AC Transit presents… Many Shades of Green

Zero-emission fuel cell buses...

Acres of solar panels...

Reduced emissions...

Alternative energy...

Providing public transit...

Leading the region…and the nation.

The HyRoad is...

AC Transit's Zero-Emission Fuel Cell Program
Fuel cell buses are clean, quiet, electrically propelled vehicles that emit only water vapor from the tailpipe. For over a decade, AC Transit has been building the most comprehensive fuel cell program in North America.

Zero-Emission Vehicles
Twelve 40' hybrid-electric fuel cell buses, each powered by a 120 kW UTC fuel cell system, use Ener1 lithium ion batteries and hybrid-electric technology to store regenerative braking energy and provide up to 125 kW of booster power.

Energy Stations
AC Transit's on-site Energy Stations, engineered by Linde North America, enable buses to be refueled in just six minutes.

- AC Transit's Emeryville Division uses solar-powered electrolysis to produce 65 kg of hydrogen per day. The station can dispense up to 420 kg of hydrogen per day.
- AC Transit's Oakland Division uses directed biogas from landfills or animal feedlots to fuel stationary fuel cells, providing 400 kW of electricity to AC Transit's largest operating division. This system powers an electrolyzer that produces up to 65 kg of hydrogen daily. The overall station capacity is rated at 360 kg of hydrogen per day.

Education and Outreach

- Mobile Learning Centers: Fuel cell bus interiors bring educational messages about hydrogen and fuel cell technology directly to hundreds of thousands of Bay Area riders.
- High-School Science Curriculum ("HyTech"): Developed in partnership with Lawrence Hall of Science, UC Berkeley and Schatz Energy Research Center at Humboldt State University
- First-Responder Training
- Web-Based Education (*http://tinyurl.com/3hxklox*)

Evaluation
The importance of the HyRoad goes far beyond our local environment. This program is being monitored and evaluated by the Department of Energy's National Renewable Energy Laboratory, and hopes to prove the viability of fuel cells and a zero-emission public transit system to the rest of the world.

A Fuel Cell Is...

A zero-emission generator that uses an electrochemical reaction to produce electricity. Unlike a battery, a fuel cell never needs recharging. It continues to produce electricity as long as it is supplied by two of earth's most common elements—oxygen and hydrogen.

Funding

HyRoad program is supported by generous grants from the California Energy Commission, California Air Resources Board, Bay Area Air Quality Management District, Metropolitan Transportation Commission, and the Federal Transit Administration.

California Environmental Protection Agency
Air Resources Board

Bay Area Air Quality Management District
Transportation Fund for Clean Air

Metropolitan Transportation Commission

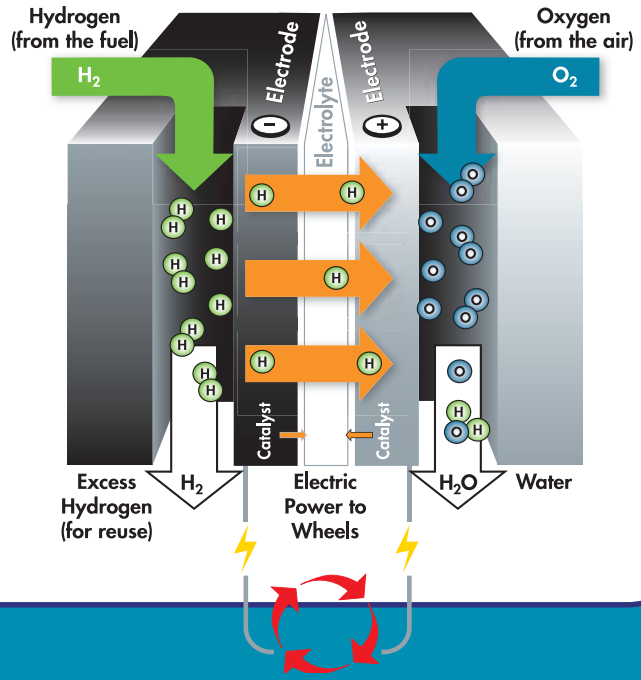
U.S. Department of Transportation
Federal Transit Administration

Funds are tagged for these specific environmental programs and may not be used for any other purpose.

How It Works:

When hydrogen and oxygen combine, they create water and electricity.

In a fuel cell, the protons from hydrogen pass through a membrane to the other side of the cell. The electrons from the hydrogen can't pass through the membrane, so they reach the other side of the cell through a circuit, producing electricity. The protons, electrons and oxygen from the air then combine to form water.



Reducing Emissions

By providing public transit to 200,000 riders every weekday, we are keeping tens of thousands of cars off the roads—and keeping their pollution out of the air. We're also doing all we can to reduce our own emissions.

Installing Solar Roofs

AC Transit has installed over 2,500 photovoltaic (PV) solar panels on the roofs of its Hayward and Oakland-Seminary Divisions. These PV systems deliver 625 kW of electricity—a significant portion of the power required to operate each facility during the day. This year and next, we are more than doubling our solar electricity generation by adding an additional 700 kW of capacity to our Central Maintenance Facility and other roofs, thanks to a $6.4 million grant from the Federal Transit Administration.

Installing Stationary Fuel Cells Running on Directed Biogas

AC Transit is the recipient of another $6 million FTA grant to install 400 kW of solid oxide fuel cells that will provide stationary power to its largest operating division. These fuel cells provide electric power at an average efficiency of 52%, compared to the high 30s and low 40s of standard grid power. This will not only result in considerable savings in power consumption, but will also lead to a reduction in 1,800 tons of CO_2 emissions annually.

Running Cleaner Engines

AC Transit has installed exhaust-after-treatment traps in 355 of its older buses. These traps not only cut particulate pollution by 94%, they also reduced nitrogen oxide emissions by 25-30% and hydrocarbons and carbon monoxide by up to 90%.

Reducing Greenhouse Gases

AC Transit was the first transit agency to join the California Climate Action Registry. We began tracking our greenhouse emissions in 2006 and continue to report emissions annually to the nationally based "The Climate Registry." For our rigorous efforts, the Registry has named AC Transit a "Climate Action Leader."

Regional Efforts

In the Bay Area, more air pollution comes from motor vehicles than from any other source. So every time someone takes public transit instead of a car, we can all breathe a little easier.

For over 50 years, AC Transit has been working to get people out of their cars and into transit:

- Creating outreach programs to encourage students and city workers to take the bus
- Promoting transit-oriented development to increase ridership base
- Developing Bus Rapid Transit to improve efficiency

Now, AC Transit is acting as the lead agency in Zero Emission Bay Area (ZEBA), a group of regional transit agencies jointly operating twelve zero-emission fuel cell buses in real-world service throughout the Bay Area.

ZEBA Partners

- Golden Gate Transit
- MUNI
- Samtrans
- VTA

Together, these agencies serve seven California counties with a combined population of over 6.8 million people. And AC Transit is proud to be taking the lead, establishing standards that are being observed worldwide.

For more information about
AC Transit's environmental initiatives,
please visit **www.actransit.org/environment**
or follow our daily updates on
twitter **@act_environment**

Alameda-Contra Costa Transit District
1600 Franklin Street
Oakland, CA 94612

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