



City of Portland Green Purchasing Case Study

Electric Vehicles

Purchasing Green

Spurred by a City Council mandate requiring that 20 percent of the City's fleet (a total of 600 vehicles, including scooters and fork lifts) be electric by 2030, CityFleet began replacing gasoline powered passenger sedan vehicles with all-electric Nissan LEAFs in August 2011. The City had been contemplating a move toward greener vehicles for some time, and the City Council directive gave CityFleet credibility to proceed with the upgrade as vehicles were retired.

As part of a national movement, the Portland metropolitan area was one of five target markets in the U.S. identified by Nissan in 2011 to test the implementation of electric vehicles (EVs) and EV charging stations. Federal grants covered the costs to install the EV charging stations throughout the metropolitan area. These external initiatives also supported CityFleet's move towards EVs, such that at time of publication, there are 11 Nissan LEAFs in use among City departments.

Benefits

EVs are often confused with hybrid vehicles, which run on a combination of a gasoline engine and electric motor. EVs are gasoline-free vehicles, and as such, have no mufflers, no transmission, no fuel tank systems, and no tailpipe emissions.

The LEAFs can travel up to 80 miles per charge, and according to Nissan, the 2011 LEAFs have 120 miles per gallon equivalent (MPGe) – meaning for every gallon of gas that a conventional car burns, the LEAFs could go 120 miles for the same amount of energy expended.

LEAFs also generate less maintenance waste than gasoline powered vehicles since they do not require engine or transmission oil changes, meaning there are no waste oils and associated filters to dispose of. The batteries are recyclable at the end of their useful lives, which is estimated to be a minimum of 10 years, according to the manufacturer. The City's experience with other battery-powered hybrid vehicles has demonstrated that these types of batteries tend to outlast the manufacturer's suggested life span.

Cost

Traditional gasoline sedans used in the City's fleet had an average purchase price of around \$14,000 per vehicle. By comparison, the Nissan LEAFs were considerably more expensive, running upwards of \$36,000, including the costs of decals and charging stations. Federal grants covered up to \$1,500 per charging station; actual costs to install charging stations varied between \$1,000 and \$2,500 depending on the location of the stations and nearby power supplies.



CityFleet's new Nissan LEAFs have an 120 miles per gallon equivalent (MPGe) rating.

At a glance –

Who –

- CityFleet

Product –

- 2011 Nissan LEAFs

Cost –

- \$36,000 purchase price;
\$0.06/mile to operate

Benefits –

- Zero emissions
- Fewer maintenance requirements
- 8 year return on investment

“The electric vehicles have proven to be a great addition to the fleet and we look forward to expanding their use in the City.”

Don DePiero,
Vehicle Maintenance Superintendent,
CityFleet

Costs to operate the EVs however, are much less when compared to gasoline sedans. On average, the City estimates the Nissan LEAFs cost \$0.06/mile to run versus \$0.28/mile to operate gasoline sedans. In comparison to regular automobile engines, EV engines have fewer parts and fewer moving parts, which can translate to fewer visits to a garage for repairs over the life of the car.

CityFleet used fuelconomy.gov to calculate return on investment, a valuable tool that was instrumental in determining whether purchasing EVs made economic sense for the City. On average, the City expects to see an eight-year return on investment with the LEAFs and anticipates keeping the LEAFs in the City's fleet upwards of 10 years.

Performance

The City has had no issues with operating the LEAFs and the only complaint noted was “range anxiety” from first time users. Because the LEAFs require special charging stations that charge at 208/240 volts (as opposed to the more common 110 electrical systems), drivers were concerned that they would run out of “juice” before they were able to get where they were going and not be able to recharge the cars if necessary. Despite drivers' concern, there have been no reported issues of drivers going out of range since the “fuel” gauge measures how many miles the car is able to drive until its next charge is needed.

Initially, there were some issues with the software programming in the charging stations, which was quickly rectified by Ecotality.

Overall, CityFleet has been very pleased with the performance of the LEAFs, and with EVs in general, and plans to expand the use of EVs in their fleet as more passenger sedans are retired.

Lessons Learned

The City recommends to other communities considering making the move to EVs that they have a plan in place to ensure both the vehicles and charging stations are ready to go at the same time. At the very least, make sure the charging station infrastructure is in place before the vehicles are added into their fleets.

■ November 2013)

About CityFleet

CityFleet's seven repair facilities maintain Portland's 2,950 vehicles and equipment. This includes parking patrol vehicles, sedans, pick-ups, vans, police sedans, dump trucks, back hoes, and heavy construction equipment. They perform oil, lube, and filter changes; DEQ emission inspections; and engine, transmission, drive train, electrical, suspension, heating, cooling, and air conditioning diagnoses and repairs. CityFleet garages are also certified Eco-Biz Automotive Shops, a designation that recognizes their commitment to minimizing their environmental impacts. CityFleet was also named as one of the Top Elite Fleets by Government Fleet Magazine in 2011 and 2012, after being named #1 Fleet in 2010.

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