

# **ELECTRIC VEHICLE SERVICE PERSONNEL TRAINING PROGRAM**

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**City College of San Francisco (CCSF)**

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# Overview

## Timeline

- Start: December 22, 2009
- End: December 21, 2012
- Percent complete: < 10%

## Budget

- Total project funding
  - DOE share: \$500,001
  - Contractor share: \$133,640
- FY09 Funding: \$ 0
- FY 10 Funding: \$ 184,000

## Barriers

- The investment required to train technicians to repair/maintain technologies is a MARKET BARRIER
- (Consumers) tend to be reluctant to purchase vehicles with new technologies that could be difficult to maintain (3.5.2.7)
- Early users need to have technical expertise and assistance (readily available (3.5.2.8))

## Partners

- Project lead
  - City College of San Francisco
- Interactions/ collaborations
  - Chabot College
  - Pat's Garage
  - Perfect Sky
  - San Francisco Municipal Shops

# Objectives (1)

- ▶ Provide expertise and assistance to consumers and fleet users of hybrids, PHEVs, EVs and FCVs through a trained maintenance workforce
- ▶ Educate the new generation of auto technicians to become familiar with “more electric” vehicles
- ▶ This expertise
  - simplifies maintenance accessibility
  - lowers cost of maintenance
  - assures vehicles operate with optimal environmental performance

# Objectives (2)

- ▶ Develop Hybrid, PHEV, EV and FCV curriculum and identify training aids for automotive technician programs, independent technicians, and municipal fleet operators.
  - ▶ Disseminate curriculum locally to test portability.
  - ▶ Disseminate to sample of colleges and employers in Southern California and neighboring states to identify training support and infrastructure needs
  - ▶ Adapt curriculum for high school/ vocational schools.
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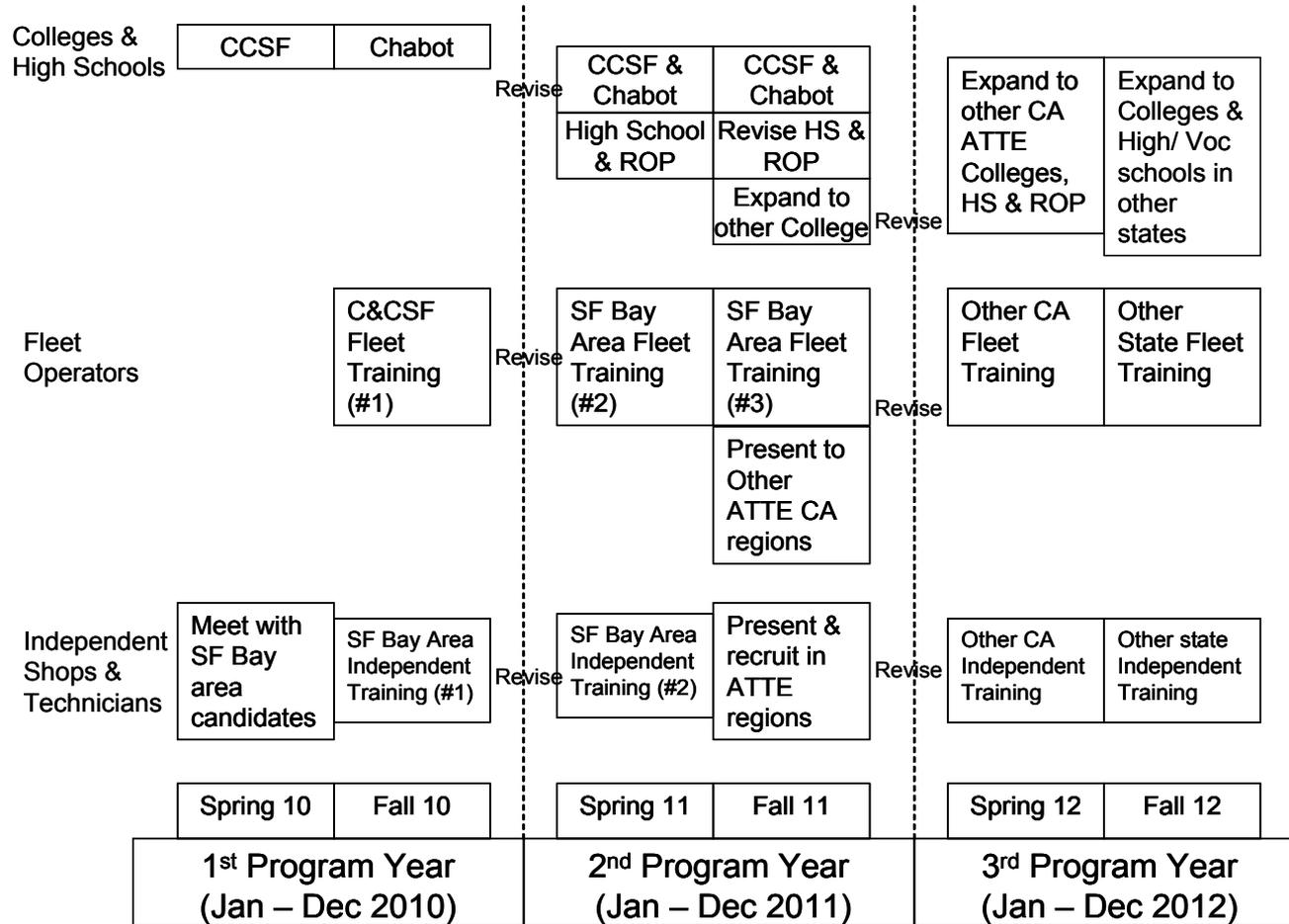
# Milestones

<b>Month/Year</b>	<b>Milestone</b>
December 2010	Milestone: <ul style="list-style-type: none"><li>- 2 to 3 classes of college instruction with evolving curriculum at host colleges CCSF and Chabot</li><li>- 1 class of fleet operator training</li><li>- 1 class of training for independent technicians</li></ul>
December 2011	Milestone: <ul style="list-style-type: none"><li>- Expand training to High School and/or ROPs</li><li>- Expand training to other SF Bay Area colleges, two fleet operators and technicians</li></ul>
December 2012	Milestone: <ul style="list-style-type: none"><li>- Expand training to a Southern California college, secondary school, fleet operator and independent technician group</li><li>- Expand training to a college, secondary school, fleet operator and independent technician group in Oregon or Washington state.</li></ul>

# Approach/ Strategy (1)

- ▶ The San Francisco Bay area has the second largest fleet of hybrids in the United States. It also has the second greatest density (hybrids per 100,000 population).
- ▶ Support and consumer problems will arise here first
- ▶ Our approach is to develop and pilot a series of related training courses, and then improve course content, equipment requirements and instructor skills.
  - Student
  - Fleet maintenance
  - Independent technicians
- ▶ Expanding the program geographically identifies problems with introducing this type of training.
- ▶ Widespread support lowers the cost of ownership and ensures vehicles operate in the manner they are designed.

# Approach/ Strategy (2)



# Technical Accomplishments & Progress (1)

- ▶ **Prior to study launch, first Hybrid Maintenance and Repair course piloted at CCSF during Fall 2009.**
  - **Donated Prius obtained from insurance company**
  - **Saturday class**
  - **30 students**
  - **Auto electrical course pre-requisite**
  - **Numerous industry (non-traditional student) attendees**
- ▶ **Study team kick-off meeting, February 2010**
- ▶ **Two of three partner contracts in place; third in process**
- ▶ **First curriculum-design meetings conducted with SF shops (site for municipal and private fleet maintenance training).**

# Technical Accomplishments & Progress (2)

- ▶ **First curriculum-design meeting conducted with Chabot College faculty for both their student program and independent technician program curriculum.**
  - ▶ **Initial equipment list developed for first round of training (diagnostic software, in addition to (donated) hybrid auto)**
  - ▶ **These accomplishments keep us on-track for meeting first year Milestones.**
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# Collaboration

## Perfect~Sky

### City & County of San Francisco Maintenance Shops

- Municipal Fleet support with over 300 Hybrids and EVs to maintain.
- Many now out of warranty.

- Hybrid Maintenance Training experts
- College and Industry Experience



- Supporting CA Community Colleges - Hymotion conversion center
- NATEF Certified auto technician programs to host expansions. - Extensive PHEV experience

# Proposed Future Work

## ▶ **For the remainder of 2010**

- Provide at least two “Introduction to Hybrid and Electric Vehicle Repair and Maintenance” classes (CCSF and Chabot College)
- During the summer, provide a first course to working maintenance personnel at SF Municipal Shops (with participation by local taxi and other fleet representatives)
- During the second half of the year, provide at least one training for independent technicians evenings and/or weekends.
- Update curriculum as new vehicle data becomes available
- Identify candidate locations for 2011 training

## ▶ **For 2011**

- Expand the geographic scope and refine curriculum per Milestones

# Summary

- ▶ The San Francisco Bay Area is one of the leading markets for hybrid and electric vehicles in the United States. Consumer problems need to be addressed here early to assure favorable transition to these new technologies.
- ▶ Beyond the factory-trained OEM service network, skills are lacking as regard hybrid and EV servicing. Yet older models are out-of-warranty and are moving out of dealer service networks. (This applies to both individual and fleet operators.)
- ▶ Current automotive students will be spending most of their careers with “more electric” automobiles. Hybrid and EV Maintenance and Repair skills have not yet worked their way into most auto program curriculums.
- ▶ This project is designed to develop and disseminate skills to students and incumbent technicians so workforce can respond to market demand.