
Advancing Fuel Cell Electric Vehicles in San Francisco and Beyond

Jessie Denver (Principle Investigator),
Suzanne Loosen (Primary Contact)
City and County of San Francisco
Department of the Environment
1 Dr. Carlton B. Goodlett PL, Room 300
San Francisco, CA 94102-4694
Phone: 415-355-3720
Email: Jessie.denver@sfgov.org

DOE Manager: Gregory Kleen
Phone: (240) 562-1672
Email: Gregory.Kleen@ee.doe.gov

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Subcontractors:

- Frontier Energy (formerly known as BKi)
- Newcomb Anderson McCormick
- Business Council on Climate Change

Project Start Date: October 1, 2017

Project End Date: March 31, 2019

Overall Objectives

- Provide community outreach and technical assistance to station developers in areas of station development.
- Update and harmonize best practices in permitting and inspection of hydrogen fueling stations among Bay Area authorities having jurisdiction (AHJs).
- Deliver hydrogen safety and best practice education to elected officials and planning, building inspection, and public safety professionals across the Bay Area.
- Increase community awareness of the availability and value of hydrogen and fuel cell electric vehicles (FCEVs).
- Drive market demand for FCEVs through an established, public-facing, group procurement program.

Fiscal Year (FY) 2018 Objectives

- Ongoing implementation of training and outreach plan.
- Continued community engagement.
- Conduct outreach to AHJs to facilitate hydrogen fueling station development.
- Reporting and dissemination.
- Continued implementation of SunShares group procurement program.

Technical Barriers

This project addresses the following technical barriers from the Education and Outreach section of the Fuel Cell Technologies Office Multi-Year Research, Development, and Demonstration Plan¹:

- (A) Lack of Readily Available, Objective, and Technically Accurate Information
- (D) Lack of Educated Trainers and Training Opportunities.

Contribution to Achievement of DOE Milestones

This project will contribute to achievement of the following DOE milestones from the Education and Outreach section of the Fuel Cell Technologies Office Multi-Year Research, Development, and Demonstration Plan:

- Task 1: Educate Safety and Code Officials
- Task 2: Educate Local Communities
- Task 3: Educate State and Local Government Representatives
- Task 4: Educate Potential End-Users.

¹ <https://energy.gov/eere/fuelcells/downloads/fuel-cell-technologies-office-multi-year-research-development-and-22>

FY 2018 Accomplishments

- Implemented training and outreach schedule.
- Implemented community engagement plan.
- Conducted outreach to AHJs to streamline permitting processes.
- Completed project reporting and dissemination.
- Implemented FCEV group-buy program.

INTRODUCTION

This program supports the introduction of FCEVs and retail hydrogen fueling stations in San Francisco and the nine-county Bay Area. Per a January 2018 Executive Order from the Governor’s office, California has a goal of 5 million zero-emission vehicles on the roads by 2030. To support deployment of zero-emission vehicles, the state also is working to develop 200 hydrogen stations by 2025. By applying lessons learned from the market transformation the solar industry experienced the last decade, we are working on reducing soft costs tied to two primary barriers. The first is the cost and complexity of permitting and inspection processes associated with hydrogen station development among multiple AHJs, and the second is a lack of consumer awareness of hydrogen and FCEVs.

APPROACH

To address the cost and complexity of permitting, we provided training and technical assistance to AHJs and station developers in proposed project areas. This included organizing and facilitating pre-application meetings, documenting permitting and inspection processes among AHJs, publishing a newsletter, and developing specialized trainings. As stations near project completion, we will organize local community awareness events in partnership with the AHJ and station developer.

To address the lack of consumer awareness, we worked with the SunShares group procurement program to provide discounts on FCEVs coupled with consumer workshops for residents throughout the greater Bay Area, leveraging established communication channels to reach consumers (e.g., affiliate groups, employers, and local government). We also have incorporated FCEVs in our annual Clean Cities workshops and local ride-and-drive events.

RESULTS

Our work supports hydrogen station development in San Francisco and the nine-county Bay Area. Figure 1 shows stations that are open or in development as of Fall 2018.

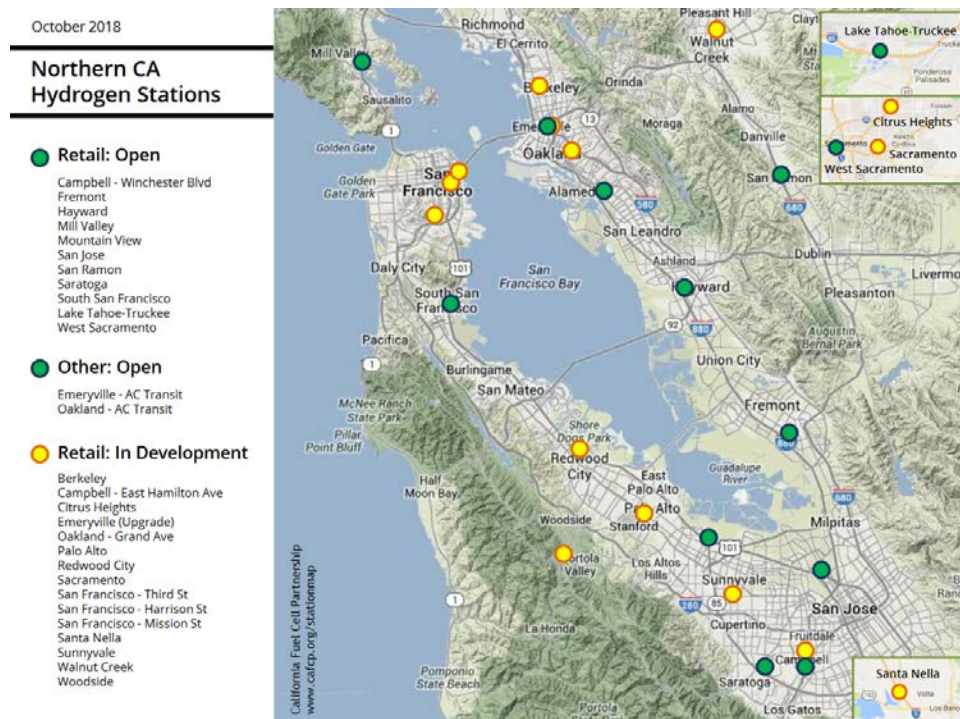


Figure 1. Map of San Francisco Bay Area hydrogen stations, Fall 2018

To accommodate delays in the station development schedule for San Francisco-specific projects, a six-month, no-cost extension was applied for and granted by DOE. This allowed us to schedule first-responder trainings, which are highlighted in Table 1. It also enabled us to ensure we could hold community meetings closer to station opening, a best practice according to the California Fuel Cell Partnership.

In addition to planned events, we found a unique opportunity to present an overview of hydrogen fueling station development and technical resources to the Steering Committee of the Bay Area Planning Directors Association. Following the presentation, we provided a summary of technical resources to the Steering Committee, which was sent to Bay Area Planning Directors Association members representing most municipalities in the Bay Area.

Table 1. Training and Outreach Schedule

Topic	Audience	Date	Type
Hydrogen Safety for Permitting Authorities	Building officials, planning and sustainability staff	July 19, 2017	Webinar
Regional Briefings on Fuel Cell Electric Vehicles and Hydrogen Station Development—South Bay	Elected officials, municipal staff, public	January 23, 2018	Half-day workshop
Regional Briefings on Fuel Cell Electric Vehicles and Hydrogen Station Development—North Bay	Elected officials, municipal staff, public	January 26, 2018	Half-day workshop
Overview of Hydrogen Fueling Station Development and Technical Resources	Bay Area Planning Directors Association	July 13, 2018	Presentation to Steering Committee and mailing to membership
Hydrogen Safety Training for First Responders—North Bay	Public safety and fire department first responders	October 3, 2018	Full-day training session
Hydrogen Safety Training for First Responders—South Bay	Public safety and fire department first responders	October 4, 2018	Full-day training session

To increase community awareness, we also participated in a broad range of outreach events that included static displays of FCEVs and vehicle test drives (see Table 2).

Table 2. Community Engagement Schedule

Topic/Event	Audience	Date	Type
SEMICON West Conference, San Francisco	Microelectronics conference and exhibition attendees	July 10–13, 2017	Static FCEV display
Intersolar North America, San Francisco	Conference and exhibition attendees	July 12–13, 2017	Static FCEV display
National Drive Electric Week	Public, elected officials	September 23, 2017	Test drives
East Bay Regional Park District Green Expo	Staff and supporters of regional parks	October 4, 2017	Static FCEV display
Fleet Week	Public, elected officials	October 6–7, 2017	Static FCEV display, test drives
Proposed Hydrogen Station—Berkeley	Public, elected officials, municipal staff	March 30, 2018	Public meeting (evening)
Earth Day San Francisco	Public, elected officials	April 21, 2018	Static FCEV display

To increase awareness of hydrogen and FCEVs beyond the Bay Area, we scheduled presentations at three regional or national events. Those are included in Table 3.

Table 3. Dissemination Schedule

Topic	Audience	Event	Date	Co-Presenter
Overview of Fuel Cell Electric Vehicles and Hydrogen Station Development	Fleet managers, public	Northern California Alt Car Expo, Oakland, CA	March 21, 2018	UC Berkeley Transportation Sustainability Research Center
Overview of Fuel Cell Electric Vehicles and Hydrogen Station Development	West coast fleet managers, technical and government staff	Green Transportation Summit and Expo, Tacoma, WA	April 17, 2018	Hydrogen Safety Council
Overview of Fuel Cell Electric Vehicles and Hydrogen Station Development	Clean Cities coordinators and stakeholders	DOE Clean Cities Annual Peer Exchange, Cocoa Beach, FL	November 7, 2018	Greater New Haven Clean Cities Coalition

The monthly *SF Clean Cities Hydrogen and Fuel Cell Electric Vehicle Newsletter* now has 350 subscribers and will likely continue beyond the project term as a Clean Cities project. Content includes a summary of a top news story, along with videos and links to news articles, and an update on California hydrogen fueling station development.

Our no-cost extension also facilitated the participation in an additional year of the SunShares group procurement program. SunShares offers pre-vetted discounts on residential solar photovoltaic systems and zero-emission vehicles. For the three years covered (2016–2018), the program featured the Toyota Mirai. The program conducts outreach to consumers through 40–50 public- and private-sector affinity groups (e.g., municipalities and large employers), which means that thousands of Bay Area residents learned about the benefits of longer range and ease of fueling associated with FCEVs. Program results have been documented in a case study.

CONCLUSIONS AND UPCOMING ACTIVITIES

The project has been successful in educating AHJs, elected officials, and the public about hydrogen and FCEVs. We have offered robust technical assistance to AHJs and delivered technical resources to decision makers across the Bay Area.

One of the objectives of the project was to harmonize permitting practices among AHJs. This approach has been successful in the past for reducing soft costs and supporting market transformation of residential solar photovoltaic installations, so that project developers have a consistent set of requirements across the cities they work in.

In practice, we found that permitting for gaseous fueling stations is context-dependent in AHJs, based on local knowledge and political environment. For example, one community allowed parallel planning, building, and fire safety review and issued permits within a few months. Another community allowed project review only in series and required an outside consultant to conduct an extensive environmental review, adding several months to the permitting process. Both proposed sites were existing petroleum fueling stations, and both AHJs had participated in a pre-application meeting according to best practice and California Energy Commission grant requirements.

We also found that AHJs in general were not receptive to documenting existing permitting processes for compressed natural gas stations (as proposed) or in participating in a standardized permitting process. Documentation of our experience with this task will be included in a case study.

Upcoming activities include hydrogen safety training for first responders and a San Francisco community meeting in January 2019. The community meeting will include presentations by the station developer, California Energy Commission, and the Governor’s Office of Business Development. In addition, another case study will be developed on training and community engagement.