. This regulation is in line with one of our primary recommendations, which called for the creation of an Alternative Fuels Portfolio Standard (AFPS) for transportation fuels. While the LCFS is focused on carbon emissions and CalSTEP’s AFPS was focused on fuel diversity, both aim for increased fuel choice and reduced emissions.
- Pay-As-You-Drive (PAYD) Insurance: This ties insurance rates to miles driven, creating a financial incentive to drive less. Based in part on a recommendation in our 2007 Action Plan, Assemblyman Huffman introduced a bill (Assembly Bill 2800) for PAYD insurance in California. The Assembly Member then worked with State Insurance Commissioner Steve Poizner to implement PAYD via regulation, effective summer 2009.
- Chapter 728, Statutes of 2008 (Senate Bill 375, Steinberg): California’s landmark law requires metropolitan planning organizations to align their regional transportation, housing, and land-use plans and prepare a “sustainable communities strategy” to reduce vehicle miles traveled and transportation-related emissions. The first of its kind, this bill echoes one of our primary 2007 recommendations.
- Chapter 593, Statutes of 2007 (Assembly Bill 236 Lieu): AB 236 requires the state to reduce petroleum use by our state vehicles. Our call for a “state fleet leadership challenge” helped propel this legislation. This will once again make California a standard bearer. At the same time, it will protect our state budget from oil price volatility all while reducing emissions.

As the above examples show, California has a history of policy innovation and a willingness to think big and act decisively. Policies like these drive the development and commercialization of clean, advanced technologies. However, despite this progress, pressing problems remain. This follow up to our 2007 Action Plan outlines these remaining challenges, offering a revised set of recommendations to help craft the best transportation energy security policy for our state.
Executive Summary

California must act now to ensure our transportation energy security. California’s dependence on petroleum, primarily for transportation, hampers our economy and damages our environment. Our rapidly growing reliance on foreign oil imports adds to the urgency of this far-reaching mobility, energy and security problem.

Enacting deliberate policies for energy security at the state level promises significant economic, health, and environmental benefits. With such policies in place, we can reduce pollution and mitigate damage from oil price shocks and supply disruptions. Additionally, California has the opportunity to expand entire economic sectors: vehicle efficiency and clean energy technologies. We can replace imported oil with clean and efficient alternatives produced locally, providing substantial returns for our state.

The solutions to our transportation energy security problems include diversifying fuel types and sources, increasing efficiency, and reducing dependence on the personal automobile. California must take steps to improve and promote vehicle and fuel technologies that can help reduce our petroleum dependence. However, technology alone will not provide a silver bullet for California’s transportation energy problems. We must also move ahead with strategic and sustainable growth initiatives that reduce the overall need to drive.

Despite decades of promises to wean us off of imported oil, the federal government has not enacted the policies needed to guarantee our transportation energy security. As we have seen with air quality improvement and climate change solutions, states and municipalities must take the lead. California has always acted as an innovator; once again we have an opportunity to lead by example. We should act now to secure our transportation energy future.

Reasons for Action – Managing Risks and Capturing Opportunities

California has an expensive and problematic addiction to oil. Californians spend roughly $150 million per day at the pump on gasoline and diesel,1 a number that omits several “external” social costs associated with petroleum consumption. The many serious economic, environmental, and geopolitical problems associated with oil dependence are well known. The case for near term action is getting stronger as California becomes increasingly dependent on foreign oil imports. Key arguments for acting now are outlined below:

- Reducing reliance on foreign imports: Just 15 years ago the amount of oil we got from abroad barely registered; today nearly half our consumption comes from foreign sources (see Figure ES-1). This tips California’s balance of trade and compromises national security. Almost half of this imported oil comes from the unstable Persian Gulf region, including

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1 This estimate is based on conversations with staff at the California Energy Commission. Actual daily expenditures vary by day, season, and year. The average over the period 2004 to 2009 was $152 million per day. This estimate is based on conversations with staff at the California Energy Commission. Actual daily expenditures vary by day, season, and year. The average over the period 2004 to 2009 was $152 million per day. This does not include jet fuel, which would add another $19 million on average.
Executive Summary

CALIFORNIA ACTION PLAN 2.0

25% from Saudi Arabia and 19% from Iraq. Unstable sources mean supply disruptions and related problems loom large.

- **Mitigating peak oil and price volatility threats:** Oil demand is increasing as countries worldwide emerge from the economic downturn. Experts expect this trend to continue. It is not clear production can meet increased demand at current price levels. Some speculate the global oil production peak is behind us and declines in production lay ahead. Whether or not this proves true, oil prices will remain volatile and price spikes unavoidable.

- **Improving health and air quality:** Combustion of petroleum fuels places several harmful pollutants into our air. The health and economic consequences, such as missed work days, respiratory distress, hospitalizations, and even death, take a social, emotional and economic toll on our state.

- **Reducing risks from climate change:** Petroleum use causes climate change in California. We cannot meet our climate change goals without dramatically reducing usage of petroleum fuels for transportation. The economic risks associated with climate change are large, particularly in a state subject to droughts, fires, and coastal flooding.

- **Creating jobs and maintaining a “California Advantage:**” California’s rich natural resources, strong innovation infrastructure, and can-do legislative approach have created a “California Advantage.” Already, many of the fuel and vehicle technologies needed to solve the world’s transportation energy problems are developed and manufactured here. However, other states are stepping forward to claim leadership of this space. California must act now to maintain its advantage. With the right policies and investments, we could replace much of our oil consumption with homegrown alternatives, generating jobs for our residents in the process.

The benefits of a cleaner, less petroleum-dependent California abound. It is up to us to tackle existing market failures and other barriers to ensure we reap all these potential gains. Existing efforts to address climate change, improve air quality, and accelerate green job creation also help achieve our energy security goals. However, these existing programs are not sufficient to resolve the growing energy and environmental challenges we face.

There are several market failures, barriers, and other factors that we must address in order to improve our energy security. First and foremost, the price that consumers pay at the pump for petroleum fuels omits several important “external” costs. Fuel prices are therefore relatively low from a societal perspective, encouraging a continuation of the status quo. Public funding for clean alternatives and smart growth could help to level the playing field, but the need for public investment always exceeds the available revenues.

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Furthermore, existing investment programs are not always optimized to take advantage of potential energy security benefits. Finally, inertia and existing biases conspire to support ongoing dependence on petroleum. Conventional fuels and automobile-centric development patterns are familiar, comfortable and entrenched in both our minds and our policies. Overcoming these challenges will require a sustained, coordinated, and targeted policy approach.

As we’ve shown, California’s petroleum dependence presents serious economic, environmental, and security risks. Continuing on our current path is costly, unsustainable and risky. Our state’s oil use has very real costs that are not reflected in prices paid at the pump. Increasing concerns over energy and national security, health care costs, air quality, and climate change make reducing oil dependence an urgent priority. Recent history proves the answer will not come from the federal level. California must take a leadership role on energy security just as it has on climate change and air quality. Diversifying our fuel supply, importing less oil, and improving our transportation system is the only way to address these pressing problems all at once — propelling California ahead in the clean transportation technology arena.

**CalSTEP Policy Recommendations**

To ensure a clean, secure transportation energy future, California must enact a comprehensive set of new policies. These must improve (1) overall transportation system efficiency, reducing vehicle-miles traveled, and (2) vehicle and fuel technologies. CalSTEP’s recommended actions, detailed in the following pages, emerge from the following set of operating principles and goals:

- Provide clear and consistent legislative and regulatory direction, goals, and commitments.
- Set strong standards to steer growth patterns and technology development toward a more sustainable future.
- Ensure that prices and market incentives comply with energy security goals.
- Secure public investment to complement private financing and address barriers in the technology commercialization and transition process.
- Conduct education and outreach to support energy security goals, policies, and programs.

California can minimize the existing risk in transforming the transportation sector by diversifying our portfolio to include high risk / high reward as well as low risk / low reward solutions. Advanced biofuels, vehicle electrification, fuel cells, and shifts in how land is used are elements of a longer term solution, but we cannot rely on these alone. We should also include near term solutions with lower risks and uncertainties, such as employing ethanol meeting our Low Carbon Fuel Standard, using more natural gas, and implementing proven strategies to reduce the need to drive.

CalSTEP recommends the policies and actions below to transform our transportation system, enhance energy security, and reduce exposure to petroleum-related risks. These policies must be

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*With the right policies and investments, we could replace much of our oil consumption with homegrown alternatives, generating jobs for our residents in the process.*
comprehensive, coordinated, and consistent, prioritizing sustained benefits over short-lived fixes. Also, the rules we craft to revitalize our transportation sector must be clear and remain stable over time.

**Update, codify and assign responsibility for meeting petroleum reduction targets; incorporate energy security objectives into existing relevant programs.**

A first step in improving California’s energy security is to commit to strong goals and incorporate them into state policymaking. The Energy Commission (CEC) and the Air Resources Board (CARB) have already jointly adopted petroleum reduction and alternative fuels usage goals that should greatly improve California’s energy security. Assembly Bill 2076 (Shelley, Chapter 936, Statutes of 2000), passed in response to the public’s concerns about energy security, directed CEC and CARB to adopt recommendations on a strategy to reduce petroleum dependence. The final joint report set a target of reducing petroleum fuels consumption to 15% below 2003 levels by 2020. Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005) called for alternative fuels usage targets in an effort to minimize the negative impacts of petroleum usage and strengthen the state’s economy. CEC and CARB recommended increasing alternative and renewable fuel use to 9% of on-road and off-road fuel demand by 2012, 11% by 2017 and 26% by 2022. While California’s key energy and climate agencies have adopted these targets, they have not yet been codified and there is no agency charged with achieving them. California should do the following:

- Reaffirm and codify the AB 2076 petroleum reduction and AB 1007 alternative fuels usage goals adopted by CEC and CARB. Additionally, CEC and CARB should jointly adopt longer term targets, with a hard target for 2030 and a stretch goal for 2050.
- Assign a state agency or interagency council to implement and achieve the petroleum reduction and alternative fuels usage goals. This may require statutory guidance, as it is not clear that the state currently has an agency with both the regulatory authority and technical expertise to effectively complete this task.

**Implement a transportation energy security fee; use revenues to improve mobility options and build a transportation system for the 21st century.**

California’s transportation system is inefficient, outdated, and not well-suited to supporting the state’s growth and future prosperity. The reasons for this are many and complex. At the heart of this problem is the fact that conventional petroleum fuels have relatively low prices that do not account for their full social costs. Clean alternatives seem expensive by comparison, inhibiting creation of a cleaner and more efficient transportation system. Furthermore, our inability to raise fuel taxes to keep up with inflation and growth in vehicle miles traveled means we cannot pay for upkeep of the status quo, let alone improvements to it. Thus we recommend California implement the following measures:

- Implement a petroleum fuels fee that increases at the rate of 1 cent per month for the next 10 years. This gradual and predictable price increase could be expected to reduce fuel consumption by more than 1 billion gallons per year, when fully implemented. At the same time, it would generate roughly $1 billion in
year one, increasing up to nearly $10 billion by year five and $20 billion in year ten.\(^5\)

- Use revenues from this fee to help achieve the state’s many related clean transportation and mobility goals through investments in technology, incentive programs, planning, transit, and infrastructure. These investments can offset consumer concerns over the rising cost of petroleum by providing alternative mobility options, accelerating the transition toward quality alternative-fueled vehicles and reducing the need to drive.

**Set and enforce strong and consistent vehicle and fuel standards to create a predictable business climate and accelerate innovation.**

If successfully implemented, many of the state’s planned and existing regulations and standards will reduce petroleum dependence, increase fuel diversity, and make California a more energy-secure state. CalSTEP recommends the following to accelerate innovation and progress in the clean transportation arena:

- Implement strong greenhouse gas emission standards for light duty vehicles (LEV III GHG, also known as Pavley II). The U.S. Environmental Protection Agency (EPA) and CARB have been analyzing the feasibility and potential impacts of a program resulting in a 3-6\% average annual reduction in greenhouse gas emissions.\(^6\) CalSTEP believes that a target at the high end of this range would better incentivize innovation and investment in vehicle efficiency and alternative fuels.

- Continue implementation of the state’s Low Carbon Fuel Standard (LCFS). Additionally, we recommend that California begin evaluating a second phase of the LCFS. This should include post-2020 targets that are based on analysis of the potential for reducing emissions from transportation fuels.

**Ensure adequate public funding for clean transportation and update program criteria to direct investments toward solutions that achieve multiple goals.**

Transitioning to a clean and secure transportation energy future will require public investment to support the development and deployment of advanced technologies. Private financing alone is not sufficient to move technologies from lab to market at the scale or pace needed to bring about substantial change in the transportation sector. The state and various regional agencies currently spend roughly $500-700 million per year on clean transportation technology incentive funding.\(^7\) However, many of California’s clean transportation incentive programs are scheduled to sunset over the next several years. Moreover, most of

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\(^5\) These calculations assume an elasticity of demand of -0.2 and uses as a baseline 15.2 billion gallons of gasoline and 3.3 billion gallons of diesel consumption in year 1. This is the approximate consumption projected for 2010 in the California Energy Commission’s Transportation Energy Forecasts and Analyses for the 2009 Integrated Energy Policy Report. Baseline fuel prices are assumed to be $3.25 for both gasoline and diesel. We note that this is a rough order of magnitude calculation that does not fully account for complementary policies, inflation effects, or other possible factors that might affect consumption.


\(^7\) This estimate is based on current and projected revenues and expenditures in several key incentive programs for advanced, low emission transportation technologies. The programs included in this estimate are: the Proposition 1B Goods Movement Emission Reduction and Lower Emission School Bus programs, the AB 118 Fleet Modernization Program managed by the Bureau of Automotive Repair, the AB 118 Alternative and Renewable Fuel and Vehicle Technology Program managed by the Energy Commission, the AB 118 Air Quality Improvement Program managed by the Air Resources Board, the Carl Moyer Program managed by the Air Resources Board, and the AB 593 Carl Moyer enhancement. Yearly incentive amounts for these programs are estimates based on discussions with program staff.
the existing funds go toward improving air quality, potentially missing opportunities for greater energy security and reduced greenhouse gas emissions. In order to address these issues and ensure sufficient support for the clean transportation transition, CalSTEP recommends that California:

- Direct public funding toward solutions that help California meet the three goals of improving energy security, preventing climate change, and improving air quality. This would require the state to re-evaluate its current investment strategies and legacy programs and establish new priorities and criteria.

- Maintain existing clean transportation incentive funding levels (roughly $500 to $700 million per year) as long as it is needed. Given the impending drop-off in clean transportation funding, this will require California to lay out a plan for meeting future clean transportation funding needs through new programs or extensions of existing ones.

- Ensure adequate support for clean transportation technology research and development through new and/or existing programs.

**Align state transportation funding with strategic and sustainable growth goals; provide flexibility for local and regional authorities to raise revenues for smart growth projects.**

In 2008, California passed SB 375 (Steinberg, Chapter 728, Statutes of 2008), which aims to reduce per capita greenhouse gas reductions through regional land use and transportation strategies. While this was an important first step toward more sustainable and strategic growth in California, there are many outstanding needs in the area. Existing incentives at the local and regional level favor automobile travel, encouraging sprawl and increased petroleum dependence over infill, public transit, and system-wide transportation efficiency. In order to move forward with smart growth strategies, communities in California will need support and complementary policies. Supporting measures should include the following:

- Direct state and regional transportation funds to areas and projects that are consistent with the goals and objectives of SB 375, smart growth, and reducing vehicle miles traveled. In this way, the state can support land use and growth decisions at the local level that will reduce oil dependence, cut harmful emissions, and meet citizens’ transportation needs. This requires better coordination among state agencies, potentially through the existing Strategic Growth Council, and might also necessitate performance standards for sustainable growth.

- Provide greater authority and flexibility for local and regional authorities to set fees, raise revenues, and finance smart growth projects. This could include local fees, tax increment financing, and public-private partnerships.

8 The Strategic Growth Council is a cabinet-level committee composed of agency secretaries from Business Transportation and Housing, California Health and Human Services, California Environmental Protection Agency, and the California Natural Resources Agency; the director of the Governor’s Office of Planning and Research; and a public member appointed by the Governor. The Strategic Growth Council is charged with coordinating state agencies to protect the environment and public health, increase the availability of affordable housing, improve infrastructure, and assist state and local entities in the planning of sustainable communities and meeting AB 32 goals. For more information, see: [http://www.sgc.ca.gov/about_us.html](http://www.sgc.ca.gov/about_us.html)

9 One relevant effort that is currently underway is the Caltrans Smart Mobility Framework. The goal of this effort is to develop a planning framework that will be used to guide development of products as well as assess how well products meet “smart mobility” principles and criteria. This framework could potentially be applied to various levels of plans, programs, or projects (e.g., Regional Transportation and Blueprint Plans, General Plans, corridor plans, specific development proposals, etc.) in all parts of the state. For more information, see: [http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html](http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html)
Move toward full-cost pricing for transportation in order to align market incentives with energy security goals and support cleaner transportation choices.

Conventional transportation is often under-priced. Free use of roads, subsidized parking, flat rate auto insurance, and low fuel taxes are among the ways we hide the full cost of various transportation options from consumers. The end result is that we drive more than we otherwise might, pinning the costs of this choice on our society. Moving toward user fees that more accurately reflect true social costs of transportation would steer consumers toward cleaner choices while providing revenue for additional sustainable growth options such as transit and coordinated transportation planning. The most important pricing policy is described separately above (see “Implement a petroleum fuels pollution fee”). CalSTEP recommends the following as additional high priority actions:

- Provide local and regional authorities with the ability to implement congestion pricing. Congestion pricing can reduce traffic, increase system-wide efficiency and encourage carpooling and transit usage, thereby reducing petroleum dependence. Additionally, revenues from congestion fees can finance local planning and mobility initiatives.

- Encourage local and regional authorities to re-examine parking policies that reinforce California’s dependence on the personal automobile. These include minimum parking requirements, which compel developers to provide free parking for various land uses, and other policies that lead to under-priced parking. By changing these incentives, California could encourage mixed-use developments, carpooling, and increased use of transit and other alternative modes.

- Monitor the availability of effective Pay as You Drive (PAYD) insurance policies in California. Consider changes to current PAYD regulations if they do not lead to the development and approval of PAYD insurance products that impact consumer decisions, petroleum usage, and transportation-related pollution. Options to accomplish this include a requirement for insurers to offer some PAYD product or additional guidance to insurers on how these products should be structured.

Educate key stakeholders and the public to support strategic and sustainable vehicle, fuel, and growth policies.

We need extensive outreach and education to create awareness of and build support for cleaner vehicles, fuels, and consumer transportation choices. Public education can influence decision-making to help consumers save money through better transportation decisions. General education efforts should provide information both about vehicle and fuel technologies, as well as transit and mobility options. CalSTEP recommends the following as high priority outreach and education priorities for the state of California:

- Implement an eco-driving program to help people learn how to cut their fuel consumption and save money through improved driving techniques (i.e. slower acceleration, smoother driving) and better vehicle maintenance. California can integrate this information into required coursework for a driver’s license as well as traffic school courses.

- Educate consumers about PAYD insurance policies through a labeling program or report card that details which existing policies reward customers for driving less.
Consider a California-specific certification for projects or neighborhoods that meet strategic and sustainable growth performance standards. A statewide ‘smart community’ certification system can help local governments set priorities and create plans for sustainable growth. This would also help in communicating the benefits of sustainable growth strategies to residents, developers, and other regions.

**Implement a State Fleet and Facilities Leadership plan to set an example, reduce emissions from state fleets, and support markets for clean vehicles and fuels.**

Through changes to its vehicle fleets and facilities, California can lead by example while helping to create early markets for advanced technologies. Assembly Bill 236 (Lieu, Chapter 593, Statutes of 2007) required the state to reduce petroleum usage from its fleet, calling for a 20% reduction in petroleum usage from 2003 levels. However, progress has been slow and it is not yet clear how the state will meet the goals. CalSTEP recommends increased focus on state leadership as a key way to drive change in the transportation sector:

- The Department of General Services (DGS) should develop and implement plans, complete with purchase schedules, for meeting the AB 236 goals. DGS should track progress and provide regular updates to the legislature and Governor. DGS should also consider opportunities to support the market for advanced technologies through targeted bulk purchases and public-private partnerships.

- California should explore options to use its state-owned parking structures to encourage the use of clean, advanced vehicles. By providing free or preferential parking for alternative fueled vehicles, the state could provide a valuable incentive for people to purchase and use these vehicles.

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**Given the lack of progress on energy security at the federal level, California has an opportunity to step up and lead by example yet again.**

**We Can Reduce Petroleum Use and Reap Multiple Benefits for California**

California is well-positioned to lead on energy security and clean transportation. Taking action now will reduce risks to our economy and present new opportunities. Our work toward these goals will also improve air quality, reduce global warming pollution, and put the state on a path toward a more sustainable future. Additionally, moving toward a clean transportation future offers us economic benefits as we replace imported petroleum with alternatives that are cleaner, more labor-intensive, and made here at home. All this will require a proactive and comprehensive package of policies that includes clear targets, public investment, pricing strategies, and education efforts. Most important of all, California must act to create a stable regulatory environment that provides certainty for businesses, investors and consumers. Given the lack of progress on transportation energy security at the federal level, California has an opportunity to step up and lead by example yet again.
Introduction

The California Secure Transportation Energy Partnership (CalSTEP) strongly believes that California must act now to increase energy security by reducing the state’s petroleum dependence. Our state’s over-reliance on petroleum, primarily for transportation, weakens our economy and threatens our environment. Our rapidly growing reliance on foreign oil adds to the urgency of these problems. Enacting comprehensive and stable state-level policies to assure our energy security, instead of waiting for guidance from Washington, offers economic and environmental benefits for California.

Business-as-usual is not an option. Failing to alter our transportation energy consumption promises increased pollution, deteriorating public health, greater risk of climate change, and ongoing exposure to price shocks and supply disruptions. Unless California acts now our oil import bill will only grow, resulting in an outflow of wealth from the state. Reliance on imports means missed opportunities for generating jobs in our state, and ultimately weakens our national and economic security.

With the right policies in place, the state can improve air quality and public health while reducing petroleum-related economic risks. Additionally, California can support the growth of our very own clean transportation industry, pumping money back into our local economy instead of sending it out to purchase foreign oil. California must adopt comprehensive policies to increase vehicle efficiency, provide viable alternatives to petroleum, and improve the efficiency of our land use and transportation systems. Many actions we have already taken to address air quality and climate concerns have energy security and petroleum reduction benefits as well. Similarly, new efforts to reduce petroleum consumption can yield air quality improvements and climate benefits.

This report has two major sections. First, it reviews the many compelling reasons why California should take action to reduce its dependence on petroleum. This includes analysis of California’s current transportation energy situation, review of the risks of not changing course, and examination of the benefits of a cleaner, more efficient transportation energy future. The second half of the report outlines CalSTEP’s policy recommendations. We begin with an overview of existing policy needs, providing an overarching framework for our policy solutions. We then provide specific recommendations across eight areas.
California, like other states, depends on oil for its transportation energy needs. The serious economic, environmental, and geopolitical problems associated with this addiction to oil are well known. Despite efforts to address these issues, California has a long way to go in bolstering our energy security and minimizing the dangers posed by petroleum dependence. The state’s growing reliance on imported oil adds to the urgency of our transportation energy security problems. Now is the time to act for energy security in California.

Figure 1: CALIFORNIA’S RELIANCE ON IMPORTED OIL IS GROWING RAPIDLY

By the Numbers: California’s Dependence on Petroleum

Conventional petroleum fuels and sprawling development patterns dominate in California.

- We depend on oil for approximately 93% of our transportation energy needs. Ethanol makes up the majority of the remainder.
- Californians spend roughly $150 million per day on petroleum fuels for transportation.\(^\text{11}\)
- Nearly 50% of California’s oil comes from foreign sources, up from just a small fraction 15 years ago.
- Despite high profile growth in hybrid and electric vehicle sales, 97% of light duty vehicles and 98.5% of heavy duty vehicles have conventional engines running on gasoline and diesel\(^\text{12}\)
- 73% of commute trips in California are in a single-occupant vehicle. Less than 5% of Californians commute by transit, and numbers for walking and bicycling are similar.\(^\text{13}\)

These numbers illustrate the scale of the challenge California faces in controlling our oil addiction. At the same time, they prove there’s low hanging fruit for us if only we’re willing to seize it.

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\(^\text{11}\) This estimate is based on conversations with staff at the California Energy Commission. Actual daily expenditures vary by day, season, and year. The average over the period 2004 to 2009 was $152 million per day. This does not include jet fuel, which would add another $19 million on average.


Even with more off-shore drilling and exploration in other currently closed areas, reliance on foreign oil is expected to continue growing. This has several negative implications for energy, economic, and national security.

One recent report estimated that, in 2006 alone, California spent roughly $25 billion on imported oil. This represents a large missed opportunity. Replacing even a fraction of this with clean alternative fuels produced here could generate significant economic benefits for California, in the form of new jobs at alternative fuel companies, construction of new facilities, increased tax receipts, as well as ripple effects throughout the economy.

The motivation for action increases when you consider the world’s major sources of oil. The market for petroleum fuels is dominated by OPEC, a cartel that exercises significant monopoly power. OPEC controls 80% of known oil reserves and can manipulate prices to increase profits. This monopoly adds to the long list of threats to our transportation energy supply. A growing share of California’s oil is supplied by OPEC countries, with nearly half of our foreign imports coming from just two countries in the politically volatile Persian Gulf region – Iraq and Saudi Arabia (see figure 2.)

From a national security standpoint, both our reliance on imports and the location of the world’s major oil sources are concerns. Oil dependence hampers our foreign policy. By propping up the global oil market, California and the United States are contributing to undemocratic regimes, providing funding and leverage that can be used to compromise our safety and economic well-being. Reducing our dependence on imported oil would help ensure that national security and energy policy work in alignment, not at odds. California cannot address this growing reliance on imports through in-state production of oil alone, but we can act to improve efficiency and increase use of alternative fuels.


CalSTEP Partners on Energy Security and Economic Risks

I think about our soldiers and Marines that are out there in Afghanistan...we owe it to them to do better. We owe it to them to do something about batteries to do something about energy that's created where it needs to be used. Across the board, there's a major national security reason for working hard on this issue. And there is an economic reason...We need to have sources of energy that are more stable. The price of oil is high right now and it's on the way up, believe me.

— George Shultz
former Secretary of State and Distinguished Fellow, Hoover Institution

Our country's dependence on oil undermines our foreign policy goals and US leverage because it entangles us with hostile regimes...This oil dependence cripples our foreign policy and weakens our leverage internationally and limits our options. Much too frequently we find ourselves entangled with unfriendly rulers and undemocratic nations, simply because we need their oil.

— Vice Admiral Dennis McGinn
U.S. Navy (retired)

The fact that much of the oil used in California (and around the world) comes from politically unstable regions greatly increases the risk of supply disruptions due to wars, terrorist acts, internal conflicts, and intentional disruptions. For example, 40% of seaborne oil goes through Strait of Hormuz, located between Iran and Oman. If Iran were to close off the strait, as it has threatened in the past, oil prices would spike — endangering the global economy. Indeed, the threat alone can drive up oil prices and thus harm our economy. Wars or terrorists acts in the oil-producing region pose similar problems.

A coordinated effort to reduce California's dependence on petroleum will greatly improve the state's energy security. Decreasing California's consumption of imported oil should be our first step. To the extent that imported oil can be (1) displaced through efficiency improvements and (2) replaced by in-state alternatives, we can also expect to improve California's balance of trade.

Addressing Peak Oil and Price Volatility Threats

As outlined above, reliance on oil for our transportation energy needs is a risky strategy. However, it is not just OPEC and political instability that contribute to supply disruptions and price volatility in the global oil market. Growing global oil demand itself can cause price spikes and volatility. Because prices are partially determined by traders' expectations regarding future prices, even the threat of a supply-demand imbalance can send prices soaring. Over the past several years we have seen rapid changes in the price of oil and, therefore, gasoline and diesel (see figure 3).

Moreover, oil is a finite resource and demand for petroleum fuels is set to increase as the world emerges from the economic downturn. Both OPEC and the International Energy Agency have recently revised up oil demand estimates. The


price of oil has recently topped $90, a two year high. Whether or not production will keep up with growing demand at current oil price levels is up for debate. Some speculate that the global oil production “peak” is already behind us. Others argue that enhanced oil recovery, new technology, and other expensive techniques will keep oil available for the foreseeable future.

Given the serious concerns over price volatility, supply disruptions, and national security, it is clear that relying on oil for more than 90% of our transportation fuel needs is unacceptable from a risk management standpoint. As demand for petroleum products picks up in China, India, and other regions around the world, the possibility of petroleum production through improved recovery means, the development of non-conventional oils (such as oil shales or tar sands) and new discoveries, petroleum production will be hard pressed to meet the expected future demand of 118 million barrels per day.”23

### IF THERE WAS ONE THING THAT I COULD DO TO FIX CALIFORNIA, IT WOULD BE A RADICAL SHIFT AWAY FROM OURDEPENDENCE ON PETROLEUM.

— CARB CHAIR MARY NICHOLS

*interview with Milken Institute on “Restoring California’s Promise”*24

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a devastating price spike is one that cannot be ignored. A recent report by Deutsche Bank noted that “prices will be spiking by 2012 if demand continues to grow at this rate.” Past price shocks have resulted in average oil price increases of 179%.26

FIGURE 4: FUTURE OIL SUPPLIES ARE ANYTHING BUT CERTAIN

Acting now to reduce our dependence on petroleum would help mitigate these serious risks to California’s economy. Diversification of fuel supplies and increased efficiency of fuel use is a form of insurance against price spikes, supply disruptions, and volatility in oil markets. However, we must not trade reliance on one risky fuel for another. Pursuing a balanced portfolio of alternative fuels and efficiency improvements is the best path toward energy security.

Improving Health and Air Quality

Combustion of petroleum fuels increases the levels of several harmful air pollutants in California, including smog and fine particulate matter. In fact, we have some of the nation’s worst air. Nearly all Californians live in areas that do not meet health standards for ozone and particulate matter, with 99% of residents in areas exceeding state limits and 93% exceeding federal limits.27 Petroleum-based fuels for transportation are the leading cause of air pollution in California; we cannot solve our air pollution problems until we reduce our use of these fuels.28

California’s poor air quality has real human and economic consequences, in terms of missed work days, respiratory problems, hospitalizations, and premature deaths. A RAND study estimated that meeting federal clean air standards in California would have prevented an estimated 29,808 hospital admissions and emergency room visits over 2005–2007.29 Researchers from California State University found that the costs of California’s failure on federal clean air standards in the South Coast and San Joaquin air basins alone cost the state $28 billion annually.30

30 Hall, J. and Brajer, V. “The Benefits of Meeting Federal Clean Air Standards in the South Coast and San Joaquin Valley Air Basins. 2008.
New Air Quality Standards Present Another Reason to Reduce Petroleum Usage

The new National Ambient Air Quality Standards (NAAQS) for ozone present yet another reason to move toward clean alternative fuels. Attaining these standards will be particularly challenging in the South Coast Air Basin, and will require broad deployment of transport equipment powered by clean-energy technologies. These technologies include plug-in hybrids, battery-electric vehicles, grid-powered transit and freight transport systems, and, potentially, vehicles powered by fuel cells, natural gas/electric hybrid drives, or other clean energy technologies. Preliminary analysis by the South Coast Air Quality Management District shows that, by 2030, nitrogen oxides emissions from three source categories — oceangoing vessels, aircraft, and locomotives — will, in conjunction with natural background emissions, create ozone levels approaching the current ozone NAAQS (see figure 5). This leaves no room for pollution from other sources, notably on-road vehicles — the most significant source of emissions. The South Coast will need broad deployment of clean energy technologies such as those described above by 2024; the deadline for the region to attain the current ozone NAAQS. The new ozone NAAQS proposed by EPA may require even greater deployment of clean energy technologies may be needed by 2031.

![Figure 5: 2030 OZONE IN THE SOUTH COAST AIR BASIN: NO ROOM FOR ON-ROAD VEHICLE NOX EMISSIONS](http://www.climatechange.ca.gov)  
*Source: South Coast Air Quality Management District*

Mitigating Climate Change Risks

California cannot meet its climate change goals without dramatically reducing usage of petroleum fuels for transportation. California emits roughly 1.4 percent of the World’s, and 6.2 percent of the total U.S., greenhouse gases. The transportation sector is the largest contributor to our global warming pollution, accounting for around 40% of the state total (see figure 6, which shows greenhouse gas emissions by end use). This number grows when one takes into account transportation-related emissions from oil and gas extraction and refining, much of which is for transportation purposes. Given expected population growth, it is clear that reducing petroleum usage in the state will require technological innovation and progress as well as reduction in the overall demand for transportation fuels.
The economic risks associated with climate change are large and wide-reaching. These include losses from forest fires, sea level rise, and droughts, not to mention increased electricity demand. A recent study conducted by researchers at the University of California, Berkeley estimated that annual damages from climate change in California total tens of billions of dollars per year. The report also estimated the risk that climate change poses to California real estate at $2.5 trillion.33

Petroleum reduction and climate change mitigation are intertwined. For the most part, progress on climate change will have spillover benefits for energy security, and vice versa. By reducing petroleum usage, California can make progress toward its climate change goals, set an example for the nation and the world, and put itself on a path to a more sustainable future.

Creating Jobs and Maintaining a California Advantage

California’s impressive natural resources, strong intellectual and creative infrastructure, and innovative policy environment have given us a distinct head start with regard to transportation energy security and related jobs (see “California’s Advantage” below). However, we cannot stop pushing forward. We must act now to maintain our advantage and reap “early adopter” rewards.

Many of the fuel and vehicle technologies needed to solve California’s transportation energy problems are developed and manufactured in-state. Supporting the market for these can provide direct benefits to new and existing companies in our state. Making a serious effort to transition to a cleaner transportation future will help California retain, expand, and recruit clean transportation companies. With strategic investments and smart policies, California could become an exporter of advanced technologies to other states and countries, rather than depending on imports from abroad.

Proactively transitioning toward a cleaner transportation sector could create more permanent and sustainable jobs. A recent study by the Political Economy Research Institute found that investments in clean-tech yield roughly 3 times more jobs per dollar invested than investments in fossil fuel industries. More than half of these jobs are expected to be available to unskilled workers.34

While California currently enjoys an advantage in this sector, other states and countries are moving aggressively to claim leadership. U.S. Energy
California’s Advantage

A history of forward-thinking policies and a wealth of financial, intellectual, and entrepreneurial resources have given California an advantage in the drive to improve energy security and reap related rewards. The “California Advantage” is based on the following:

- **Natural resources**: California is blessed with abundant natural resources that, when combined with efficiency, put energy security within reach. The state’s biofuel feedstocks and renewable energy resources are impressive and offer promising alternatives to conventional petroleum fuels. Additionally, despite declining production, California is the nation’s third largest oil producer, with an in-state oil industry that provides jobs for thousands of Californians.35

- **Policy leadership**: California was given a waiver under the 1970 Clean Air Act that enabled it to pursue more aggressive clean air policies than the federal government’s. Since then, California has been the model for national action on all three legs of the “transportation policy stool”: clean vehicles, alternative fuels, and smarter growth and land use patterns.

- **Innovation infrastructure**: California’s strong entrepreneurial culture and talent, access to capital, leading universities, and proactive policy environment all contribute to an “innovation infrastructure.” As a result, we can lead the development of advanced technologies and alternatives to conventional transportation fuels.

- **Ability to attract investment**: About three of every five venture capital dollars nationwide has been invested in California companies, with about $2.1 billion worth of clean energy investments in 2009 alone.36 By one estimate, every $100 million in venture capital investment leads to 2,700 jobs throughout the economy.37 California’s ability to attract investment therefore gives it a distinct advantage in the race to create green jobs.

- **Strong and growing clean transportation industry**: California companies are already leaders in clean transportation. The state has over 200 companies and organizations that are active in this broad sector.38

California is poised to lead the charge toward a secure and sustainable transportation future. Acting now would help to solidify our advantage.

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California’s Potential

California should make a concerted effort to solicit, retain and expand clean transportation investments, companies, and jobs. As noted earlier, California spends estimated $25 billion spent annually on imported oil. Redirecting just $5 billion of this (roughly 20%) toward alternative fuels produced here could generate between 26,000 and 84,000 direct and indirect jobs. California would also see increased tax revenues as the trade balance shifts and a larger share of jobs and capital remain in-state.

As outlined in the discussion of the California’s advantage, we already have a head start in the effort to develop clean alternatives to petroleum. Potential solutions to our transportation energy challenge include:

- **Next generation biofuels**: California companies lead in the development of advanced biofuels from algae, native perennial grasslands, and other sources, with industry clusters in the San Francisco Bay Area and San Diego region. With strong policies and targeted investments, advanced biofuels could become a growth industry for the state.

- **Hybrid and electric vehicles**: Several California companies are industry leaders in electric vehicles, hybridization, and electric vehicle charging infrastructure. Hybridization is an important near-term petroleum reduction strategy. In the mid-term, California could see increased use of alternative fuel hybrids. Residents here, like in the rest of the nation, are increasingly interested in plug-in vehicles. California can capitalize on this move toward electrification.

- **Natural gas and renewable natural gas (biomethane)**: California-based companies are market leaders in compressed and liquefied natural gas fuels, vehicles, and infrastructure. Natural gas is a proven near-term petroleum and carbon reduction strategy, particularly in the medium and heavy duty sector. Over the medium term, hybridization of natural gas vehicles and blending of natural gas with lower carbon fuels has the potential to further enhance these benefits. California is also starting to produce renewable natural gas (RNG) from landfills, wastewater, farm waste, and other waste streams. RNG, also known as biomethane, is an ultra-low carbon fuel that meets California’s 2050 carbon goals today and can be part of the longer term transportation energy solution.

- **Ethanol**: Ethanol currently makes up the largest share of California’s alternative fuels usage, with ethanol blends of 10% now standard in gasoline throughout the state; it is expected to remain part of the portfolio into the future. California’s leading companies, already integrated into existing our agricultural industries, have the potential to help California maintain its leadership by converting a variety of feedstocks into low-carbon ethanol that meets California’s Low Carbon Fuel Standard.

The technologies and industry sectors outlined above are examples that highlight the vast potential for in-state development of clean alternatives to petroleum. With the right policies in place, California can capitalize on its leadership, support in-state job growth, and maintain the “California Advantage.”

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39 This rough calculation is presented for illustrative purposes only. A recent report by researchers at the Political Economy Research Institute at U. Mass Amherst (Pollin, Wick-Lim, and Garrett-Peltier, 2009) found that fossil fuel investments generate 5.3 jobs per million dollars, while clean energy investments generate 16.7 jobs. We therefore assumed that $5 billion invested in in-state alternative fuels would generate somewhere between 26,500 jobs (assuming the fossil-fuel average of 5.3 jobs per $1 million invested) to 83,500 jobs (assuming the clean energy average of 16.7 jobs per $1 million invested). We note that this is a rough calculation because the numbers for clean energy jobs presented in the PERI report are not specific to transportation, and include job estimates for solar, wind, and energy efficiency. Transportation-specific numbers based solely on biofuels and other alternative fuels might be different. Furthermore, this calculation assumes that all other costs are equal and that the switch to non-petroleum alternatives does not therefore create any additional drain on the California economy. This may or may not be the case.
Secretary Steven Chu recently referred to the success of China and other countries on clean energy as a “Sputnik Moment” for the United States. China plans to invest $17 billion in central government funds in fuel economy and vehicle electrification for 5 million new energy vehicles and 15 million fuel-efficient conventional vehicles by 2020.40 Other large economies have also made strides in this area, diversifying their vehicle, fuel and electricity portfolios. California must act to maintain its lead.

It is not just in the area of vehicle and fuel technologies that California stands to gain. Sustainable and strategic “smart” growth patterns will also provide economic benefits. A recent report found that cities and counties could save billions of dollars annually through deliberate growth decisions, compact developments, and reduced infrastructure costs.41

In summary, California is well-positioned to benefit from a cleaner, more efficient transportation sector. Acting now would help to maintain existing advantages. It would also allow California to set an example and help shape national policy. California’s role as a leader is more important now than ever before, given the bleak prospects for comprehensive action on climate change and energy security issues at the federal level.

### Barriers Remain: Additional Action is Needed to Secure California’s Transportation Energy Future

The benefits of a cleaner, less petroleum-dependent California are clear. Existing efforts to address climate change, improve air quality, and generate green jobs help achieve this goal. However, existing programs are not sufficient to meet the challenges we face.

The price paid at the pump for petroleum fuels omits several important “external” costs. These costs, detailed above, include poor air quality, climate change, and economic risks, among other things. The result is that petroleum fuels have historically been underpriced, from a societal perspective, and therefore overused. This encourages the status quo and creates a major barrier to both clean transportation technology development and more efficient growth patterns. Public funding for clean alternatives and smart growth could help to level the playing field, but the need for public investment always exceeds the available revenues. Moreover, while the state already makes significant investments on the technology side, they are not always optimized to capture energy security benefits. For example, many air quality programs target diesel emissions control systems that do not provide climate change or energy security benefits. More importantly, California’s clean transportation technology investments are slated to diminish. Planning and transit are also chronically underfunded, hindering California’s efforts to reduce congestion and dependence on personal automobiles.

Conventional fuels and automobile-dependent development patterns are entrenched in both the consumer’s mind and the state’s laws. We developed our tax codes, zoning laws, air quality programs, and other regulations when dependence

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on the petroleum-fueled personal automobile was essentially taken for granted. It is no surprise that some of California’s policies unintentionally support ongoing dependence on petroleum. In truth, after decades of dependence on gasoline and personal automobiles, consumers may be hesitant to move toward unknown alternative fuels or increased use of transit. Overcoming these barriers will require a concerted effort on all fronts.

**SUMMARY: BARRIERS TO TRANSPORTATION ENERGY SECURITY**

<table>
<thead>
<tr>
<th>Barriers to developing and deploying clean transportation technology</th>
<th>Barriers to reducing the need drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Petroleum prices leave out the full social costs of consumption. Clean alternatives appear expensive by comparison, which undercuts investment in them.</td>
<td>• Relatively low petroleum prices have encouraged sprawling sub- and ex-urban development and with it reliance on the personal automobile.</td>
</tr>
<tr>
<td>• Public and private investment in advanced technologies often falls below what is needed to bring new technologies to the market. Private financing is not readily available at all stages of the technology innovation and commercialization process, and public investments in this area are slated to decrease dramatically in the near future.</td>
<td>• There is a lack of sufficient public funding for strategic and sustainable “smart” growth planning and transit operations. The result is a continuation of the status quo and a lack of alternatives to the personal automobile.</td>
</tr>
<tr>
<td>• Implementation and coordination of existing beneficial policies sometimes falls short. Air quality improvement and climate change programs are not generally designed to take full advantage of potential co-benefits such as energy security.</td>
<td>• Local and regional development and growth policies are often designed in a way that supports dependence on the personal automobile. Examples include required minimum numbers of parking spots for new developments and streets that do not always provide safe and reliable access for pedestrians and bicycles.</td>
</tr>
<tr>
<td>• Petroleum fuels are entrenched. From ubiquitous filling stations to near universal gas and diesel-powered engines, we reinforce existing options. Alternatives face consumer awareness and acceptance problems that prevent more expansive adoption.</td>
<td>• Automobile-centric development patterns are familiar, comfortable and entrenched. Infill, transit, and mixed use developments encounter consumer understanding and acceptance problems.</td>
</tr>
</tbody>
</table>

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**Now is the Time to Act**

As we’ve shown, California’s petroleum dependence presents serious economic, environmental, and security challenges. Continuing on our current path is costly, unsustainable and risky. Our state’s oil use has significant costs that are not reflected in prices paid at the pump. Increasing concerns over energy and national security, health care costs, air quality, and climate change make reducing oil dependence an urgent priority. Recent history proves the answer will not come from the federal level (see “Lack of Federal Progress Highlights Need for California to Take Action” on page 22). California must take a leadership role on energy security just as it has on climate change and air quality.
Diversifying our fuel supply, importing less oil, and improving our transportation system is the key to addressing these pressing problems all at once -- propelling California ahead in the clean transportation technology arena. Acting now is a win-win strategy. California can simultaneously improve energy security, reduce harmful air pollution, and set an example for the rest of the country. Smarter growth patterns will also lead to long term benefits in the form of reduced congestion, improved public health, and communities that are better able to meet the needs of California’s residents in the face of a growing population. Additionally, to the extent that California can reduce oil imports through efficiency and increased use of California-made alternative fuels, the state should see continued growth in clean transportation investment and employment.

California is already moving ahead with a number of programs, regulations, and investments. We must ensure continuing progress on existing climate, air quality, and alternative fuels programs. However, market failures, inertia, and other barriers stand in the way of transportation energy security. The state must therefore look for opportunities to expand and enhance existing efforts, with an eye toward achieving energy security objectives.

Lack of Federal Progress Highlights Need for California to Take Action

Since at least the Eisenhower Administration, U.S. Presidents have been talking about the need to reduce dependence on foreign oil. President Nixon launched Project Independence. Presidents Ford, Carter, Reagan, Bush, and Clinton all vowed to reduce our growing dependence on foreign imports. President George W. Bush focused on technological breakthroughs as the key to reducing our foreign oil imports, and President Barack Obama has stated a desire to reverse our dependence on foreign oil while building a new energy economy.

Despite these desires, the United States has grown increasingly dependent on imports over the past several decades, with foreign sources currently accounting for just over 50% of our oil needs.\(^{42}\) In fact, U.S. production has been declining over the past several years, while consumption has increased (see Figure 7). The federal government has failed to tackle this issue with the sort of comprehensive policies we recommend here. As with climate change and air quality, it is up to states and regions such as California to lead the way.

\(^{42}\) U.S. Energy Information Administration. How Dependent are we on Foreign Oil? [online] http://www.eia.doe.gov/energy_in_brief/foreign_oil_dependence.cfm

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**FIGURE 7:** UNITED STATES OIL CONSUMPTION, PRODUCTION, AND IMPORT TRENDS (1949-2009)

CalSTEP Policy Recommendations

For a clean, secure transportation energy future, California needs a comprehensive set of forward-thinking policies. These policies must (1) increase overall transportation system efficiency, reducing vehicle miles traveled, and (2) improve vehicle and fuel technologies. CalSTEP’s recommended actions, detailed in the following pages, emerge from the following objectives:

- **Provide clear and consistent legislative and regulatory direction, goals, and commitments.** Regulatory certainty is critical to overhauling our transportation system. In order to reduce petroleum dependence, policymakers must craft a clear and coordinated plan. Setting targets and empowering appropriate agencies with the authority and resources needed to meet them is the first step. Reduced reliance on imported oil should be an important transportation policy driver for California.

- **Set strong standards for land use and technology development.** We need ambitious but reachable performance standards for land use and technology development. Examples include vehicle efficiency benchmarks, performance standards for transportation fuels, and metrics for the impact of various land use schemes. Standards are an important component of our efforts to enhance the state’s energy security, but they are unlikely to succeed without complementary policies.

- **Ensure that prices and market incentives support energy security goals.** A properly functioning market is a very powerful force. California should ensure prices and other incentives drive industry and consumers to make choices that steer us toward cleaner, more secure transportation energy consumption. Incentives and pricing policies can help align the interests of relevant industries and consumers with those of the state.

- **Provide public investment to complement private financing and overcome transition barriers for new technologies.** While the aforementioned standards and incentives can drive private capital toward cleaner, more secure transportation solutions, we will still need additional public investment to truly succeed. Private investment is not readily available at all stages of the technology innovation process, and new technologies face cost and infrastructure challenges in their initial transition period. The amount of public support needed will depend on the strength and effectiveness of the state’s complementary policies.

- **Conduct education and outreach to support energy security goals.** Many of the solutions that are needed for a clean transportation future, including new fuel and vehicle technologies as well as many measures to reduce reliance on the personal vehicle, will require strong outreach and education efforts in order to ensure public understanding and acceptance.

Increasing our energy security will require a balanced portfolio of near- and long-term strategies and technologies.
Increasing our energy security will require a balanced portfolio of near- and long-term strategies and technologies. CalSTEP recommends that California minimize the risk inherent in transforming the transportation sector by investing in both long-term strategies with higher risks and rewards and near-term strategies with lower risks and rewards. Longer term strategies include next generation biofuels, vehicle electrification, and fuel cells. These technologies could yield substantial energy security, climate, and air quality benefits if successfully deployed. However, questions remain about consumer acceptance, cost, and infrastructure for these technologies. Solutions for the near term include low carbon fuels such as ethanol meeting the requirements of the Low Carbon Fuel Standard, low-carbon biofuels, and natural gas (particularly for heavy duty applications). Indeed, some of California’s existing obligations may actually require the widespread use of flex-fueled vehicles that can run on E85 produced in a low carbon and sustainable manner. In the medium term, alternative fuel hybrids could play a role. A diversified portfolio is the best strategy to meet our transportation energy needs.

While we have focused primarily on technological solutions thus far, California must also reduce dependence on the personal automobile. This requires changing how we plan, build and grow our communities. Here too, a balanced approach is best. Policies and incentives to influence growth patterns have great impact over the longer term, but will not suppress petroleum usage immediately. Conversely, changes in road pricing, transit funding and parking regulations can change consumer decisions and increase transportation efficiency today. Thus, we recommend pursuing both types of policies.

CalSTEP recommends the policies and actions outlined below to transform our transportation system, improve energy security, and reduce exposure to petroleum-related risks. These policies must be comprehensive, coordinated, and consistent, with an eye toward long-term benefits and goals. The policy recommendations outlined here are complementary, and will be most effective if implemented as a package. These actions can help California avoid the economic, environmental, and security costs inherent in our current transportation energy path, offering us a more secure and prosperous future.

Petroleum Reduction Goals, Commitment, and Authority

*Update, codify and assign responsibility for meeting petroleum reduction targets; incorporate energy security objectives into existing relevant programs.*

California’s key energy agencies, the Energy Commission (CEC) and the Air Resources Board (CARB), have jointly agreed to petroleum reduction and alternative fuels usage targets for the next 10-12 years (see “California’s Petroleum Reduction and Alternative Fuels Goals,” below). These targets, required by previous legislation, call for the state to reduce petroleum usage to 15% below 2003 levels by 2020, and to increase alternative fuels usage to 26% by 2022. However, there is no agency in California charged with achieving these goals. While many planned and existing policies are steering the state in the right direction, no one is tracking progress and the relevant state agencies generally do not include petroleum reduction in their funding and regulatory decision-making processes.

In order to ensure progress, CalSTEP believes that California needs to commit to enhancing energy security by reducing oil usage and diversifying our fuel supply. The following are key steps that
California should take with regard to integrating petroleum reduction into policymaking:

- Reaffirm and codify the AB 2076 goal of reducing oil consumption by 15% below 2003 levels by 2020 and the AB 1007 goal calling for 26% alternative fuel usage by 2022. These should become policy drivers factored into all relevant rule making procedures. These goals should be reached in concert with efforts toward reducing global warming pollution. We should look for opportunities to simultaneously reduce petroleum dependence, cut global warming pollution, and increase use of low carbon alternative fuels. Additionally, the Energy Commission and the Air Resources Board should jointly adopt longer term targets, with a hard target for 2030 and a stretch goal for 2050, and should make recommendations to the legislature based on these targets.

- Assign responsibility for implementation and achievement of the petroleum reduction and alternative fuels usage goals. There are several existing agencies within California that can impact petroleum and alternative fuels usage.

### California’s Petroleum Reduction and Alternative Fuel Goals

The energy security and petroleum dependence concerns that are motivating this report are not new. Past legislation called for petroleum reduction and alternative fuels targets that were jointly adopted by CARB and CEC:

- **Petroleum Reduction:** In response to the public’s concerns about oil price volatility, supply shortages, and refinery outages, the California Legislature passed Assembly Bill 2076 (Shelley, Chapter 936, Statutes of 2000). This bill directed California’s key energy agencies to develop and adopt recommendations on a California strategy to reduce petroleum dependence. The final report, jointly adopted by CARB and CEC, set a target of reducing petroleum fuels consumption to 15% below 2003 levels by 2020.43

- **Alternative Fuels Usage:** Motivated by a desire to both (1) minimize the negative impacts of petroleum usage and (2) strengthen the state’s economy, the California Legislature passed Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005). This bill directed CEC, in partnership with CARB, to develop and adopt a plan to increase alternative fuels usage in California. CEC and CARB jointly adopted the final report, recommending that the state increase alternative and renewable fuel use to 9% of on-road and off-road fuel demand by 2012, 11% by 2017 and 26% by 2022.44

Additionally, California has several other policy goals that are relevant to the state’s efforts to reduce petroleum consumption and increase alternative fuels usage. These include improved air quality, significant greenhouse gas emissions reductions mandated by Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006), and in-state biofuels production goals as laid out in the Bioenergy Action Plan.

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The California Air Resources Board (CARB), for example, has broad power to regulate vehicles and fuels. The Energy Commission has a thorough understanding of our transportation energy needs and manages the largest share of the state’s alternative fuel and advanced vehicle incentive funds. Caltrans, the California Transportation Commission, and local and regional planning organizations have the power to alter land use and meet transportation demand. Energy security crosses many jurisdictions; achieving it may require an interagency council to ensure coordination and monitoring.

The recommendations above would better position California to tackle our energy security and petroleum dependence challenges. With increased coordination and focus on this issue, we could identify opportunities and incorporate petroleum reduction into new and existing programs. It is not clear that the state currently has an agency with both the regulatory authority and the economic and technical expertise to effectively address the transportation energy security problem. Ultimately, it is very likely that the agency or agencies charged with reducing California’s petroleum usage would need statutory guidance to fully incorporate petroleum reduction considerations into relevant regulations and programs.

Transportation Energy Security Fee and Reinvestment

Implement a transportation energy security fee; use revenues to improve mobility options and build a transportation system for the 21st century.

California’s transportation system is inefficient, outdated, and not well-suited to supporting the state’s growth and future prosperity. Prices for conventional petroleum fuels are relatively low and do not reflect the full social costs of petroleum consumption. This lies at the root of California’s transportation energy security and environmental problems. Relatively low gasoline and diesel prices make weaning off these fuels seem cost-prohibitive. This is one of the main barriers inhibiting investment in vehicle efficiency and alternative fuels. Historically low prices at the pump also enable sprawling developments and excessive reliance on the personal automobile.

California’s transportation infrastructure is crumbling because we have not raised fuel taxes to keep up with inflation and increased vehicle miles traveled. California last increased the gas tax, which is used for transportation infrastructure investments, in the early 1990’s. Since then, buying power has shrunk while infrastructure spending needs have ballooned. Today’s unmet transportation infrastructure needs in California have been estimated at roughly $16 billion per year.\(^45\) Transit, planning, and clean transportation technologies also suffer from chronic funding shortfalls. With these issues in mind, CalSTEP recommends the following measures:

- Implement a petroleum fuels fee that increases at the rate of 1 cent per month for the next 10 years. This increase would provide a slow, predictable, and ultimately substantial increase in the price of gasoline. This fee would help to close the gap between the costs for conventional technologies and cleaner alternatives. It would also help drive consumers toward more sustainable transportation and land use decisions. Once fully implemented, the additional fee could be expected to reduce petroleum

consumption by roughly 5% while generating billions of dollars in revenues (see Table 1).\footnote{These calculations use as a baseline 15.2 billion gallons of gasoline and 3.3 billion gallons of diesel consumption in year 1. This is the approximate consumption projected for 2010 in the California Energy Commission’s Transportation Energy Forecasts and Analyses for the 2009 Integrated Energy Policy Report. Baseline fuel prices are assumed to be $3.25 for both gasoline and diesel. Revenues and fuel savings are estimated using a price elasticity of demand of -0.2. We used this low estimate because of the fact that we expect complementary policies to drive change in this sector that cannot be attributed to this fee. Inflation is assumed to be 2.785% per year, which a rough average over the past 20 years. We note that this is a rough order of magnitude calculation that does not fully account for complementary policies, higher than expected inflation, or other possible factors that might affect consumption.}

**TABLE 1:**
**REVENUES AND FUEL SAVINGS FROM PETROLEUM FUELS FEE**

<table>
<thead>
<tr>
<th>Year</th>
<th>Average fee for the year</th>
<th>Fee Revenues in 2010 dollars</th>
<th>Estimated Petroleum Fuel Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$0.06</td>
<td>$1.1 billion</td>
<td>50 million gallons</td>
</tr>
<tr>
<td>Year 5</td>
<td>$0.54</td>
<td>$9.7 billion</td>
<td>550 million gallons</td>
</tr>
<tr>
<td>Year 10</td>
<td>$1.14</td>
<td>$19.9 billion</td>
<td>1.04 billion gallons</td>
</tr>
</tbody>
</table>

- Use fee revenues to help meet the state’s many related clean transportation needs. These funds can offset the rising cost of petroleum fuels by financing improved transportation infrastructure, alternative mobility options, development of efficient and alternative fueled vehicles — and, ultimately, better land use planning that makes driving less necessary. In order to ensure these potential gains, the state should do the following:
  - Invest in clean transportation technologies and provide incentives to increase the availability and affordability of clean vehicles and fuels. See the recommendation entitled “Ensure adequate funding for clean transportation and update program criteria” below for further discussion of existing programs and needs in this area.
  - Provide funding for smart growth planning and implementation. This should include blueprint planning, intelligent transportation systems, and construction of infrastructure that is consistent with smart growth principles.
  - Invest in transit in order to provide alternative mobility options in areas where practical. This should include funding for operations and maintenance in addition to capital investments.
  - Provide funding for maintenance of existing transportation infrastructure.

All of these investments would ultimately help reduce costs to businesses and consumers by increasing the overall efficiency of our transportation system. In order to make the best use of revenues from this fee, California may want to consider changes to Article XIX in the State Constitution, which severely limits the potential uses of any fees levied on transportation fuels.

A well-designed petroleum fuels fee could be a very powerful tool for change. Support for some form of higher fuel taxes comes from both ends of the political spectrum, with many describing such programs as a clear “win-win.” The petroleum

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The transportation energy security fee could simultaneously increase investment in clean transportation solutions, drive consumers toward efficient and sustainable transportation choices, and provide revenues for investment in a 21st century transportation system.
U.S. Petroleum Fuel Prices and Taxes are Low by Global Standards

Prices for petroleum fuels in the United States are quite low by global standards (see figure 8).

Petroleum fuel prices in the U.S. do not include the full social costs their consumption, which are borne by society over time.

Petroleum fuel taxes in California are not sufficient to cover the costs of our transportation infrastructure.

CalSTEP recommends the following as smart strategies for ensuring innovation and progress in the clean transportation space:

- Implement strong greenhouse gas emission standards for light duty vehicles (LEV III GHG, also known as Pavley II). The U.S. Environmental Protection Agency (EPA) and CARB have been analyzing the feasibility and potential impacts of a program resulting in a 3-6% average annual reduction in greenhouse gas emissions.\(^\text{47}\) A target at the higher end of this range would drive innovation and investment in vehicle efficiency, as well as provide important consumer benefits. The standards should accurately reflect the potential benefits of alternative fuels. If properly designed and successfully imple-

### Consistent Vehicle and Fuel Standards

**Set and enforce strong and consistent vehicle and fuel standards to create a predictable business climate and accelerate innovation.**

Many of the state’s planned and existing regulations and standards could reduce petroleum dependence, increase fuel diversity, and make California a more energy secure state. CalSTEP recommends the following as smart strategies for ensuring innovation and progress in the clean transportation space:

- Implement strong greenhouse gas emission standards for light duty vehicles (LEV III GHG, also known as Pavley II). The U.S. Environmental Protection Agency (EPA) and CARB have been analyzing the feasibility and potential impacts of a program resulting in a 3-6% average annual reduction in greenhouse gas emissions.\(^\text{47}\) A target at the higher end of this range would drive innovation and investment in vehicle efficiency, as well as provide important consumer benefits. The standards should accurately reflect the potential benefits of alternative fuels. If properly designed and successfully imple-

mented, such a program has the potential to provide great improvements in fuel economy and increased use of alternative fuels.

- Continue implementation of the state’s Low Carbon Fuel Standard (LCFS). While the science underlying the characterization of lifecycle emissions has been controversial, we believe that the benefits of moving forward outweigh the risks. As part of the implementation process, California should continue refining the science behind the carbon intensities. This should include further investigation into the indirect costs and emissions associated with all transportation fuels, including conventional petroleum. Additionally, we recommend that California begin a process for evaluating a second phase of the LCFS. In so doing, California should (1) identify the degree to which carbon reductions from fuels are possible, and (2) set post-2020 targets accordingly.

CalSTEP believes that these standards for vehicles and fuels are important pieces of a comprehensive approach to curbing petroleum dependence. Though the vehicle and fuel standards discussed above focus on climate change mitigation and not explicitly on energy security, the issues are closely related and these policies have the potential to yield significant energy security benefits.

We note that the standards recommended above designed primarily to spur near term technologies that will yield incremental improvements. These do not eliminate the need for a next generation of vehicles and fuels, including advanced biofuels, alternative fuel hybrids, battery electric vehicles, hydrogen fuel cells, and related fueling infrastructure. The Zero Emission Vehicle (ZEV) program has opened the market for plug in and fuel cell vehicles over the past several years, providing critical support for small electric vehicle manufacturers. Some CalSTEP members noted that, if properly designed and successfully implemented, the ZEV program could continue to play a role in accelerating the development and marketability of these technologies. However, the group did not come to a consensus regarding the best ways to achieve these aims.

**Technology Incentives and Investment**

*Ensure adequate public funding for clean transportation and update program criteria to direct investments toward solutions that achieve multiple goals.*

California should ensure long-term public funding for clean transportation. There are many reasons why the state needs to make these kinds of investments over the next several years. First and foremost, conventional technologies requiring petroleum fuels are currently priced more cheaply than cleaner alternatives. Second, there are several transition barriers to dismantle as we move toward cleaner fuels. These include gaps in private financing for new technologies — so-called “valleys of death” — as well as high start-up costs, consumer acceptance issues, and a suite of existing conditions that favor conventional fuels.

The California Energy Commission estimates that $100 billion in total market investment will be needed by 2050 to transform California’s

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48 There are well-recognized financing gaps in the development and commercialization process for new technologies. Bridging these “valleys of death” is a challenge for all new technologies, and the problems are particularly great for clean energy and transportation, which often require large scale, capital intensive investments in unproven technologies. The first funding gap is a lack of capital for early stage research. This is an area that has traditionally been addressed through government support for research and development, but there is a general recognition that more funding is needed. New technologies face additional barriers when trying to move out of the lab and toward pilot scale production, and when trying to scale up to broad deployment and commercial scale. Private capital is not generally available for some of these high risk investments, and public support is needed. California has existing programs aimed at addressing these needs, but more investment is needed.
CALIFORNIA ACTION PLAN 2.0

CalSTEP Policy Recommendations

This will require substantial investment and commitment from both the public and private sectors. The recommendations included in this report can improve the business climate for private investment, thereby reducing (but not eliminating) the public sector’s share of the cost. For example, strong and consistent standards can help provide the certainty that private companies need to invest. Without this consistent regulatory framework, private investment will suffer. Additionally, the petroleum fuels fee outlined above would improve the business case for private investment by helping to narrow the cost gap between conventional technologies and clean alternatives. In the absence of such a fee, there will be a greater need for public investment in purchase incentives and grants to help level the playing field.

FIGURE 9:
CALIFORNIA CLEAN TRANSPORTATION FUNDING*

Given economic realities, California must maximize the impact of existing programs and think strategically about where to direct limited state dollars. The state and various regional agencies currently spend roughly $500-700 million per year on clean transportation technology incentive funding, through several different programs. Approximately $300 million of this is through fee-funded air quality and climate programs, while the Proposition 1B transportation bond provides the rest. Most of this funding goes toward technologies to improve air quality, resulting in missed opportunities for enhanced energy security and reduced greenhouse gas emissions. A large portion of the state’s current incentive funding for clean transportation is directed at diesel emission control technologies for the heavy duty sector. The CEC’s investments through the Alternative and Renewable Fuel and Vehicle Technology Program created under AB 118 (Núñez, 2007) are the exception, as they focus on technologies that reduce GHG emissions and displace petroleum.

As shown in figure 9, existing clean transportation investment programs (such as the Proposition 1B Goods Movement Emission Reduction Program and the multiple programs created by AB 118)

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50 This estimate is based on current and projected revenues and expenditures in several key incentive programs for advanced, low emission transportation technologies. The programs included in this estimate are: the Proposition 1B Goods Movement Emission Reduction and Lower Emission School Bus programs, the AB 118 Fleet Modernization Program managed by the Bureau of Automotive Repair, the AB 118 Alternative and Renewable Fuel and Vehicle Technology Program managed by the Energy Commission, the AB 118 Air Quality Improvement Program managed by the Air Resources Board, the Carl Moyer Program managed by the Air Resources Board, and the AB 923 Carl Moyer enhancement. Yearly incentive amounts for these programs are estimates based on discussions with program staff.
sunset over the next several years. Given the need for long term, sustained funding, California will need to “do more with less.” Given the magnitude of the challenges we face, CalSTEP recommends that California do the following:

- Direct public funding toward solutions that help California reach all of its related clean transportation goals. This would require the state to re-evaluate current investment strategies and legacy programs. The ultimate goal should be to establish new priorities and criteria that will improve the chances the state will meet the three goals of energy security, preventing climate change, and improving air quality. While CalSTEP believes that there is a general need to think more strategically about how to leverage limited state dollars to achieve multiple policy goals, this is a complicated and important issue that deserves thoughtful consideration, broad stakeholder engagement, and a willingness to consider new ideas.

- Maintain existing clean transportation incentive funding levels (roughly $500 to $700 million per year) as long as public investment is needed. Given the impending drop off in clean transportation funding, this will require new programs or extensions of existing programs. Identifying and securing additional financial resources is, admittedly, a huge challenge.

- Ensure adequate support for clean transportation technology research and development. AB118 and the Public Interest Energy Research (PIER) program provide some resources for this, but the state should consider additional support for these needs.

Some CalSTEP partners suggest that California consider partially funding clean transportation initiatives with the proposed petroleum fuels fee or the potential revenues generated from an auction of emissions allowances under AB 32.\footnote{Beginning in 2012, more than 40 million metric tons per year of upstream transportation sector petroleum production and refining GHG will be included in the California program. The transportation sector share is likely to reach about 200 million metric tons per year in 2015 when on-road transportation tailpipe emissions are included (based on CARB’s climate change inventory and projections, assuming that roughly half of the oil & natural production category can be attributed to transportation fuels and that moderate amounts of reductions occur in the transportation sector by 2015). Even if the majority of these resources are returned to citizens (as recommended by the Economic and Allocations Advisory Committee or EAAC, see chapter 6), there would still be a significant share remaining for other purposes such as clean tech (also recommended by EAAC) including advanced transportation technology and others. The exact value is somewhat uncertain with CARB seeking to set a $10/metric ton price floor.}

However, there is great uncertainty about the amount of potential revenue this represents, and there are also many competing interests for these funds. This issue will require creative thinking and stakeholder engagement.

Strategic and Sustainable Growth Funding

Align state transportation funding with strategic and sustainable growth goals; provide flexibility for local and regional authorities to raise revenues for smart growth projects.

In 2008, California passed Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008) which is designed to reduce per capita greenhouse gas emissions through regional land use and transportation strategies. Though SB 375 targets

Given economic realities, California must maximize the impact of existing programs and think strategically about where to direct limited state dollars.
greenhouse gases, its implementation is expected to reduce petroleum dependence and improve the efficiency of our transportation system. This is consistent with the Smart Communities Program recommended in CalSTEP’s 2007 Action Plan.

Passage of SB 375 was an important first step, but there are several outstanding barriers. Existing incentives and market rules at the local and regional level are automobile-centric, encouraging sprawl and increased petroleum dependence over infill, transit, and system-wide transportation efficiency. For example, parking and congestion mitigation requirements for new developments favor automobiles and do not typically provide credit or incentives for alternative modes of transportation. Similarly, existing state and regional transportation funds generally focus on road construction and capacity enhancement as opposed to smart growth initiatives such as planning, transit, and bike lanes. We must work to change incentives and provide funding at the local level in order to facilitate strategic and sustainable growth.

As noted above in the discussion of clean transportation technology funds, CalSTEP believes this is a good time to step back and examine California’s funding priorities. We must ensure adequate funding for our strategic and sustainable growth goals and must also make sure that we are getting the maximum return on our investments. To address these issues and begin transforming California’s land use patterns, CalSTEP recommends the following:

- Direct state and regional transportation funds to areas and projects that support strategic and sustainable growth patterns. By steering California’s limited dollars toward these projects, the state can support land use and growth decisions at the local level that will reduce oil dependence, cut harmful emissions, and meet citizens’ mobility needs through means other than the personal automobile. This requires greater coordination among state agencies and may also necessitate a set of performance targets or standards. The Strategic Growth Council offers a good starting point for increased coordination and smart investments (see “Encouraging Sustainable Practices and Growth Patterns at the Local Level” below). As with the transportation technology funding, it is clear that this is a sensitive topic that will require thoughtful engagement with all of the affected stakeholders.\footnote{Over time, such a change could lead to the increased use of Least-Cost Planning (also called Integrated Planning), an approach to resource planning that considers demand management solutions equally with strategies to increase capacity, and considers all significant impacts (costs and benefits), including non-market impacts. When applied to transportation planning it tends to shifts more planning and investment resources to smart growth, transit, and mobility management programs. This is similar to California’s approach to meeting electricity demand through integrated resource planning that focuses on efficiency and demand management as well as the construction of new power plants. Least Cost Planning has been required by Washington State law (RCW 47.80.030) for regional transportation plans since July 1, 1994. [online] http://apps.leg.wa.gov/rcw/default.aspx?cite=47.80.030}

- Provide greater authority for local and regional authorities to set fees, raise revenues, and finance smart growth projects. This could include local fees, tax increment financing, and public private partnerships. The petroleum
fuels fee is another possible revenue source. In order to drive change in this area, regional authorities will need multiple funding streams.

Full-Cost Transportation Pricing

*Move toward full-cost pricing for transportation in order to align market incentives with energy security goals and support cleaner transportation choices.*

Conventional transportation options are under-priced, with the full costs hidden from consumers. Free use of roads, free parking, flat rate auto insurance, and low fuel prices are all examples of this phenomenon. Thus consumers drive more than they otherwise might, passing the costs along to society in the form of poor air quality, road congestion, traffic accidents, and other negative health and environmental impacts. Moving toward user fees that more fully reflect the true costs of transportation choices offers two important benefits. First, variable and full-cost pricing for vehicle travel can reduce unnecessary trips and encourage transit use or carpooling. Second, user fees for transportation infrastructure can provide revenues for strategic and sustainable growth projects. The most important pricing policy—a petroleum fuels fee—is discussed above (see “Transportation Energy Security Fee and Reinvestment”). We recommend the following additional transportation pricing policy changes.

Encouraging Sustainable Practices and Growth Patterns at the Local Level

While the state does not control local land use, planning, parking and related decisions, there is an opportunity to encourage and support sustainable practices. This would leverage the efforts that regions and local governments will be putting into developing plans to reduce greenhouse gas emissions through land use and transportation per California statute (SB 375, Steinberg). Through education, outreach, and realignment of funding priorities, California can encourage local and regional authorities to embrace strategic and sustainable growth. In time, we can expect to see changes that support infill, transit oriented development, and increased use of alternative modes such as transit, vanpools, bicycling, and walking.

One promising avenue for greater coordination and progress is the Strategic Growth Council, a cabinet-level committee composed of agency secretaries from Business, Transportation and Housing; California Health and Human Services; California Environmental Protection Agency; the California Natural Resources Agency; the director of the Governor’s Office of Planning and Research and a public member appointed by the Governor. The Strategic Growth Council coordinates the work of state agencies to protect the environment and public health, increase the availability of affordable housing, improve infrastructure, and assist state and local entities planning sustainable communities and meeting AB 32 goals. The Strategic Growth Council also awards grant funds from Proposition 84, which can be leveraged to maximize VMT reductions, and undertakes outreach to local and regional governments. 53

53 For more information on the Strategic Growth Council, see: [http://www.sgc.ca.gov/about_us.html](http://www.sgc.ca.gov/about_us.html)
Grant local and regional authorities the ability to implement congestion pricing. Congestion pricing can reduce traffic, increase system-wide efficiency, and encourage carpooling and transit usage, thereby reducing petroleum use. Additionally, revenues from congestion pricing can finance local planning and smart mobility initiatives.

Encourage local and regional authorities to re-examine parking policies that reinforce California's petroleum dependence. By reducing minimum parking requirements and removing parking subsidies, California could encourage mixed-use developments, carpooling, and increased transit usage. One primary way to encourage parking strategies that will help achieve energy security goals is through changes in funding formulas and priorities, as outlined above. Technical assistance and outreach could also play a role.

Monitor progress on Pay as You Drive (PAYD) insurance policies in California. Consider changes to current PAYD regulations if they do not lead to PAYD insurance products with a strong impact on consumer decisions, petroleum usage, and transportation-related pollution. Potential policy changes include requiring insurers to offer some PAYD product or providing additional guidance on how these products should be structured and how premiums should track miles traveled. The effort to encourage PAYD insurance should also include an outreach and education component — see below.

Outreach and Education

**Educate key stakeholders and the public to support strategic and sustainable vehicle, fuel, and growth policies.**

Public education and outreach efforts must support the transition toward cleaner vehicles, fuels, and transportation choices. Effective outreach can influence decision-making and help consumers save money through smarter decisions. General education and outreach efforts should target vehicle and fuel technologies as well as transit and mobility options. In addition, the following are vital outreach and education priorities for our state:

- Teach people how to cut fuel consumption and save money through improved driving techniques (i.e. slower acceleration, smoother driving) and better vehicle maintenance. Researchers reviewed several programs and determined that “eco-driving” can reduce fuel consumption and cut greenhouse gas emissions by 10% in the near term and 3-5% in the mid-term. These vehicle maintenance and driving techniques could be integrated into education required for licensing. For existing licensed drivers, traffic school could cover these topics.

- Educate consumers on various PAYD insurance policies. This could be done through an Energy Star-style labeling program highlighting projected cost savings and environmental benefits, or through an annual report card from the Department of Insurance rating policies that best reward customers for reductions in mileage. These should improve the efficiency

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of the auto insurance market, providing better information for consumers. This should increase market demand for PAYD policies that curb petroleum use and transportation-related emissions.

- Consider crafting a state certification for projects or neighborhoods that meet strategic and sustainable growth standards. Much as LEED certification transformed the building industry, a statewide “sustainable community” grading system can help transform how local governments set priorities and meet the goals set out by SB 375. This could highlight the benefits of sustainable growth to residents, developers, and other regions. Particularly if tied to transportation funding, this certification could be a powerful motivator. The Caltrans Smart

**Existing Outreach and Education Efforts Around the World**

**Eco-driving programs** are in place in Canada, Germany, the Netherlands, and Sweden. Experience with existing programs suggests they improve the efficiency of on-road vehicles. A 2007 symposium on eco-driving for greenhouse gas mitigation found that communication campaigns to promote these practices have worked, particularly when they are promoted as a “brand” with messaging that borrows insights from commercial marketing. This may be more effective in partnership with automobile clubs, industry groups, and consumer organizations. Presentations at the symposium also suggested that incorporating ecodriving into driver’s education programs can yield significant fuel and emissions savings.55

**Certification efforts for green communities** are underway around the country. The national LEED for Neighborhood Development Rating System launched in 2009 to provide third-party verification that a development’s location and design meet or exceed environmentally responsible, sustainable development standards. To complement LEED certification, Transform has developed ‘GreenTRIP’ certification to promote infill projects with comprehensive traffic and emissions reduction strategies.56 ICLEI-Local Governments for Sustainability (ICLEI), the U.S. Green Building Council (USGBC), and the Center for American Progress (CAP) are developing the STAR Community Index, a national, consensus-based method for gauging the sustainability and livability of U.S. communities. STAR will be launched in 2011.57

**A Pay As You Drive (PAYD) insurance labeling effort** has been proposed. A coalition of environmental and transportation groups, led by NRDC and Ceres, released a PAYD Standard to serve as guidance to policymakers, regulators, insurers and even consumers looking to evaluate or promote PAYD policies. Although the PAYD idea has been around for decades, there is really no consensus definition for it. This creates confusion and exacerbates miscommunication. This standard is an effort to nail down what the stakeholders would consider “real” PAYD, with regards to environmental performance and consumer savings.

Mobility Framework offers a potential model.58

- Educate public agencies on the value of alternative transportation strategies. Conventional transport planning tends to focus on a limited set of objectives and thus undervalues transportation demand management. For example, conventional planning often focuses on motor vehicle congestion, vehicle operating costs and accident rates, but ignores delays to pedestrians and cyclists, vehicle ownership costs, and physical fitness and public health needs. Smarter planning that incorporates transportation demand management strategies can reduce the need to expand roads and parking facilities, while also reducing traffic accidents, boosting energy conservation, and improving mobility for non-drivers.

State Leadership

Implement a State Fleet and Facilities Leadership plan to set an example, reduce emissions from state fleets, and support markets for clean vehicles and fuels.

By reducing petroleum usage in the state fleet, California can lead by example while helping to create early markets for advanced technologies. AB 236 (Lieu, 2007) required the state to reduce petroleum usage from our fleet, calling for a 20% reduction from 2003 levels. However, progress has been slow and it is not yet clear how the state will meet these goals. The first report on the implementation of AB 236 lists possible actions,59 but without naming the petroleum reductions that each might provide. State leadership by example is a key way to drive change in the transportation sector; this can be demonstrated as follows:

- The Department of General Services (DGS) should develop and implement a plan with clear steps and timelines for meeting the goals set out by AB 236. This should include a purchase schedule for the state fleet and facilities that will yield the required petroleum reductions. DGS should track progress against this plan and regularly updated the Governor and Legislature on implementation. DGS could also consider opportunities to support the market for advanced technologies through targeted bulk purchases or public-private partnerships.

- Explore using state-owned parking structures to encourage the use of clean vehicles. By providing free or preferential parking for alternative fueled vehicles, the state could provide a valuable incentive for consumers to purchase them.

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58 One relevant effort that is currently underway is the Caltrans Smart Mobility Framework. The goal of this effort is to develop a planning framework that will be used to guide development of products as well as assess how well products meet “smart mobility” principles and criteria. This framework could potentially be applied to various levels of plans, programs, or projects (e.g., Regional Transportation and Blueprint Plans, General Plans, corridor plans, specific development proposals, etc.) in all parts of the state. For more information, please see: http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html

CONCLUSION
WE CAN REDUCE PETROLEUM USE AND REAP MULTIPLE BENEFITS FOR CALIFORNIA

California’s dependence on petroleum creates serious risks for our economy and environment. The business as usual path is not sustainable. Acting now to reduce petroleum dependence, increase energy security, and achieve a cleaner transportation future offers multiple economic, health and environmental benefits for us all. These include improved air quality, reduced global warming pollution, and more sustainable growth patterns. Additionally, moving toward a clean and secure transportation future promises new opportunities for economic development and job growth for Californians as we replace imported petroleum with cleaner, more labor-intensive, and California-made alternatives.

Achieving these goals will require a proactive approach and comprehensive package of policies that includes clear targets, strong standards, public investment, pricing strategies, and education efforts. These policies are complementary and will not achieve their goals if implemented in a vacuum. Most important of all, California must move forward in a way that creates a stable regulatory environment that provides certainty for consumers, businesses, and investors. The recommendations outlined above are essential elements of a comprehensive strategy to secure California’s energy future.

California’s rapidly increasing reliance on foreign oil underscores the urgency of the transportation energy security challenge. Unfortunately, there has been little progress on this issue at the federal level. As has been the case with air quality and climate change, states and regions must step up to take action. California should build on its history of leadership by acting now to address the transportation energy security challenge.

Acting now to reduce petroleum dependence, increase energy security, and achieve a cleaner transportation future offers multiple economic, health and environmental benefits for us all.