

Training California's Workforce for 21st Century Transportation Vehicles and ITS Infrastructure

Executive Summary

Prepared for

**Advanced Transportation Technologies and Energy
Initiative
Economic And Workforce Development Program
California Community Colleges**

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Autumn 2005

Training California's Transportation Workforce for the 21st Century: Responding to the Intelligent Transportation Systems and New Vehicle Technology Revolution

Executive Summary

“For the overwhelming preponderance of human history, humans have lived in societies that were characterized by 80% continuities, 15% cycles, and only 5% novelties at best. Now I believe the figures are reversed: 80% of our futures may be novel, 15% cyclical and only 5% continuous with the past and present.” Professor Jim Dator, Hawaii Center for Futures Studies

The Challenge

The Chancellor's Office created the Advanced Transportation Technology Initiative:

“as a means for keeping California competitive as a national leader in advanced transportation technologies. The Advanced Transportation Technology Initiative (ATTi) was established to transform the workforce in the rapidly developing, technology-driven transportation industry while improving the environment and stimulating the economy.”¹

In fulfilling this role, the California Community College's Advanced Transportation Technology Initiative is facing a new education/training challenge, one that is well characterized by Professor Dator above. This challenge is created and driven by a continuing revolution centered on the swiftly expanding application of information technology to vehicles and to the transportation infrastructure. In turn, this is generating a dramatically new vehicle and transportation system operational dynamic.

Currently, California commerce and industry are faced with costly inefficiencies like congestion, slow goods movement, soaring fuel costs, rapid technology change, and increasing controls to address air pollution. These inefficiencies substantially limit the ability of industry to meet the requirement of global competition, which depends on a well organized, “intelligent” and competitive transportation system. In contrast Intelligent Transportation Systems (ITS) may be able to improve California's transportation system, accommodating as much as 40% of California's anticipated traffic growth, while increasing the volume of goods being moved and overall system and vehicle safety.

Such changes will also produce a substantial increase in the demand for training. Time Structures estimates that the potential need for training in ITS related fields will grow from 660,000 workers in 2005, to 766,000 in 2008, to 905,000 in 2010, and to over 1 million in 2015. Clearly the ITS revolution will cause ATTi to accelerate its innovative mix of new services, widen to whom it offers its services, and continue its tracking of how its services can be cost-effectively delivered.

Drivers and Constraints on Developing California's Intelligent Transportation System

Specification of the drivers and constraints that are likely to shape ITS' development in California provides a future oriented vision and context for ATTi's organizational development and curriculum planning efforts. Such a context should increase the Initiative's sensitivity, efficiency and responsiveness by forecasting broad business, market, and government ITS trends as they are about to emerge. The listed points summarize the Time Structures literature and survey results.

A number of social, environmental and economic drivers and constraints identified by the public and private sector are shaping the drivers and constraints associated with California's ITS transportation system.* These include:

- Limited federal and state government funds to improve the physical and ITS aspects of the transportation and goods movement infrastructure;
- Government regulation mandating specific fuels and possibly various ITS related technologies;
- Federal, state, and local standards and requirements for building an integrated, cross-communicating ITS infrastructure;
- Rate of market developments involving private sector innovations purchased and installed in private vehicles that link in some way to an emerging public or private ITS infrastructure;
- The response of public and private fleet management activities to better coordinate and improve the productivity and efficiency of public transit, fleet management, and goods movement; and
- Rate of development and adoption of advanced logistics systems (outsourcing and in-sourcing) using scanners, Radio Frequency Identification Technology (RFID) tags, information technology, Geographic Information Systems (GIS), Geographic Positioning Systems (GPS), and various communications modalities that are imbedded in or use ITS.

These drivers and constraints come together to produce the piece-meal, even chaotic emergence of California's new and complex transportation and movement economy.

Actions for Making ATTi Visionary, Evolving, and Agile

Analysis of the drivers and constraints produced a set of options that will enable ATTi to continue to track, agilely respond to and evolve with ITS' emerging developments. The goal is to continue to maintain and widen ATTi's competitive advantage, and that of its workforce and business clients, in this new training marketplace with as little expenditure or wastage of resources as possible.

The following actions for addressing emerging opportunities and constraints should be considered:

* Three volumes of research—literature review, business/government survey, and college administrator survey support this research summary and are available from the ATTi Director, Peter Davis, at: outrchpd@adnc.com

- Action 1:* Initiate leadership and technical ITS education programs for frontline technology decision-makers, such as fleet managers and administrators, and for frontline technology users, such as vehicle drivers and technicians.
- ATTi leadership development goes beyond technical expertise. The future will be highly complex and varied. ATTi leadership needs to imitate large corporations as they change by training their leadership to be flexible and capable of taking calculated risks that align well with the complex way the future is approaching.
 - Foster the continued development of key ATTi Initiative and Project leadership competencies consistent with the challenges of transportation systems.
 - Develop the capacity to anticipate and track ITS developments by systematically collecting ITS related data and by expanding participation in key government and private industry based planning groups. The goal of this activity is to track a highly complex, evolving system that is not fully here yet.
 - Continue to establish the proper mix of slow and rapid change that includes strategic realignment with the past combined with an adaptive orientation towards the future.
 - Continue to implement creative, flexible and adaptive networks involving ATTi Centers, the ATTi Initiative, other EWDP Initiatives, various Community Colleges, business, and government.
- Action 2:* Update ATTi's Five-Year Plan, integrating ITS with other transportation and energy-related technological advances, such as light and heavy duty hybrid vehicles, hydrogen technology, GPS, GIS, data base and analytical tool management, and new advances in air and rail transportation fuels and technologies.
- Action 3:* Continue to integrate flexible and adaptive programs with other EWDP Initiatives, such as the REBRAC Homeland Security and Emergency Response and other Community College programs such as Mechantronics. Utilize workforce training evaluation tools to make certain that business needs are well aligned with curriculum (this is not meant to be an overall program evaluation, which the Economic and Workforce Development Program (EWDP) already has in place but rather to be a tool to better steer curriculum).
- Action 4:* Partner with the University of California, the California State University System and other universities to anticipate and develop new academic and training curricula as new technology transfer produce opportunities for new workforce career ladders.
- Action 5:* Resolve various Community College and system wide policy issues that limit the Economic and Workforce Development Program, ATTi's and other initiative's ability to hire instructors, to fund successful centers, and to disburse and/or integrate key programs amongst campuses. Time Structures and the ATTi Initiative Director

believe the following focused options begin to flesh this out:

Option 1: Build bridges to full-time faculty.

Option 2: Complete the removal of the statutory sunset clause from the California Community College's Economic and Workforce Development Program's enabling legislation.

Option 3: The EWDP create or facilitate a strategy that will satisfy the Community College system making possible the rapid hiring of qualified part-time and full-time instructors for the Centers by examining limitations imposed by the "25%/75%" rule on program growth.

Option 4: The Economic and Workforce Development Program could investigate a strategy and develop options for a plan to facilitate movement of mature programs onto campus throughout the system without losing their essential capacity to generate new curricula in response to changing industry and workforce needs.

Option 5: Consider using the college administrator's survey to continue the current positive dialogue and relationship with college administrators.

Action 6: Consider using the business/government survey findings and literature review conducted as part of this study to guide development of ITS training curriculum and materials.
