

Electric Vehicles in the Postal Service

At the turn of the twentieth century, the production of automobiles in the United States was divided almost equally among electric-, steam-, and gasoline-powered models. The Post Office Department tried all three types for mail collection in cities. Although more expensive than horse-drawn vehicles, motor vehicles were able to cover the same distance in less than half the time and were gradually adopted by mail transportation contractors.

First Tested in 1899

The first known test of an electric vehicle for mail collection was in Buffalo, New York, on July 2, 1899, when Buffalo's superintendent of city delivery, driven by an electric car promoter in his Columbia automobile, collected mail from 40 boxes in an hour and a half – less than half the time it took with a horse-drawn wagon.

In December 1899, a Winton electric automobile was tested for mail collection in Cleveland, Ohio. The letter carrier collected mail from 126 boxes along a 22-mile route in two hours and 26 minutes, during a snowstorm. With a horse and wagon, it usually took six hours.

In 1900, Postmaster Freeman Dickerson tested automobiles in Detroit, Michigan. An electric model by the Wood Motor Company was tested on January 10, 1900, for carrying mail between the main Post Office and its stations. On February 14, a gasoline-powered model by the Detroit Automobile Company was tested on the same routes. Both vehicles were more than twice as fast as horse-drawn wagons, although the gasoline-powered automobile was slightly faster. Dickerson informed Second Assistant Postmaster General William Shallenberger that in his opinion “an automobile operated by gasoline will be far preferable” for carrying mail, as it would not have to spend equal hours out of service, recharging.¹

In Washington, D.C., two Riker electric mail wagons were being used by August, 1900. The Riker Motor Vehicle Company of Elizabethport, New Jersey, designed the vehicle specifically for postal use. It weighed 1,800 pounds and could carry 200 pounds in addition to its operator. On one charge, it could travel 25 miles at 12 miles per hour.

The first known contracts for mail transportation by automobile were for electric models:

–In March 1901, the Post Office Department contracted with the Electric Vehicle Company of New York for the transportation of mail between the Buffalo Post Office and a temporary postal station at the nearby Pan-American Exhibition, which ran from May through October 1901.



Winton Electric Automobile, 1899

In December 1899, a letter carrier tested a Winton electric automobile for mail collection in Cleveland, Ohio.

(pictured in *The Automobile*, January 1900)



Riker Electric Mail Wagon, 1900

Two Riker electric mail wagons were being used in Washington, D.C., by August 1900.

(pictured in *The Automobile*, August 1900)



Columbia Electric Delivery Wagon, 1901

A Columbia Mark XI electric delivery wagon, built by the Electric Vehicle Company of New York, transported mail between the Buffalo Post Office and a temporary postal station at the nearby Pan-American Exhibition from May through October 1901. It could carry 1,000 pounds besides the driver and letter carrier and was able to travel 40 miles on one charge.

¹ Dickerson to Shallenberger, January 31, 1900, "Records of the Division of Motor Vehicle Service," Record Group 28, National Archives and Records Administration. Vehicles on some city routes spent 12 hours a day or more in service.

–In October 1901, the Department contracted with the Republic Motor Vehicle Company for five electric vehicles, with operators, to collect mail from boxes in Minneapolis and to carry mail between the Minneapolis Post Office and its stations from January 1, 1902, to June 30, 1903.

Some rural mail carriers, who supplied their own vehicles, also used electric models. According to an article in the May 9, 1909, issue of *The New York Times*, a rural carrier in Manchester, New Hampshire, used his Waverley electric automobile to deliver mail during the warmer months of the year beginning in 1905.

In 1909, electric mail trucks were put in service in New York City and Boston. During the 1911 Christmas season, New York's electric vehicles operated night and day, with batteries and drivers changing every eight hours.²

There were hundreds of car companies nationwide, and mail contractors often used cars of local manufacture.³ For example, in the mid-1910s, an electric automobile made by the Argo Electric Vehicle Company of Saginaw, Michigan, was used by the Saginaw Post Office. In 1916, an electric mail truck built by the Walker Vehicle Company of Chicago was used in Chicago.

Parcel Post service, which began in 1913, increased the need for motor vehicles because more and heavier packages began entering the mailstream. *Harper's Weekly* opined that “under the most ordinary conditions, one motor vehicle can do the work of three horse-drawn wagons.”⁴ In 1913, the Post Office Department purchased 41 vehicles to test in 10 cities, to see if owning motor vehicles was cheaper than leasing them. After a thorough comparison, the Department decided in favor of ownership in some cities. In 1914, government-owned and -operated motor vehicle service began in Washington, D.C., and was gradually introduced to other cities. The Department used gasoline-powered vehicles, in part because electric vehicles lacked sufficient speed and power.⁵ In 1915, William H. Haycock, superintendent of mails in Washington, D.C., told the Electric Vehicle Association

*if machines of the electric type can be built with sufficient speed and hill-climbing qualities to meet the requirements of the collection service they would undoubtedly be found to be particularly desirable . . . the fact that electric machines are so much more simple of operation and can be easily driven by carriers, without the extra cost of chauffeurs . . . is a decided advantage in their favor.*⁶

Although electric vehicles held on in the commercial market longer than in the passenger market, production gradually shifted to gasoline-powered models. In 1914, in New York – the state with the most registered vehicles – electric vehicles accounted for about 6 percent of passenger cars and 29 percent of commercial vehicles.⁷ By 1917, however, nearly all of the commercial vehicles manufactured in the U.S. were gasoline models.⁸

Electric Vehicles, 1950s–1980s

The Post Office Department began to motorize city delivery routes in the 1950s in response to unprecedented suburban growth and soon began to experiment with electric vehicles in its quest for efficient, cost-effective delivery vehicles. The earliest city delivery vehicles consisted of Jeeps, sit-stand trucks, and three-wheeled mailsters.

² *The Commercial Vehicle*, February 1912, 76.

³ Gasoline- and steam-powered automobiles were also used. In his book *Motorized Mail*, Jim Bruns pictures gasoline-powered automobiles used in Baltimore and a steam-powered model used in Boston in 1906 (James H. Bruns, *Motorized Mail*, Krause Publications, Iola, WI, 1997, 78-79).

⁴ *Harper's Weekly*, December 7, 1912.

⁵ Detailed cost analyses of vehicle ownership included the costs of oil and gas. See, for example, the *Annual Report of the Postmaster General*, 1916, 124, and 1917, 102-104.

⁶ *The New York Times*, February 7, 1915.

⁷ *The Automobile*, March 19, 1914; 631. Less than two percent of New York's commercial electric vehicles were used by the Post Office (*The Automobile*, January 21, 1915; 127).

⁸ Of the 1917 models listed in the November 2, 1916, issue of *The Automobile*, 200 of 211 were gas-powered. The 11 non-gas-powered models included nine electric and two steam-powered vehicles. In his book *Taking Charge - The Electric Automobile in America*, Michael Brian Schiffer offers several explanations for the eventual dominance of gasoline-powered vehicles in the early 1900s: gasoline was more readily available than electricity; electric vehicles, which were heavier due to their large batteries, had a tougher time on the era's rough roads; and perhaps most importantly, Henry Ford's successful mass-production of gasoline-powered vehicles skewed the industry in their favor.

In 1959, the Post Office Department began testing 13 electric mailsters in Miami and Houston, and in 1961 ordered 300 electric mailsters from Highway Products Company, for use in Florida. Although most of these were still in service as of December 1964, they accounted for only about two percent of the mailster fleet (298 of 13,754 vehicles). They did not accelerate as well as the gas-powered models and could travel only about half as fast, at about 16 rather than 35 miles per hour (mph). The Department began phasing out mailsters altogether in 1967, and by the early 1970s they had largely been replaced by Jeeps.

Prompted both by oil embargoes and environmental concerns, the Postal Service tested electric vehicles again in the early 1970s, including:

- an Otis Electric Delivery Vehicle, at Santa Ana, California;
- Batronic Truck Corporation vehicles, at Bethlehem and Allentown, Pennsylvania;
- an Electromotion, Inc., vehicle, in Lowell, Massachusetts; and
- a Harbilt electric vehicle, at Cupertino, California.

Frank Sommerkamp, the Postal Service's director of delivery services, enthused in 1973 that the tests "could result within several years in our replacing conventional mail delivery trucks [with electric vehicles] at the rate of 5,000 per year."⁹ (In 1973, the delivery fleet numbered about 99,000.) Although this did not happen, the successful performance of the Harbilt electric vehicle resulted in the Cupertino Post Office switching its entire fleet to about 30 of the vehicles in 1973. The Harbilt electric vehicles, which could travel at about 30 mph and had about one-fourth the power of gasoline-powered Jeeps, were used at the Cupertino Post Office through 1982.

Jeeps were the principal delivery vehicle in the 1970s and 1980s. In 1974, the Postal Service ordered 350 electric Jeeps from American Motors Corporation. Delivery of these DJ-5Es, also called "Electrucks," began in 1975 – with the first 10 trucks placed in service in Evansville, Indiana, that July – and was completed in early 1976. Congressman Philip Hayes of Indiana commended the Postal Service's "laudable experiment . . . in the field of energy conservation and pollution control."¹⁰ The Jeep's top speed was about 33 mph. With 300 stops and starts it had a 29-mile range per 8-hour charge although it lost power in cold weather and had to avoid hilly routes. The electric Jeeps cost about twice as much as regular ones, but were expected to be about 10 percent cheaper over their projected 10-year life due to reduced fuel costs. Most of the electric Jeeps were eliminated from the delivery fleet in 1983.

In 1980, the Postal Service ordered 375 futuristic-looking electric delivery vehicles from Commuter Vehicles, Inc., of Sebring, Florida, with plans to buy more in succeeding years. Two hundred and thirty-one of the vehicles were delivered to Post Offices in South Florida in 1981, but motor failures and a dispute with the company over warranty terms grounded the fleet less than a year later. The vehicles were left parked during a legal dispute with the company over contract terms, and the remaining vehicles ordered were never delivered.



Harbilt Step Van, 1970s

This prototype British-built Harbilt truck was first tested at Cupertino, California, in 1971. It was still in service as of January 1982.



Harbilt Step Van, 1978

In the 1970s, the entire fleet of about 30 trucks at the Cupertino, California, Post Office was converted to electric Harbilts. They were among the first postal vehicles to sport the all-white color scheme, which was officially adopted in January 1979.



AMC Electric Jeeps ("Electrucks"), 1978

Eighty electric quarter-ton Jeeps were used on 73 routes in Torrance, California, in the late 1970s. They were part of a group of 350 electric trucks ordered from American Motors Corporation in 1974.

⁹ *Wall Street Journal*, October 3, 1973; 27.

¹⁰ *Congressional Record – Extensions of Remarks*, September 8, 1975; E4565.

Several other electric vehicles were tested for mail delivery beginning in 1981, including:

- ten Jet Industries' Electricas, based on the Ford Fiesta, in Austin, Texas;
- ten Grumman Kurbwatt vans in Evansville, Indiana; and
- ten Marathon C-360 vans in Alexandria, Virginia.

The successful performance of the Kurbwatt vans led to the purchase of 31 of the vehicles for use at the Cupertino, California, Post Office beginning in 1984. The Kurbwatts, which used 14 golf cart batteries to achieve a reported 40-mile-per-charge range, were used at Cupertino through 1988.

Electric Vehicles Since the 1990s

The Energy Policy Act of 1992 directed federal agencies to add alternative-fuel vehicles to their fleets in increasing numbers beginning in 1996. Beginning in the early 1990s, the Postal Service experimented with a number of electric vehicles – primarily in California, where state law mandated the production of zero-emission vehicles in the 1990s.¹¹

Ford Ecostars, 1993-1998

From 1993 to 1998, the Postal Service leased six Ecostar vans from the Ford Motor Company, in cooperation with the Los Angeles-area utility company Southern California Edison, for use at Huntington Beach, California. These were the first electric vehicles used by the Postal Service with a driving range that was extended through the use of regenerative braking. Although the Ecostars performed well, concerns raised by Ford of catastrophic battery failure ended their evaluation as delivery vehicles.

GM Hughes/U.S. Electricar Electric LLVs, 1995-2000

Long-life vehicles (LLVs) — longer lasting, lighter, and roomier than Jeeps — were introduced in 1987. In 1995, the Postal Service began testing six GM Hughes/U.S. Electricar electric LLVs in Harbor City, California, and Merrifield, Virginia. In 1997, two more electric LLVs were put in service at Westminster, California. In March 1999, another two electric LLVs were delivered to Westminster; these were transferred to Harbor City in September 1999. The vehicles were taken out of service by the end of 2000 at the request of General Motors, which cancelled its electric vehicle program.

Solectria/Azure CitiVans, 1998-Present

In June 1998, the Postal Service began testing two 2-ton Solectria CitiVans owned by the New York Power Authority for deliveries and pickups in Manhattan. In 2001, the Postal Service purchased twenty CitiVans for use in Manhattan. In 2004, eight CitiVans were put in service in the Bronx, and in 2005, two were placed in service in Queens; all ten of these vehicles were donated to the Postal Service by the New York Power Authority. By using electric trucks rather than diesel trucks, the Postal Service helped reduce emissions in New York City.



Commuter Vehicles Electric Vehicle, 1980
Mechanical failures and a dispute over warranty terms grounded a fleet of 231 electric vehicles purchased from Commuter Vehicles, Inc., soon after the vehicles went into service in South Florida in 1980-81.



Ford Ecostar, 1996
Six Ford Ecostar vans were tested for mail delivery in California in the 1990s, including the one pictured above in Huntington Beach.



GM Hughes/U.S. Electricar LLV, 1995
Ten GM Hughes/U.S. Electricar electric LLVs were tested for mail delivery in California and Virginia in the late 1990s, including the one pictured above in Harbor City, California.

¹¹ In 1990, the California Air Resources Board instituted the Zero Emission Vehicle (ZEV) Mandate, which required that two percent of the sales of all but the smallest carmakers consist of emission-free vehicles by 1998, to rise to 10 percent by 2003. Although these requirements were later dropped, they led to a flurry of research and development by the auto industry, as well as the production of several thousand electric vehicles. Most of these vehicles were available from the manufacturers for lease only.

Daimler-Chrysler EPICs, 1999-2001

In September 1999, twelve electric minivans made by Daimler-Chrysler were added to the delivery fleet of the Harbor City, California, Post Office. A \$60,000 grant from the Department of Energy helped offset the added cost of leasing the vehicles. Together with five electric LLVs, the electric minivans, called EPICs (Electric Powered Interurban Commuters), comprised the Harbor City Post Office's entire delivery fleet for a short time, making it the first Post Office to have an all-electric fleet since the Cupertino Post Office in the 1970s. The EPIC minivans, based on the Dodge Caravan/Plymouth Voyager, could reportedly go 80 to 90 miles between charges. Although they performed well and were well-liked by letter carriers, the EPICs were returned to Daimler-Chrysler in 2001 at the end of their three-year lease at the request of the company.



Daimler-Chrysler EPIC, 1999
An EPIC charged up at the Harbor City, California, Post Office. Letter carriers praised the vehicles for their quiet, efficient operation.

Ford Electric Trucks, 2000-2003

In December 1999, the Postal Service ordered 500 electric right-hand drive mail delivery vehicles based on the Ford Ranger from the Ford Motor Company in partnership with Baker Electromotive of Rome, New York – the largest single order of electric vehicles in U.S. history. Most of the vehicles – about 480 – were used in California, with the remainder used in Washington, D.C., and White Plains, New York. Fifteen groups, including the California Energy Commission, the U.S. Department of Energy, local air quality management districts, utilities, and state agencies, partnered together to pay for the extra cost of the vehicles, which cost about twice as much as gasoline-powered models (\$42,000 vs. about \$22,000). The first two vehicles were field-tested at the Fountain Valley, California, Post Office beginning in July 2000; most of the vehicles were deployed from March 2001 to March 2002.¹²

In October 2002, Ford advised the Postal Service that it was cancelling its electric vehicle program and that the producer of the vehicles' battery pack, East Penn Manufacturing Company, Inc., was planning to end production. Ford suggested that the Postal Service could purchase replacement batteries for its vehicles in advance and hold them in cold storage for the future. Rather than face the prospect of unknown numbers of battery replacements over the life of the vehicles – the original estimate of a three- to five-year battery life had been revised downward to about two – the Postal Service returned the vehicles in August 2003 to the Ford Motor Company in exchange for gas-powered Windstars.¹³

Navistar eStars, 2011-2013

From December 2011 to July 2013, the Postal Service tested 10 Navistar eStar 2-ton electric step vans. The tests were funded by the U.S. Department of Energy with money from the American Recovery and Reinvestment Act of 2009. The vehicles were field-tested in Los Angeles, California; Manhattan, New York; and Fairfax, Virginia. The vehicles could go 100 miles on one charge and could fully recharge in 6 to 8 hours. They were returned to Navistar in July 2013, following the company's decision to stop supporting the vehicles.

Electric LLVs, 2011-Present

In 2009, the Postal Service awarded contracts to five electric vehicle suppliers to retrofit five gasoline-powered LLVs with electric drive trains. The five companies selected were: Autoport/AC Propulsion/University of Delaware; Bright Automotive; EDAG, Inc.; Quantum Technologies; and ZAP.



Navistar eStar, 2013
Ten Navistar eStars were tested from 2011 to 2013, including the one pictured above in Fairfax, Virginia.

¹² For more information, see "United States Postal Service Electric Carrier Route Vehicle Program, 500 Vehicle Fleet Deployment Report: Executive Summary," by Ryerson, Master and Associates, Inc. (May 2003), at http://www1.eere.energy.gov/vehiclesandfuels/avta/pdfs/fsev/usps/fleet/2summarysections1_3.pdf.

¹³ Other factors that influenced the Postal Service's decision to exchange the vehicles were: the Ford EV's limited range, water pump and wiring harness problems, the cost and uncertain success of long-term battery storage, and the uncertainty of successfully maintaining the vehicles after their warranty period.

The Postal Service gave each company \$50,000 to convert the vehicles to electric-powered using distinct technology. Beginning in 2011, all five eLLVs were tested on mail delivery routes in the Washington, D.C., metropolitan area. As of March 2014, only the Autoport eLLV was still in service, although the ZAP eLLV was due to return to service following the replacement of its battery system.

Light-Duty Vehicles, 2002-Present

The Postal Service has also tested electric light-duty vehicles for city delivery, hoping to add to its fleet of cost-effective, environmentally friendly alternatives to gasoline-powered vehicles.

In 2002, the Postal Service began testing the two-wheeled Segway for mail delivery, but ended its evaluation after a few years. The Segway could not go the distance on one charge, did not have adequate storage capacity, and its lack of suspension made for rough rides.

In October 2008, letter carriers began testing three-wheeled T3s in Florida, California, and Arizona. The T3s were equipped with a small trailer that added to its storage capacity and had a reported 40-mile range per charge. Thirteen of the test vehicles were still in use in 2014, but no further vehicles were purchased due to the vehicles' vulnerability to weather and 5 mph maximum speed limit.

Beginning in 2011, three Neighborhood Electric Vehicles (NEVs) were tested for mail delivery in Alexandria, Virginia – one from e-Ride Industries and two from Vantage Vehicle International, Inc. The vehicles were limited to roads with speed limits at or below 25 MPH, limiting their usefulness for mail delivery. The tests ended in 2012.

Although electric vehicles represented only a small fraction of the Postal Service's delivery fleet in 2013, together with other types of alternative-fuel vehicles they numbered more than 42,500, comprising about 20 percent of the fleet and representing the largest civilian fleet of alternative fuel-capable vehicles in the world.¹⁴



Autoport eLLV, 2013

Beginning in 2011, five eLLVs were tested on mail delivery routes in the Washington, D.C., metropolitan area, including the Autoport eLLV pictured above.



Segway, 2004



T3, 2010



e-Ride NEV, 2011

HISTORIAN
UNITED STATES POSTAL SERVICE
APRIL 2014

¹⁴ In 2013, 42,568 of 208,807 vehicles in the Postal Service's fleet were alternatively-fueled (data as reported to FAST, the Federal Automotive Statistical Tool, at <https://fastweb.inel.gov/index.htm>, as of January 8, 2014). Of the total number of alternative-fuel vehicles, 40,979 consisted of flexible-fuel E85 models, capable of running on either gasoline or ethanol-based fuel.