

A stylized background illustration featuring a grey road with white dashed lines curving across a light green landscape. A yellow sun is positioned behind a light blue map outline of a state, which is partially obscured by the road. The overall style is clean and modern.

Which Alt Fuel(s) Will Work for Your Fleet and Why: A Municipal Perspective



Elmhurst's Fleet Composition

The City's fleet is comprised of 191 vehicles that range from compact passenger sedans to the tower ladder truck.

- 34 Propane/Bi-Fuel
- 69 B20 Biodiesel
- 13 Hybrid Electric
- 9 Battery Electric Vehicles

59% of the fleet runs on alternative fuels.



Commitment to Sustainability

Elmhurst signed the U.S. Mayors Climate Protection Agreement in 2007. In the years since making that important pledge, City leadership decided that a custom-tailored plan with strategies to guide local actions would further strengthen the City's commitment to sustainability.

In 2014, a Sustainability Task Force was formed to provide input for development of such a plan. The Task Force was comprised of volunteers from various backgrounds and stakeholder groups.

The Task Force identified promoting Alternative Fuel Vehicles when cost effective. The plan included the Public Works fleet utilizing biodiesel and other sustainable forms of fuel to the greatest extent possible. Also, the plan stated that electric/gasoline hybrid vehicles would be added to the fleet where possible to further reduce carbon dioxide and minimize the consumption of fossil fuels.



Biodiesel

The City began using B20, and became a member of the B20 club in 2015.

As of today, 72 assets use biodiesel. Including 3 diesel hybrid aerial trucks.

Last year, the City fleet used 44,807 gallons of biodiesel.



Biodiesel, lessons learned...

Some failures of fuel system components not rated for biodiesel. These failures primarily occurred with older equipment in the fleet.

Fuel leaks from non-biodiesel rated hoses and couplers.

Algae growth in fuel cells of equipment that was seasonally sedentary.

Engine component coking. Engine coking remains an issue with equipment that has low temperature and high idle time.



Biodiesel, solutions...

- 1) The formulation of specific biodiesel fuel specification -

Summer Blend : No2 Ultra Low Sulfur Diesel with 15 PPM Sulfur content meeting ASTD-975. Blend 20% virgin Soy based Biodiesel meeting ASTM D-6751 and meets registration BQ9000 fuel quality program.

Winter Blend: 50% No.1 and 50% No2 Ultra Low Sulfur Diesel with 15 PPM Sulfur content meeting ASTD-975. Blend 20% virgin Soy based Biodiesel meeting ASTM D-6751 and meets registration BQ9000 fuel quality program.

- 1) Biannual fuel analysis from the City's underground storage tanks.
- 2) Adjusting biodiesel percentage levels seasonally.
- 3) A significant increase of fuel filter replacement and dissection during routine maintenance.
- 4) Continual monitoring of soot loads within particulate filters and forcing re-gens to manage by individual use of equipment NOT by interval fleet wide.
- 5) Televised inspections and cleaning of items such as mixing ducts and EGR coolers and passages.



Propane/Bi-fuel

The City's sustainability efforts took another step in late 2017. At that time, the City began converting trucks to bi-fuel propane/gasoline powered vehicles with the conversion of 6 trucks.

Today, Elmhurst has 34 propane-powered vehicles.

In 2023, the City fleet consumed 15,054 gallons of propane.



Propane/Bi-fuel, lessons learned...

Can be costly to install without grant assistance.

Operator training & “buy in”: Users need to be trained repeatedly! Although filling the trucks with propane is identical to filling with gasoline they were apprehensive at first.

Operators needed a lot of assurance that their trucks won't release propane! They won't! There are several redundancies to prevent release. In most cases, a check valve activates and stops the flow of propane instantly.

Dispensing in temperatures below 25 degrees is slower than normal.

No matter how trouble free the system is. It's another system added that requires attention.



Propane/Bi-fuel, advantages...

The cost of the product! (Per purchasing contract) Propane is considerably cheaper. One gallon of propane is \$1.97. A gallon of gasoline is \$3.46.

A decreased emissions footprint when compared to gasoline or diesel.

The cost for a conversion closely parallels the diesel engine option cost on a 1-ton truck.

Increased service intervals for oil changes.

If specified correctly, the entire system (including the fuel cell) takes up minimal space.

They operate as safely as a gasoline powered vehicle.

Offers some operational redundancy.



In summary...

No one alternative fuel was better than the other singularly. Our success was found by carefully analyzing fuel use data on outgoing assets, changing their assignments to maximize an off set of fuels used based on consumption.

When that was done, diesel fuel consumption dropped significantly, gasoline did too but not as dramatically.

Don't expect to see savings immediately!

Put the sustainability aspect of your decisions first! Both the benefits and return on investment should be framed within that assets' lifespan, not months or even a year.



In summary...

Sustainability efforts will continue to increase. Choose carefully within an evolving industry. Don't jump in with both feet.

Use the “Hat Trick” philosophy with decision makers in your organization.

1. How environmentally beneficial will this asset be to your organization in its service life and how long will its life be?
2. Can the inbound asset (at minimum) perform equally to the outbound one?
3. Will it show a financial benefit to your organization? If not, does the environmental benefit outweigh the financial advantage?

