Program Progress Performance Report
for University Transportation Centers

Submitted to: U.S. Department of Transportation, Office of the Assistant Secretary for Research and Technology

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ACCOMPLISHMENTS

What are the major goals of the program?

The National Center for Sustainable Transportation (NCST) is led by the University of California, Davis (UC Davis) and brings together the expertise of its consortium members: Georgia Institute of Technology; University of Southern California with California State University, Long Beach (METRANS); University of California, Riverside; and University of Vermont.

The goal of the NCST is to transform the transportation system to improve environmental sustainability nationwide. We aim to provide leadership that produces meaningful action and outcomes by mobilizing innovative and accomplished research teams and partnering with influential individuals and stakeholder groups. To provide this leadership, we will build upon the well-established and highly influential transportation centers in our consortium to develop a self-supporting center that will launch influential research and education programs fully integrated with an aggressive program of engagement.

The NCST will:

• mobilize a network of universities to generate knowledge and tools that address climate change and environmental sustainability in transportation;
• design and evaluate real-world strategies that contribute to mitigation of GHG emissions and other environmental impacts; and
• deliver knowledge and tools to state DOTs, Metropolitan Planning Organization (MPOs), and local governments to support implementation of these real-world strategies.

What was accomplished under these goals?

The NCST has completed the following administrative tasks and research, engagement, and education activities to implement our goals during the reporting period of September 30, 2013 to March 31, 2014:

Administrative Tasks:

1) Completed subaward negotiations for subcontracts with consortium members.
2) Negotiated commitments of matching funds from state agencies (Caltrans, California Air Resources Board, California Energy Commission, South Coast Air Quality Management District).
3) Completed task orders, project schedules and budgets for Research-In-Action Groups and Policy Forums for Caltrans
4) Held meetings of the NCST’s Leadership Council in November and January.
5) Hosted teleconference with the Executive Committee in March.
6) Hired Program Manager in March.

Research Activities:

1) Selected “jump-start projects” at METRANS, UC Riverside, Georgia Tech, and University of Vermont.

2) Released a Call for Proposals for projects within the four research themes of the NCST for UC Davis researchers, and completed review of Letters of Intent.

3) Completed development of guidelines for the White Papers and released request for descriptions, outlines, timelines and budgets with the expectation that most white papers will be completed by the end of the summer.

4) Initiated discussions with the California Air Resources Board (ARB) to develop the scope of work and detailed proposals for three projects to be funded through their commitment of match funding ($1 million):
   - The Dynamics of Plug-In Electric Vehicles in the Secondary Market and Their Implications for Vehicle Demand, Durability, and Emissions ($300,000)
   - The Development of Lifecycle Data for Hydrogen Fuel Production and Delivery ($250,000 – joint project with UC Riverside ($125,000)
   - Potential to Build Current Natural Gas Infrastructure to Accommodate the Future Conversion to Near-Zero Transportation Technology ($250,000 – joint project with UC Riverside ($62,500)

5) Developed and submitted a proposal to the California Energy Commission for $1.1 million to undertake a study of Emerging Technologies. This project will accelerate the transition toward zero-emission vehicle and low-carbon fuel technologies for both passenger transportation and goods movement through research on the commercial barriers that are inhibiting the adoption of promising innovative alternative and renewable vehicle and fuel technologies and the strategies and policies to overcome those barriers. The project will be a collaborative effort between UC Davis, UC Riverside, and METRANS researchers. CEC has approved the funding for this study.

6) Completed process to obtain Institutional Review Board consent to deploy the Commute Warrior Android App this coming summer. Commute Warrior is now on the Google Play store and will be initially deployed to a sample of 200 households. (Georgia Tech – Project: Innovative Data Collection to Improve Transit Service Assessment)

7) Began development of work plans for two projects to be lead by the University of Vermont (exact titles may change):
   - Integrating Traffic Simulation Models and Project Level MOVES
   - Eco-driving

8) USC/METRANS submitted task orders to Caltrans for the following projects (and their white paper on the effectiveness of land use and demand strategies in reducing
vehicle-miles-traveled and greenhouse gas emissions (passenger vehicles):

- Impact of Legislative Mandates on Transportation Workforce Capacity
- Urban Spatial Structure and GHG Emissions (aka Refocusing on Work Locations to Reduce GHGs)
- Spatial dynamics of the logistics industry and implications for freight flows (aka Strategies for Reducing Urban Freight VMT)

**Engagement Activities:**

1) Completed a four-session forum series on Sustainable Communities, in conjunction with the Policy Institute for Energy, Environment, and the Economy (January – March 2014):
   - Session 1: Sustainable Communities 101
   - Session 2: Evaluating Effects and Evidence
   - Session 3: Improving the Models
   - Session 4: Increasing Implementation Follow-Through

2) Hosted a weekly seminar series at UC Davis, available online for students at other consortium institutions. Speakers are invited from government, industry, public interest groups, consortium institutions, and other academic institutions. Seminars included the following:
   - High-Speed Rail: Engineering the Future (Jeff Morales, Chief Executive Officer, California High-Speed Rail Authority)
   - The Why, How and What of Livable Streets from Policy to Implementation (Bryan D. Jones, Deputy Director, Transportation Department, City of Carlsbad)
   - Truth in Data. Use in Data. Faith in Analysts (Elizabeth Sall, Deputy Director for Technology Services, San Francisco County Transportation Authority)
   - Autonomous Vehicles: Anticipating Impacts in a World of Increasingly Shared Mobility (Dr. Kara Kockelman, Professor & William J. Murray Jr. Fellow, Department of Civil, Architectural & Environmental Engineering, The University of Texas at Austin)
   - Launching an Automated Active Transportation Data Collection System in San Diego, CA (Dr. Sherry Ryan, Professor, School of Public Affairs - Graduate Program in City Planning, San Diego State University)
   - Electric-Drive-Vehicle Research at the UCLA Luskin Center for Innovation (Dr. Brett Williams, Electric Vehicles & Alternative Fuels Program Director, UCLA Luskin Center for Innovation / Assistant Adjunct Professor of Public Policy)
   - The Tea Party, Property Rights, and Mega Planning in a Digital Era (Dr. Karen Trapenberg Frick, Assistant Director of the University of California Transportation Center/ Lecturer, Department of City and Regional Planning at UC Berkeley)
   - TRB Preview (poster sessions and podium presentations by 6 graduate students)
• Development of Hybrid Choice Model to Investigate Effects of Teenagers’ Attitudes Toward Walking and Cycling on Mode Choice Behavior - winner of the 2013 TRB Ryuichi Kitamura Paper Award (Maria Kamargianni, PhD Candidate, Travel Demand Modeler, University of the Aegean, co-author of the winning paper of the TRB Kitamura award)
• Robocar/taxi: Utopia or Dystopia? (Steve Raney, Principal, CITIES21, a smart mobility consultancy, Palo Alto, CA)
• Evolving Transportation Networks (David M. Levinson, Professor, Department of Civil Engineering, Richard P. Braun/CTS Chair in Transportation Engineering, University of Minnesota)
• One Size Does Not Fit All: The Challenges of and Capabilities Needed for Sustainable Innovation (Andy Hargadon, Professor, Technology Management, Charles J. Soderquist Chair in Entrepreneurship, Graduate School of Management, UC Davis)
• The Economics of Walking and Bicycling Facilities: Why We Need to Spend More Now (John Lieswyn, Associate, Alta Planning + Design)
• Understanding Household Preferences for Alternative Fuel Vehicle Technologies (Hilary Nixon, Associate Professor, Associate Chair and Graduate Adviser, Department of Urban & Regional Planning, San Jose State University)
• The Future of Transportation Finance (Martin Wachs, Professor Emeritus, Civil & Environmental Engineering and City & Regional Planning, UC Berkeley; Director, Transportation, Space, & Technology Program, RAND Corporation)

3) Developed and submitted work plans for Research-in-Action Groups and Policy Forums to Caltrans.

4) Initiated discussions with Caltrans to develop and host two workshops on Sustainable Transportation (one for their Sustainability Committee and one for the Caltrans Executive Committee). We are collaborating with UCDavis Extension (http://www.extension.ucdavis.edu) for these workshops.

5) Initiated discussions with the California Air Resources Board (ARB) to undertake a three-day training event regarding Sustainable Freight. UC Davis will collaborate with CSULB on this training.

6) Initiated discussions with the ARB to undertake two all-day Engagement Sessions (one in Northern California, one in Southern California) on the topic of Sustainable Freight.

7) UC Riverside recently completed a major international conference on Portable Emission Measurement Systems (PEMS), partially supported by NCST. By developing better methods of quantifying energy and emissions from vehicles, it will allow for better analyses of advanced transportation programs and projects supported by NCST.

**Education Activities:**

1) Completed search for post-doctoral scholar working in the area of new mobility and
travel demand at UC Davis; position will commence June 1.

2) Began work on development of the Model Curriculum for Sustainable Transportation (Georgia Tech). Specifically, we have begun developing courses that will teach sustainable transportation techniques to a wide audience of students, researchers, and practitioners. Discussions in the early spring among NCST member schools and others in the academic community resulted in a comprehensive assessment of existing courses and programs throughout the United States.

How have the results been disseminated?

Research activities for the National Center have not yet produced results, but the engagement activities listed above served to disseminate prior research from the consortium members.

What do you plan to do during the next reporting period to accomplish the goals?

Research Activities:
Researchers at each of the consortium universities will begin work on the proposed white papers.

UC Davis will receive proposals for projects to be funded by the research portion of US DOT funds and Caltrans funding. Proposals will be selected through a process of external peer review and internal selection. At least some of the projects selected will begin within the next reporting period.

The CEC Emerging Technologies project is expected to kick off in June 2015.

Georgia Tech will continue work on the following projects, in addition to work on the model curriculum:

- Strategies for Reducing Emissions from Heavy Duty Vehicles – Online GHG Calculator for Heavy-Duty Vehicles
- Improved Emissions Models for Project Evaluation
- Eco-Driving for Transit Vehicles
- Using Technology to Expand Mobility Options – Innovative Data Collection to Improve Transit Service Assessment

The University of Vermont will finalize the work plans for the two projects mentioned above and have them reviewed internally as well as by external advisors, before finalizing details and beginning the research.

METRANS will begin work on their Caltrans funded projects, pending agreements being established following submission of their task orders:

- Impact of Legislative Mandates on Transportation Workforce Capacity
- Urban Spatial Structure and GHG Emissions
(aka Refocusing on Work Locations to Reduce GHGs)

- Spatial dynamics of the logistics industry and implications for freight flows
  (aka Strategies for Reducing Urban Freight VMT)

UC Riverside will finalize task orders for their projects selected for Caltrans funding in order to be able to begin those projects. UC Riverside will also begin work on the CEC Emerging Technologies Project to be lead by UC Davis.

UC Riverside is also conducting several jump start projects in different areas, sponsored by Caltrans, ARB, and CEC. The projects include Connected Eco-Technology for Freight Vehicles, Developing a Generalized Methodology for Establishing CO2 Off-Cycle Credits as part of Light-Duty Vehicle Greenhouse Gas Emission Standards, and the CEC Emerging Technologies project.

**Engagement Activities:**
The first Caltrans Sustainable Transportation Workshop (for the Sustainability Committee) is expected to take place in June 2015, and a second one (for the Executive Committee) is expected to follow.

Work associated with the Research-in-Action Groups to be funded primarily by Caltrans is expected to begin in June. Work associated with the Policy Forums is expected to begin in July.

The ARB Training and Engagement Sessions mentioned above are planned for the early summer.

Weekly seminars will continue, including the following:

- Impact of Streamlined Chassis Movements on Port Terminal Capacity (Dr. Tom O’Brien, Director of Research, Center for International Trade and Transportation; Associate Director, METRANS Transportation Center; California State University, Long Beach)
- Thoughts on Future Directions for Pavement in Modern Transportation Systems (John Harvey, Professor, Civil and Environmental Engineering; Chair, Transportation Technology and Policy Graduate Group; Principal Investigator, UC Pavement Research Center, University of California, Davis)
- Can You Spare a Dime? Advances in Transportation Pricing Technologies and Policies (David Dick, Senior Payment Systems Manager, CH2M HILL)

**Education Activities:**
Georgia Tech will continue work on the model curriculum. The comprehensive assessment of existing sustainability courses and programs will be distributed to the NCST participants to accompany an open discussion to be held in May 2014. This discussion will subsequently inform the design and content of the courses.
This summer we will offer graduate students UC Davis and UC Riverside the opportunity to spend a portion of the summer at the other institution working with faculty and graduate students on selected projects. The purpose of this exchange is to build collaborations between the campus and to give students exposure to new research methods and approaches.

**PRODUCTS**

All research is on-going; there are not yet any specific products from Center-funded projects.

As mentioned previously, Georgia Tech has made the *Commute Warrior* Android App available on the Google Play store – a product being deployed for the first time this summer, as part of the NCST project “Using Technology to Expand Mobility Options – Innovative Data Collection to Improve Transit Service Assessment”.

**Website(s) or other Internet site(s)**

A basic form of the NCST website has been hosted at [http://www.its.ucdavis.edu/research/affiliate-programs/national-center-for-sustainable-transportation/](http://www.its.ucdavis.edu/research/affiliate-programs/national-center-for-sustainable-transportation/). We are transitioning to a dedicated website at [http://ncst.ucdavis.edu](http://ncst.ucdavis.edu) and expect it to go live no later than May 1, 2014.

We will continue development of the NCST website and other communication tools.

**PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**

Our key partners are the members of our consortium from the University of California at Riverside, University of Southern California, California State University Long Beach, Georgia Institute of Technology, and the University of Vermont.

Funding partners include:

- United States Department of Transportation
- California Department of Transportation (Caltrans)
- California Air Resources Board
- California Energy Commission
- South Coast Air Quality Management District
- Georgia DOT is providing matching funds for selected research projects
UC Davis collaborates with researchers at the Institute of Transportation Studies, the Plug-In Hybrid and Electric Vehicle Research Center, the Sustainable Transportation Energy Pathways program, the Urban Land Use and Transportation Center, and the Policy Institute or Energy, Environment, and the Economy.

**IMPACT**

*What is the impact of the program? How has it contributed to transportation education, research, and technology transfer?*

The National Center for Sustainable Transportation has been referenced on several occasions in the media, focusing the attention of a potentially unlimited audience on the importance of working toward sustainable transportation systems. Some examples of media coverage include:

**State energy grants include $1.1 million to UCD for sustainable transportation center**

The California Energy Commission’s latest round of funding grants approved this week includes $1.1 million to the University of California, Davis, to establish a National Center for Sustainable Transportation.

The city of Davis received a $200,000 grant to develop a plan for additional plug-in electric charging stations for environmentally friendly vehicles.

Another $1.1 million grant went to the Atlanta-based Center for Transportation and the Environment to develop and deploy fuel cell hybrid electric, walk-in delivery vans. Nonprofit CTE also has an office in Berkeley.

The latest round of grants totaled $3.8 million. The CEC this week also approved two major, long-term investment plans that it said could total nearly a half-billion dollars. One will fund clean energy research that benefits electricity ratepayers. Another is an annual clean transportation investment plan designed to spark innovation in projects that will help transform California’s transportation fleet to meet greenhouse gas and clean air goals.

**Energy Commission grants include $1.1M to UC Davis for transportation center**

The California Energy Commission in Sacramento on Tuesday approved funding of more than $3.8 million in grants.
One of the largest grants, at $1.1 million, went to the University of California at Davis, to create a National Center for Sustainable Transportation.

The city of Davis got a $200,000 grant to create a plan for additional plug-in electric vehicle charging stations.

Another grant of $1.1 million went to the Center for Transportation and the Environment in Atlanta to expand fuel cell hybrid electric walk-in delivery vans. Other grants included $300,000 grant to the San Diego Association of Governments to create an Alternative Fuel Readiness Plan; $300,000 grant to the Los Angeles Department of Water and Power for a compressed natural gas fueling station; $300,000 to the Monterey Bay Unified Air Pollution Control District for an Alternative Fuel Readiness Plan; $299,910 grant to Santa Barbara County to develop an Alternative Fuels Readiness Plan; and $275,810 to the City/County Association of Governments of San Mateo County for an Alternative Fuel Readiness Plan.

What is the impact on the development of the principal discipline(s) of the program?

Increased focus on sustainability, greenhouse gas reduction, low-carbon infrastructure, efficient transportation system operation, low-impact travel, sustainable land use, zero-emission vehicles and fuels, and related institutional change across the United States. Increased collaboration between the NCST partner universities. Increased emphasis on educational materials related to these topics, and sharing of educational and workforce development resources.

What is the impact on other disciplines?

Interdisciplinary collaboration in research projects, education, workforce development and technology transfer. Collaboration between transportation researchers at the partner universities is likely to increase broader collaboration between the universities involved.

What is the impact on transportation workforce development?

Workshops, training sessions, research-in-action groups, and engagement sessions are being developed to engage the transportation workforce at many different levels.

What is the impact on physical, institutional, and information resources at the university or other partner institutions?

Increased emphasis and awareness of the importance and breadth of transportation at all partner institutions, as well as other collaborating institutions in the region and nationwide. As projects get underway, the availability of various products and reports on our website and distribution through social media will enhance the flow of information.
What is the impact on technology transfer?

Workshops, training sessions, research-in-action groups, and engagement sessions are being developed as mentioned in earlier sections, and regular seminars are ongoing.

What is the impact on society beyond science and technology?

Greater collaboration between academic institutions and development and implementation of paths from research to technology transfer.

CHANGES/PROBLEMS

There is nothing to report in terms of any changes or problems.

SPECIAL REPORTING REQUIREMENTS

There is nothing to report in terms of special reporting requirements.