

EVs in Transit

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Helping bring you tomorrow's technology ... today!

Electric buses offer a fun ride Vehicles proliferate in parks, campuses, cities

Electric buses carry kids to Disneyland, college students to class in Oregon, and Miami Beach tourists to the nightclubs of South Beach. In the United States, they are staking out a unique transportation niche across the landscape.

"They're fun to ride," notes Judy Evans, director of the Miami Beach electric shuttle operation. "For people who don't usually ride the bus, they offer a different kind of public transportation experience."

Because the buses are very quiet and emission-free, people find them a comfortable and pleasant form of transportation. Decorated with attention-grabbing artwork, they're often found in places where fun things are happening. Casual seating that wraps around the perimeter of the bus allows passengers to talk to each other and still enjoy the view out the window.



Students in Eugene, Oregon, "breeze" to class.



In Anaheim, a trolley-style electric shuttle operates alongside the Disneyland tram.

In California, electric buses can be found on the streets of Visalia, Santa Clara and Anaheim. Anaheim's trolley-style buses pick up hotel guests and shuttle them to Disneyland and back. Visalia decided to go electric when it made the American Lung Association's top 10 most-polluted cities list. Santa Clara operates three large hybrid-electric buses that serve as a commuter shuttle.

In Miami Beach, people take the ELECTROWAVE shuttle to the restaurants, shopping, clubs and attractions on busy Collins Avenue. The only all-electric transit system in the United States, the Miami Beach TMA operates 11 ELECTROWAVE buses, which have carried more than 4 million passengers in the past four years. Each bus is brightly painted with a unique design by one of the area's local artists.

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7 U.S. sustainable cities recognized Chattanooga and Denver win awards for transportation

“We must foster a revolution in how we produce, find and deliver energy,” according to David Garman, Assistant Secretary of Energy for Energy Efficiency and Renewable Energy. Mr. Garman presented awards to finalists in the *Energizing America’s Cities* competition, sponsored by the Gas Technology Institute and the Department of Energy. Seven finalists were selected from more than 50 cities nationwide.

Chattanooga was among those receiving an award in Chicago for its energy-efficient electric bus initiative, which is also friendly to the environment.

The city’s fleet of quiet, low-emission electric shuttle buses was judged the best approach to alternative fuels and mass transit of all those submitted. Since 1992, the popular electric and hybrid buses have provided free transportation on

a busy two-mile loop. The shuttle has had a positive impact on air quality, stimulated tourism, and generated more than 100 transportation jobs in the region.

The city of Denver was also honored as a finalist for its “clean” fleet of 240 vehicles fueled by natural gas, propane and electricity. Denver has worked on developing “hythane” (a mixture of 15 percent hydrogen and 85 percent natural gas), and it was the second city to receive the U.S. Department of Energy’s Clean Cities Award.

“A sustainable future is better than the comfortable present.”

—David Garman, U.S. Department of Energy

“Seven cities have shown that there are technologies that can perform as well as conventional technologies, and also be sustainable,” Mr. Garman said. “A sustainable future is better than the comfortable present. Our challenge is to paint a picture of the future that captures the public imagination.”

The other five finalists were San Diego, Seattle, Portland, OR; Austin and Chicago. Each won top honors in a different category of metropolitan building design. San Diego’s energy plan, judged the best overall, focused on advanced technologies such as solar and fuel cells, clean transportation strategies, and plans to reduce



Passengers ride free on a hybrid-electric bus to Denver’s popular downtown mall.

energy-related emissions, curb urban sprawl and revitalize the region’s commercial centers. San Diego’s plan will become the U.S. entry to the international competition in Tokyo, Japan, in June 2003. All seven winning U.S. initiatives will be presented by their city sponsors at that event.

The international competition will stimulate new thought and practices that will result in more livable cities for the next 100 years. San Diego will join Buenos Aires, Argentina; Vancouver, Canada; Changshu, China; Berlin, Germany; Goa, India; Tokyo and Mishima, Japan; and Vologda, Russia at the awards competition in Tokyo.



The electric shuttle stops at Chattanooga’s top attraction, the Tennessee Aquarium.



John Powell, Susan Thomas and Jim Frierson of ETVI accept Chattanooga’s award from John Kelly of the Gas Technology Institute.

Transit expo unveils new technologies

BRT, hybrids and monorail star attractions

The city of Las Vegas is in the midst of two dramatic transportation programs, which were the highlights of this year's American Public Transportation Association annual conference and vehicle expo. The event, which was held recently in the Las Vegas convention center, drew more than 20,000 transportation professionals.

Monorail's not just for Disney

A futuristic Disney World-style monorail is now under construction in Las Vegas. The monorail will travel the resort corridor from downtown to the strip in 2004. City officials hope that it will take at least 4 million car trips off the city's roads each year, reducing traffic congestion and improving air quality. The speedy train is being built entirely with private funds and will connect eight resort hotels in four miles of the strip, from the MGM Grand on the south end to the Sahara in the north. From its lofty guideway, passengers will enjoy an unsurpassed view of the Las Vegas skyline. The monorail's sleek, bullet-shaped driverless cars will travel 50 miles per hour and will



The *Civis* rapid transit bus, on display in Las Vegas, was awash in stars and stripes.

provide air-conditioned comfort from the desert heat.

Civis named one of 2001's best inventions

The other exciting Las Vegas project is the bus rapid transit initiative featuring *Civis*, an advanced bus that will begin operating in 2003. Manufactured in France by Irisbus, the *Civis* uses diesel/electric propulsion. It has an optical guidance system (a camera-like eye which scans a painted line on the roadway), so the driver does not have to steer the vehicle, merely brake and accelerate.

Passengers will be able to board the *Civis* directly from the platform, train-style, without going up a step or off a curb. Although it is sleek and rail-like in appearance, the *Civis* is much less expensive than rail and can use an existing traffic lane—no road construction is required. Through May 2003, the *Civis* will tour several U.S. cities, including San Diego, Orange County, Atlanta, Charlotte and Cleveland.

Hybrids are hot

An array of new hybrid vehicles also caused excitement at Expo 2002. One of the most dramatic was a 60 ft.-long articulated bus manufactured by New Flyer, featuring the Allison parallel HybriDrive system. The bus was recently delivered to King County, Washington, which has put it into route service testing. The first bus of its kind ever built, the vehicle made its official debut on October 23rd in Seattle, with a big press event in the Seahawk Stadium.



With no curbs or steps, the rail-like *Civis* bus offers easy platform boarding.

New hybrid vehicles were also presented at the expo by Advanced Vehicle Systems, Ebus, Gillig, MCI and other manufacturers.



The Las Vegas monorail will take visitors sky-high in 2003.

Museums charged up about EV1 donations

Recipients include CARTA's Electric Vehicle Info Center

A new attraction is bringing visitors to the Electric Vehicle Information Center in Chattanooga, Tennessee. A General Motors EV1 zero-emission, pure electric car is now on permanent display there. The car was one of a dozen awarded in the second round of GM's EV1 donation program to U.S. universities, museums and technology centers.

The brilliant green EV1 now sits proudly among the Center's other interactive and learning displays. It stands opposite a battery-powered 1979 VW Rabbit hatchback, an electric police bike and a battery charging station. Nearby, the Kids' Corner features a variety of learning games, interactive exhibits, and a toy electric car.

"We're proud to display this unique electric EV1 car," said Tom Dugan



The EV1 is charged from an opening in the car's front grille.

of the Chattanooga Area Regional Transportation Authority (CARTA), which manages the Information Center. "It's a forerunner of the environmentally friendly hybrid and fuel cell cars that today's children will drive when they grow up. We're excited to be selected as a recipient."

The shiny new car is bringing more people into the Center, said Valerie Powell, the Center's manager. "It's one of the first exhibits they go to," she said. "People stand outside and look in the windows while they wait for the shuttle. Because the car catches their eye, it draws them in."

The Electric Vehicle Information Center is a public access museum dedicated solely to electric vehicles. It attracts more than 30,000 visitors each year.

Eleven other museums, universities and technology centers in the U.S. received an EV1 car in this round of awards, including Brigham Young University; the University of Cincinnati; the Cleveland Institute of Art; the Detroit Science Center; Henry Ford Museum and Greenfield Village; Mid-Del Technology Center in Midwest City, Oklahoma; Mott Community College; Nethercutt Collection and Museum in Sylmar, California; and



Brandi Barker of GM introduces the EV1 to Rep. Zach Wamp (TN-3rd district), named one of Congress's "Clean 14" for his sponsorship of renewable fuels legislation.

the Oldsmobile/GM Heritage Center in Lansing, Michigan.

Since 1997, General Motors has leased hundreds of its sporty, nonpolluting EV1s to environmental and technology enthusiasts in California and Arizona. Although it no longer manufactures the car, GM says it is applying lessons learned from the project to develop fuel cell cars for the future. ■



An EV1 is displayed at the Electric Vehicle Information Center.

Electric buses fun to ride

Continued from page 1

In the college town of Eugene, Oregon, University of Oregon students catch the "Breeze," one of the city's six hybrid-electric buses. Hard to miss with its luminous blue paint, the Breeze stops at bus shelters that are whimsically decorated with metal pictures of people who might be found at that stop. A chef and waitress adorn one stop, a shopper and her tie-dye-wearing child another, a golfer at the country club another, and so forth. The buses come every ten minutes, taking passengers from downtown to the university and back for a 25-cent fare.

In Los Angeles, the Department of Water & Power has 16 electric buses in operation, which took their maiden run during the Democratic National Convention in 2000. Purchased from two manufacturers, Advanced Vehicle Systems and Ebus, the buses operate on two routes. The harbor area San Pedro Trolley is heavily used by cruise ship staff, and the challenging, hilly downtown shuttle route is popular with a variety of riders.

The upscale community of Santa Barbara, California has the most diversified fleet of electric buses in the United States, with five different types



There are no unpleasant "jolts" aboard this "Stingray."



LADWP's city hall electric shuttle.

of vehicles. Santa Barbara's transit authority has decided to purchase 20 large electric buses to replace its regular diesel buses in route service, and has started operating a new state-of-the-art charging facility. One of the most innovative vehicles in the fleet is a bright yellow 30-foot pure electric bus called the Stingray. It has an impressive range of 130 miles (or 160 miles with rapid charging).

New Haven, Connecticut, the home of Yale University, has acquired a small fleet of trolley-style buses for the historic city square. Local people and tourists can now take the electric trolley on a downtown circulator route to restaurants, theatres, and the art district. New Haven's mayor John DeStefano first got the idea from his tailor, who enjoys riding a similar trolley on his vacations in Maine. Impressed with how happy he felt every time he rode the trolley, tailor Sidney Glucksman wanted New Haven to have the same experience.

A public and private joint effort of the New Haven and Connecticut transit agencies, Clean Cities, the electric company and a bank resulted in the purchase of four electric buses with

old-fashioned trolley styling. Officials thought that the trolley styling would fit in perfectly with the city's historic flavor. The electric shuttle service has generated much fanfare and even has its own web page.

In Norfolk, Virginia, and Chattanooga, Tennessee, electric buses serve busy downtown circulator routes. In both cities, the shuttle is free to passengers. Norfolk's NET buses carry many of the city's work force between their offices and one of several outlying park & ride lots. Parking lot revenues help pay for the shuttle operation. Reflecting the flavor of Norfolk, which lies on the Chesapeake Bay, each NET bus is painted a deep aqua blue and adorned with the city's mermaid motif.



New Haven officials meet the press during dedication ceremonies of the electric trolley.

While some of the electric shuttle services charge a 25-cent fare, most are free, which adds to the enjoyment of the riding experience. As the popularity of electric buses continues to grow, it's anyone's guess where they will turn up next.

Attend EVAA conference in Florida

The Electric Vehicle Association of America will hold its next **Electric Transportation Industry Conference** on **December 10-13** in Hollywood, Florida. There will be battery, hybrid and fuel cell vehicles to test drive, as well as workshops on hydrogen safety and plug-in HEVs, and an exhibit hall. For more information, visit www.eticonference.com or e-mail Kara Elsdén, kelsden@evaa.org.



Low-speed motor helps hybrid bus keep its cool

Citizens of Atlanta, Macon and Augusta, Georgia, are getting a sneak peek at an unusual hybrid bus. Georgia Power Company is traveling to selected sites around the state demonstrating a unique propulsion system that can make a hybrid-electric bus more reliable and less expensive.

Developed by engineers at SK International, the propulsion system uses a heavy-duty motor that operates at a very low speed (3,000 rpm). The motor effectively eliminates any potential problems caused by overheating. The system is versatile enough to allow the bus to be used on many different kinds of routes.

In addition, the low-speed



A Bluebird bus with the SKI hybrid propulsion system goes through its paces at Georgia Power.

motor costs much less than specially built motors, using robust off-the-shelf components that can be readily replaced when needed.

“This could be an important breakthrough in hybrid technology,” noted Polly Albitz of Georgia Power. “The potential cost savings of this system could open up new markets for hybrid-electric vehicles and advance public acceptance of hybrid buses.”

Green power breezes across the midwest

A new wind farm has begun supplying green power to the midwest. The farm’s seven wind turbines (each as tall as a 35-foot building) produce enough electricity to power 4,000 homes a year. The Municipal Energy Agency of Nebraska (MEAN) sells the power generated by these windmills to homes, businesses and communities that want to buy renewable fuels as part of their commitment to clean energy.

Wind power, the fastest growing type of renewable energy,

generates electricity with no emissions. Unlike oil, the price of wind power can remain stable for decades. The Nebraska turbines take up about an acre of pasture land. On windy days, they can generate power at much less cost than conventional power plants.

The Tennessee Valley Infrastructure Group, a consortium that built the wind farm, also has several projects underway to bring affordable renewable energy to underdeveloped countries. (Up to 30 percent of the world’s population lacks

access to electricity.) According to the company’s spokeswoman, Pam Miles, TVIG has renewable energy initiatives underway in Haiti, Honduras and Nigeria.



A propeller larger than the wingspan of a Boeing 747 is lifted by crane onto a wind turbine in Kimball, Nebraska.

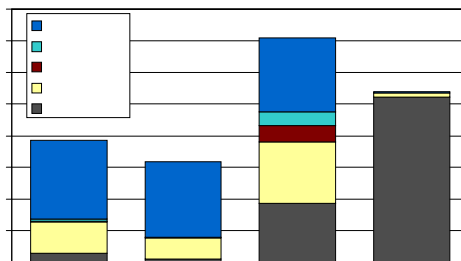
VIEWPOINT:***If we want clean cities, we must end our reliance on oil***

by Jonathan Overly

Compared to other large sectors of the economy, such as the industrial, commercial and even utilities sectors, transportation is definitely addicted to one fuel—crude oil. Ninety-seven percent of the fuel used in transportation is petroleum. Other sectors are more diversified and rely more on domestic sources. Utilities, for example, depend heavily on coal, a domestic product, albeit a nonrenewable one. At least in the short term, while we work on finding more sustainable ways to produce and use energy, we can count on the U. S., and not others, to supply that fuel.

Looking at the other fuel choices that exist, like electricity, natural gas and renewables, we see some startling facts. Electricity is already produced from a variety of fuels, and work is underway to produce more of it from renewables like biomass, wind, solar and tidal energy. Each of these renewables can be produced domestically, aiding farmers and other “home-town” people and industries along the way.

Electricity itself can be produced from a wide variety of fuels, most of which are produced in significant quantities domestically. About 94 percent of the natural gas consumed in the United States is domestically produced, and it is much cleaner in emissions than many of its competitor fuels. Renewable fuels like



biodiesel and ethanol are already being used in the transportation sector in significant quantities, and we can grow the feedstocks (even using recycled waste cooking oil for biodiesel) to supply our fuel demand.

Increasing the energy efficiency of our transportation systems is the smartest and most advantageous move we can make to reduce oil dependence. Every unit increase in overall efficiency of vehicles simultaneously reduces dependence on petroleum and the environmental impacts of those vehicles (air emissions, solid waste, water pollution, nonrenewable resource use, and so forth). However, increasing the efficiency of vehicles alone doesn't help to diversify our fuel sources. We need to start using a greater variety of fuels in our transportation system. Electricity, biodiesel, propane and natural gas are just some of the options that are available today which can move us in the right direction.

Jonathan Overly is the Coordinator of the East Tennessee Clean Fuels Coalition, a group working to expand alternative fuels use in the transportation sector in East Tennessee. Contact him at 865-974-3625, or see www.etcfc.org.

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EVs IN TRANSIT

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Couple choose electric shuttle for "I do's"

When Melynda Boucher and Manny Hadad were planning their sunset wedding on Miami Beach, they decided to rent two ELECTROWAVE shuttle buses for the occasion. They asked the wedding guests to leave their cars in the parking lot and ride one of the zero-emission electric buses to the wedding site. During the short ride, the drivers wore special wedding attire and the guests listened to (what else?) Beach Boys music.

After the ceremony, the guests headed to the reception on an

ELECTROWAVE bus decorated with balloons and streamers.

Why the unusual transportation? "We wanted our guests to have a genuine South Beach experience," explained the bride, who graduated with a minor in environmental science. "What better way than with a mystery ride on an electric bus?"

The couple had always enjoyed taking the shuttle on dates in South Beach, she added. They like the different artistic designs on the buses and the idea of riding an all-electric, environmentally clean bus.



Wedding guests ride pollution-free on the electric shuttle.



This bride and groom would rather take the bus.

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