



US Postal Service Alternative Fuels Program



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Hilton San Diego Resort – San Diego, CA



USPS General Overview

- 700,000 employees
 - 38,000 post offices
 - 200 processing centers
 - 36 airport mail centers
 - 24 bulk mail centers
 - 322 vehicle maintenance facilities
 - 145 million delivery points / six days a week
 - Adds 1.9 million new delivery addresses each year
 - 210,000 vehicles in the fleet
 - USPS vehicles travel 1.2 billion miles each year
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The Postal Fleet

Total Number of Vehicles: 210,000

- **Class 8 Tractors (Diesel)** **1,800**
 - **Spotter Tractors (Diesel)** **400**
 - **Class 7 Cargo Van (Diesel)** **2,500**
 - **Step Van (Diesel)** **8,500**
 - **Carrier Route Vehicles (CRV):**
 - **GM, Long Life Vehicles** **143,000**
 - **Ford, Flexible Fuel Vehicles (FFV)** **23,000**
 - **Dodge Caravan (FFV)** **10,000**
 - **Admin Vehicles (FFV)** **12,000**
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Vehicle Engineering-Alternative Fuels Program

The United States Postal Service is committed to reducing petroleum consumption and minimizing environmental impact through the use of alternative fuels.

Current United States Postal Service alternative fuel programs involve:

- Light duty hybrids electric
 - Medium duty hybrids electric
 - Clean diesel
 - Biodiesel
 - Hydrogen fuel cell
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The Postal Fleet

2005 Annual Fuel Consumption (gallons equiv.)

•Gasoline	106,800,000 gallons
•Diesel	21,000,000
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•Bio-diesel (B20)	1,020,000
•E-85	582,000
•CNG	(221,000)
•Electric	(1,593)
•Propane	(15,325)



Alternative Fuel Program Biodiesel (B20)

- **Biodiesel is used at four locations: New York City, Detroit, St. Louis and Orlando. Total Gallons of B20 used in FY05: 1,020,000.**
 - **Biodiesel is used to meet EPA Act requirements.**
 - **Major issues with biodiesel use:**
 - **Fuel filter clogging, particularly on the Mack tractors.**
 - **Biodiesel mixed higher than 5% (B05) not supported by engine manufacturers.**
 - **Fuel quality & bio content.**
 - **Microbial growth in ground tanks and fuel system.**
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Alternative Fuel Program Biodiesel Engine Teardown Analysis

- U.S. Postal Service and the National Renewable Energy Laboratory (NREL) funded an engine and fuel system teardown analysis on vehicles had been fueled with B20 in Miami Florida.
 - Two 1993 Ford cargo vans and two 1996 Mack tractors were analysed at Roush industries in Detroit MI along with Identical vehicles with no exposure to biodiesel for comparison.
 - Cargo vans showed no significant effects from biodiesel use.
 - Biodiesel Tractors had sludge deposits at the top of the cylinder heads that was attributed to poorly processed fuel. Injectors also showed effects from biodiesel usage.
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Alternative Fuel Program Compressed Natural Gas (CNG)

- Since the early 1990 6,000 LLV's have been retrofitted to run on CNG.
- In 2005 CNG usage was equal to 221,000 gallons of gasoline.
- CNG usage is on the decline do to issues with fueling infrastructure and LLV fuel system part availability.





Alternative Fuel Program Ethanol E-85

- **USPS is mandated by EPA Act that 75% of light-duty vehicle acquisitions must be AFV.**
- **Out of 21,000+ Ford FFV'S only 1000 use E85 on a regularly.**
- **E85 not available in most locations.**
- **582,000 gallons used in 2005.**
- **26% drop in MPG.**





Alternative Fuel Program Medium-Duty Hybrids

- **Azure Dynamics Series Hybrid Cargo van on loan to the USPS, deployed in Boston MA.**
- **Data is being collected to determine real-world fuel economy and operational maintenance costs.**
- **In 2006, Vehicle Engineering plans to perform lab-testing on this vehicle for emissions and fuel economy characteristics in a controlled environment.**
- **Initial results show hybrid cargo van achieving a 11.9 MPG . Standard cargo van averaged 8 MPG on same route.**





Alternative Fuel Program

Zero-emission Electric Trucks

- 28 zero-emission electric delivery trucks are in service in the New York Metro Area.
- Azure Dynamics CitiVans are two-ton delivery trucks that replaced diesel-powered trucks used to transport mail and bulk packages between central distribution facilities and neighborhood post offices.
- The trucks can travel 40 miles on a complete charge, with a top speed of 60 mph.





Alternative Fuel Program Light-Duty Hybrid, Toyota Prius

- **Vehicle Engineering acquired a Toyota Prius hybrid passenger car and completed a 24,000 mile durability test.**
- **Testing was performed Transportation Research Center Inc. in Ohio for emissions and fuel economy data.**
- **A simulation was performed to predict the fuel economy and emissions characteristics of the Prius drive train if it was fitter to a carrier route vehicle (CRV). Fuel economy results indicated this hybrid technology could improve CRV gas mileage up to 117°.**





Alternative Fuel Program Light-Duty Hybrid, Ford Escape

- **10 Ford Escapes are being tested in Huntington Beach and Sacramento, California to gain more real-world experience with light-duty hybrid vehicles.**
- **Test is being performed to collect real-world fuel economy data and operational maintenance costs.**





Alternative Fuel Program

Clean Diesel for Light Duty Applications

- 10 Chrysler Jeep Liberty diesels are being evaluation in Peoria, IL.
- The US Postal Service is considering the use of diesel engines in carrier route vehicles (CRV) because of the improved fuel economy and decreased maintenance requirements associated with diesel.
- Vehicle has shown fuel economy improvement up to 30% over gasoline CRV's.





Alternative Fuel Program Fuel Cell Vehicle

- Two year agreement with General Motors to test a GM's fuel cell minivan in Washington DC area.
- Evaluate the fuel cell technology and potential benefits for fuel economy, emission.
- Being used for mail delivery in Fort Belvoir, VA daily since September 2004.





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