



Caltrans Division of Research,
Innovation and System Information

Research

Notes

Planning
Policy
Programming

NOVEMBER 2015

Project Title:
STEPS3 2015-2018: Understanding
Critical Transition Dynamics for
Sustainable Transportation

Task Number: 2858

Start Date: December 1, 2015

Completion Date: December 31, 2018

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STEPS3

Understanding the critical transition dynamics for sustainable transportation, and disseminating that knowledge to decision-makers to assist them in making informed technology, investment, and policy choices.

WHAT IS THE NEED?

Technological innovations are transforming the energy and vehicle industries—conventional vehicles are becoming far more energy efficient and have the potential for even more efficiency gains. The net effect of these developments undermines the demand for alternative transportation fuels and vehicles. However, many studies conclude that market penetration of alternatives must be accelerated as part of a suite of mitigation options in order to stabilize the climate. Even with technical advances and early commercial activity in electric vehicles, natural gas, hydrogen, and advanced biofuels, none of these alternatives have reached mass-market scale. Successful, early transitions are critical for low-carbon transportation, but are challenging and poorly understood.

The STEPS (Sustainable Transportation Energy Pathways) and NextSTEPS public-private, 4-year sponsorship programs developed the theory, tools, and methods that allowed for transparent comparisons of promising alternative energy and vehicle pathways, and addressed the implications of transitioning to an alternative fuels future. While these analyses were important steps for Caltrans in the understanding of alternative fuels and how they might be implemented, there is still the need to address how these comparisons could assist Caltrans in sustainable transportation planning and policy development.

The current 4-year STEPS3 program will refine scenarios and better characterize the critical factors for successful sustainable transportation transitions. STEPS3 will continue to explore the difficult technical, economic, and behavioral questions required to inform industry planning and government policy. Caltrans needs to have this information to understand the impacts on California's plans for a sustainable future and the implications of moving to an alternative fuels future.



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California's transportation system

WHAT ARE WE DOING?

At the beginning of each year of the program, STEPS3 researchers will coordinate a personalized conversation with key contacts at Caltrans to match Caltrans' specific needs to STEPS3 projects, to prioritize and schedule 1-on-1 and small group meetings with STEPS3 researchers, and to organize an efficient process for transferring information to Caltrans' customer contacts. In addition to the dissemination of information to Caltrans, the STEPS3 team will issue quarterly reports to all sponsors on the progress of the program. Participating sponsors have the advantage of becoming familiar with preliminary and final research results 6 to 18 months prior to publication or formal public talks.

Each year, STEPS3 researchers will host at least three webinars on topics of pressing interest to sponsors, and will host two invitation-only workshops for sponsors. These workshops provide high-level policy and technology discussions, as well as review of research outputs from the STEPS3 program. The gathering of highly-informed consortium members allows for valuable discussion and technical exchange. These events are exclusively for sponsors, invited technical experts, and senior government and public interest organization leaders.

As a sponsor, Caltrans is allocated a seat on the program's Advisory Board, which meets once per year to provide input on STEPS3 studies, research direction, and public outreach directions. A cumulative summary of the year's research is issued at the end of each fiscal year and distributed to all sponsors.

WHAT IS OUR GOAL?

The goal of the STEPS3 program is to inform the public debate and to assist its public and private sponsors by providing tools and knowledge concerning sustainable transportation alternatives. STEPS3 seeks answers to critical research questions through four new themes: 1) Initiating Transitions 2015-2030: What is required for early alternative fuel and vehicle transitions to succeed?; 2) The Future of Fuels and the Oil and Gas Industry: How will changing geopolitical landscapes and disruptive technologies in the oil, gas, and clean technology industries impact future

business models and the competition of fuels?; 3) Global Urban Sustainable Transport (GUSTo): How will a rapidly urbanizing world affect demand for transport and energy? How can we transition to sustainable transportation in a rapidly urbanizing world with ever-growing need for mobility?; and 4) Modeling Analysis, Verification, Regulatory and International Comparisons (MAVRIC): What do improved and cross-compared economic/environmental/transportation/energy models tell us about the future of sustainable transportation?

For Caltrans, this means having a full research portfolio of the major alternative fuel types, which includes fuel use development and the potential impacts and challenges to public sector entities and policy-makers. The reports and documents produced by the researchers will help Caltrans decision-makers obtain a greater understanding of how these fuels could change the sustainable transportation landscape in the future for both the Department and society at large.

WHAT IS THE BENEFIT?

The STEPS3 program is one of Caltrans' most visible examples of direct involvement within a private-public funded collaboration program. Through the collaborative sponsorship effort that includes numerous researchers studying a variety of alternative fuel use scenarios, Caltrans is able to obtain a great volume of data and analyses (at a much reduced cost than if the Department were to study each of the fuel types separately) with which to evaluate the implications of alternative fuel use and to provide this information to Caltrans' planners and decision-makers. Also, as STEPS3 researchers study a particular alternative fuel transition issue, that knowledge can assist Caltrans with its own internal studies on like-issues and/or reduces duplication of research efforts, thereby saving additional costs.

WHAT IS THE PROGRESS TO DATE?

As of November 2015, the contract package is being processed by Caltrans Division of Procurement and Contracting.