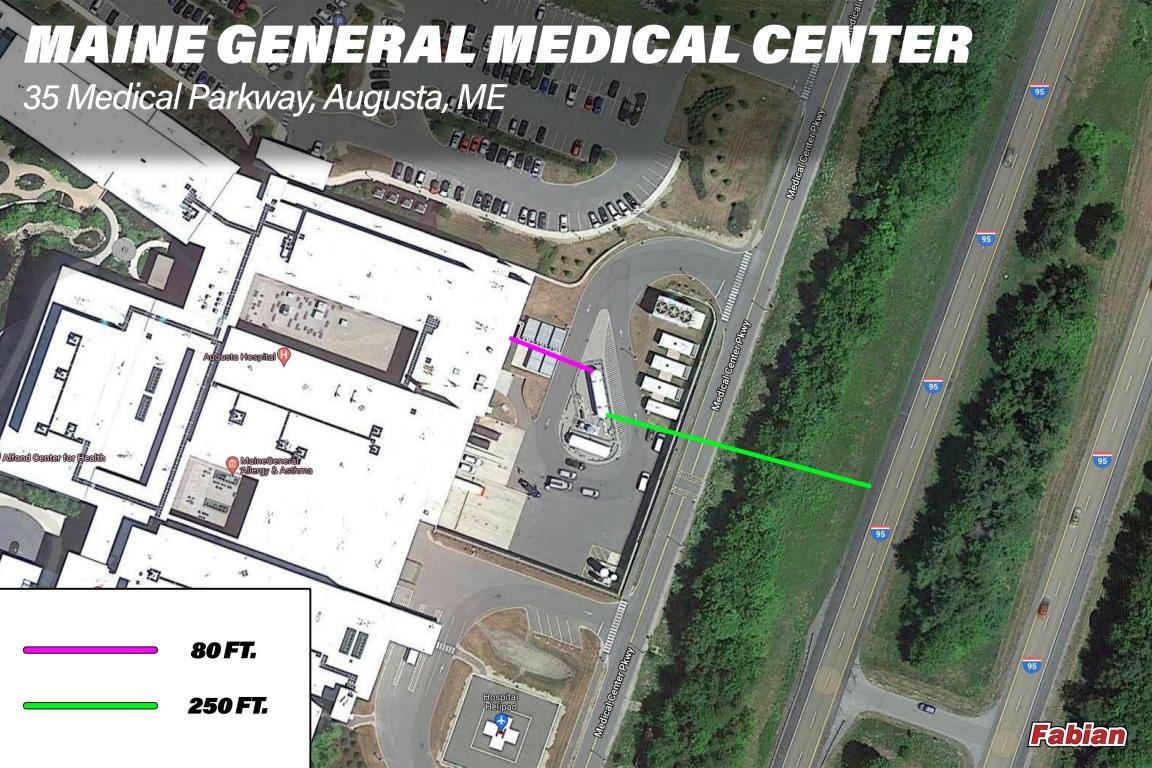


1120 Sokokis Trail, North Waterboro, ME - Propane Tank Install Proposal Hillel Weisel - Project Manager | Hillel.weisel@fabianoil.com

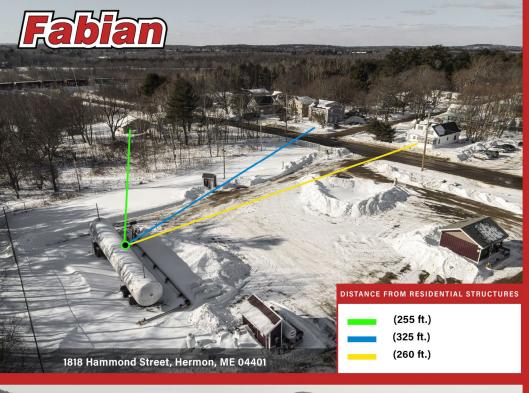


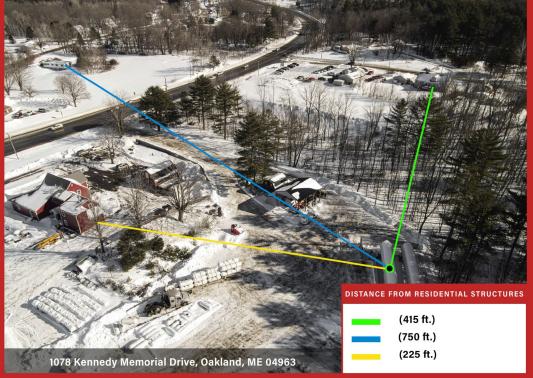






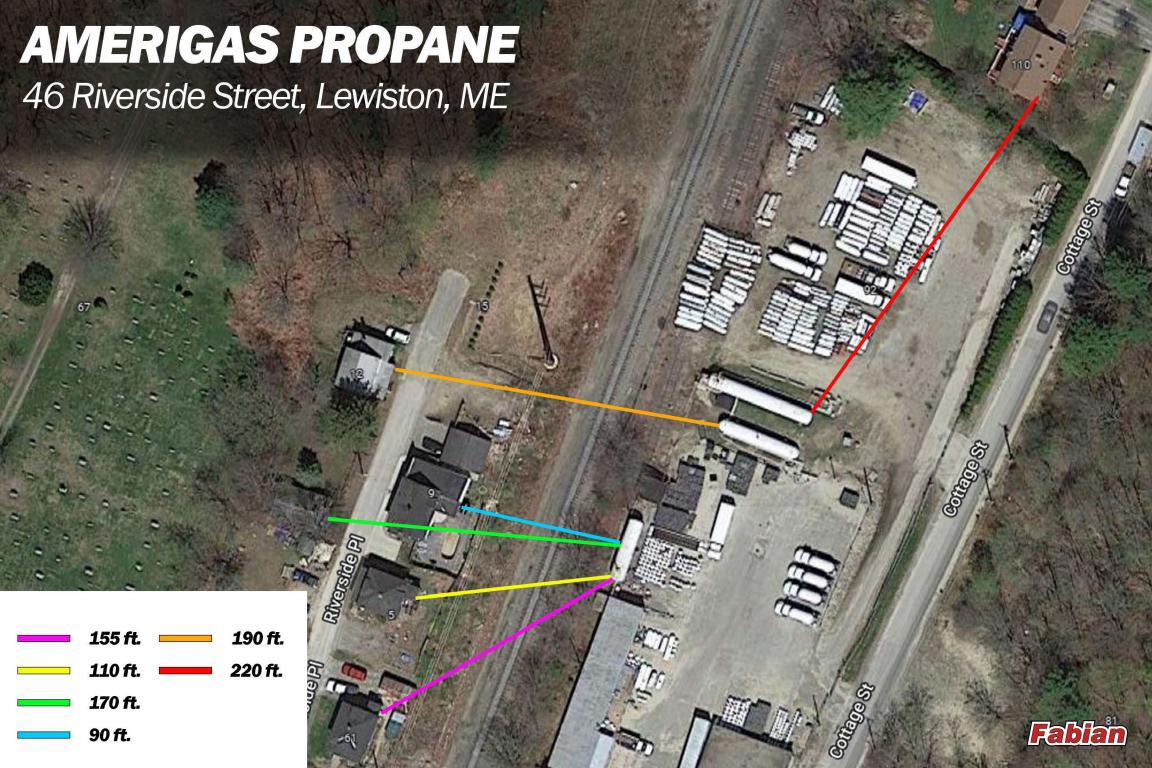


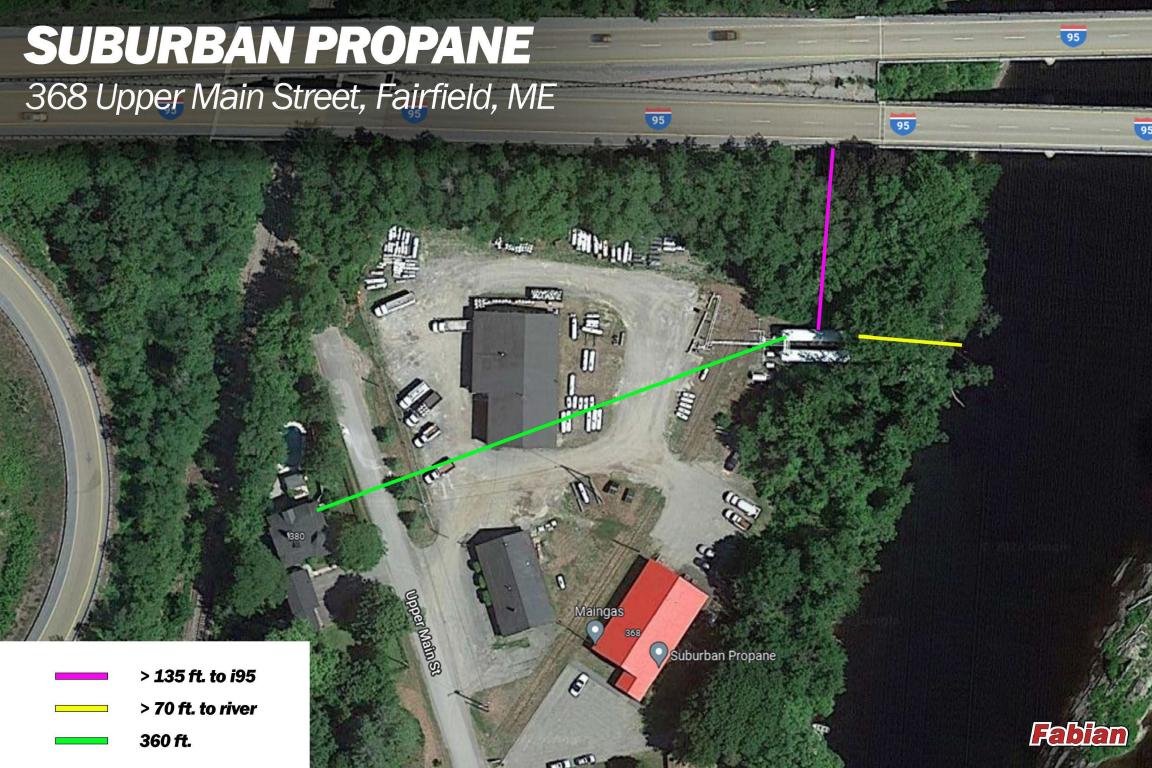


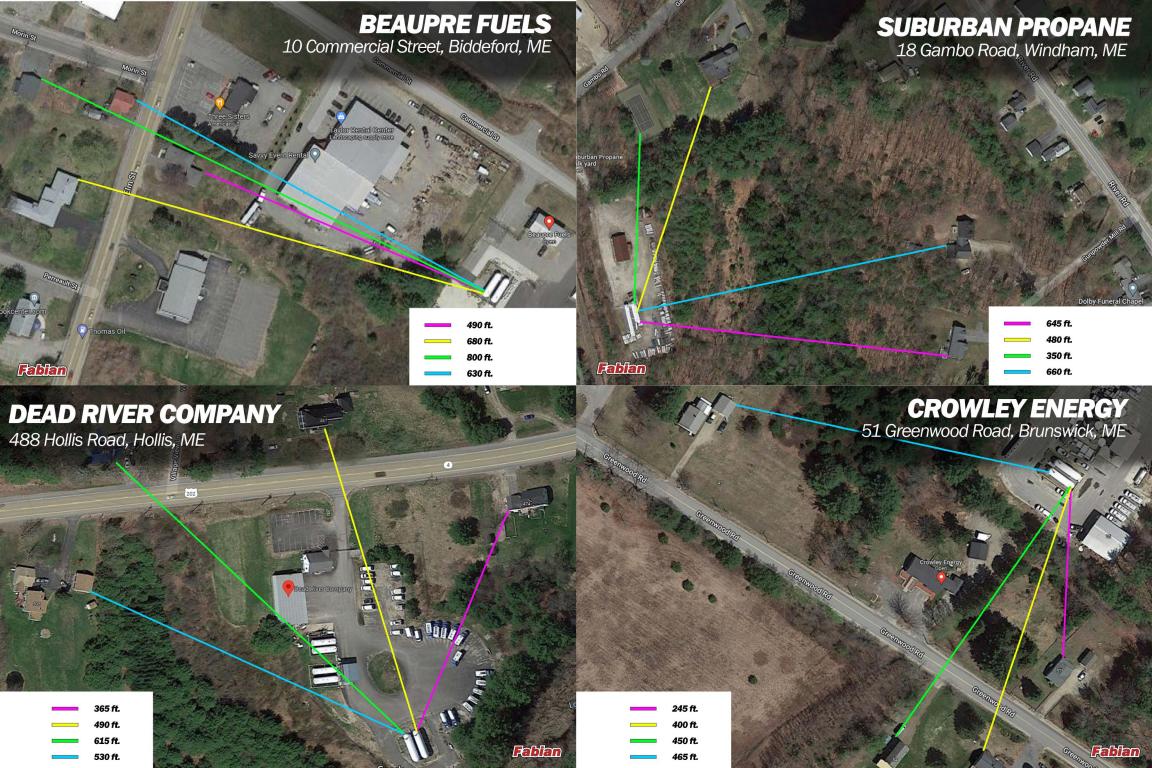


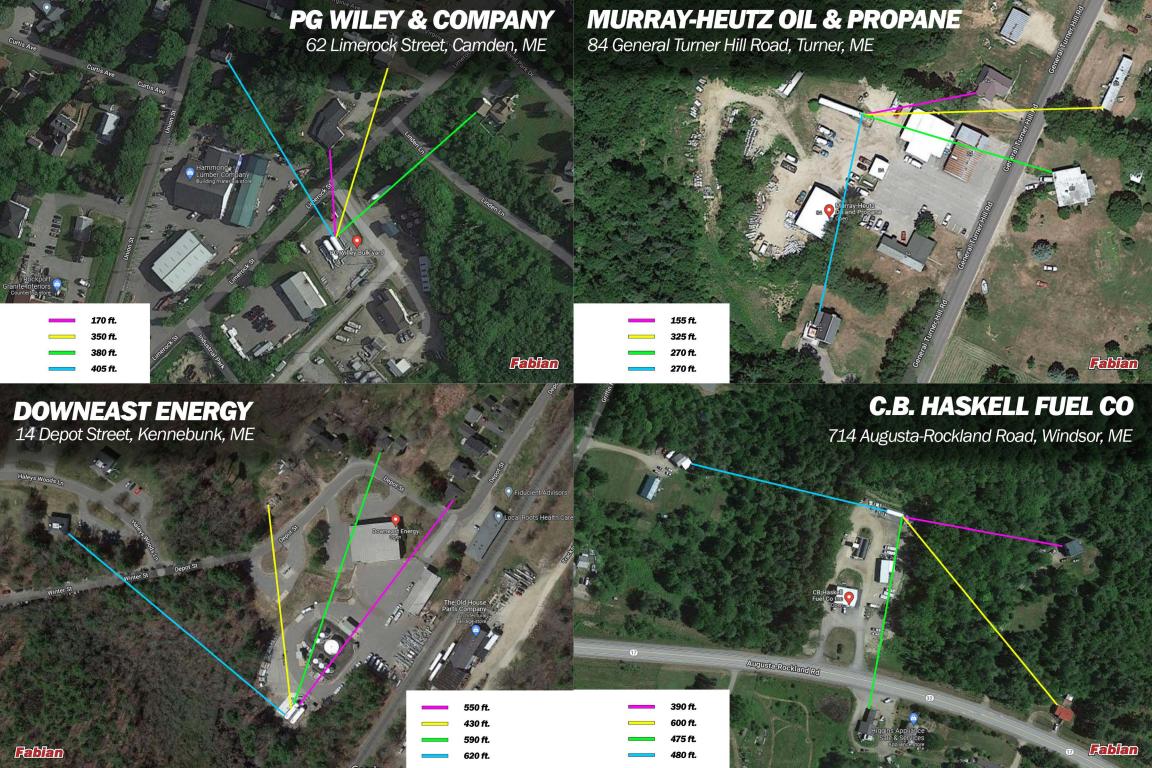












U.S. Department of Energy - Energy Efficiency and Renewable Energy Alternative Fuels Data Center

Propane Fuel Basics

Also known as liquefied petroleum gas (LPG) or propane autogas, propane is a clean-burning alternative fuel that's been used for decades to power light-, medium-, and heavy-duty propane vehicles.

Propane is a three-carbon alkane gas (C H). It is stored under pressure inside a tank as a colorless, odorless liquid. As pressure is released, the liquid propane vaporizes and turns into gas that is used in combustion. An odorant, ethyl mercaptan, is added for leak detection.

Propane has a high octane rating, making it an excellent choice for spark-ignited internal combustion engines. If spilled or released from a vehicle, it presents no threat to soil, surface water, or groundwater. Propane is produced as a by-product of natural gas processing and crude oil refining. It accounts for about 2% of the energy used in the United States. Of that, less than 3% is used for transportation. Its main uses include home and water heating, cooking and refrigerating food, clothes drying, and powering farm and industrial equipment. The chemical industry also uses propane as a raw material for making plastics and other compounds.



Propane as an Alternative Fuel

Interest in propane as an alternative transportation fuel stems from its domestic availability, high-energy density, clean-burning qualities, and relatively low cost. It is the world's third most common transportation fuel, behind gasoline and diesel, and is considered an alternative fuel under the Energy Policy Act of 1992.

Propane used in vehicles is specified as HD-5 propane and is a mixture of propane with smaller amounts of other gases. According to the Gas Processors Association's HD-5 specification for propane, it must consist of at least 90% propane, no more than 5% propylene, and 5% other gases, primarily butane and butylene.

For vehicle fueling, the quick-release "Type K15" dispenser connector is required to be installed on all new vehicles beginning January 1, 2020, per National Fire Protection Association Code 58. This connector allows for one-handed fueling and does not require the use of personal protective equipment such as gloves and face shield (which are required for the older style connector).

Propane is stored onboard a vehicle in a tank pressurized to about 150 pounds per square inch—about twice the pressure of an inflated truck tire. Under this pressure, propane becomes a liquid with an energy density 270 times greater than its gaseous form. Propane has a higher octane rating than gasoline, so it can be used with higher engine compression ratios and is more resistant to engine knocking. However, it has a lower British thermal unit rating than gasoline, so it takes more fuel by volume to drive the same distance. To find the fuel, see propane fueling station locations (propane_locations.html). For retail fuel prices, see the Alternative Fuel Price Report.

United States Environmental Protection Agency Transportation and Air Quality
Transportation and Regional
Programs Division

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SUCESS STORY



With 4,400 propane powered vehicles in its on road fleet, the Texas Department of Transportation (TxDOT) is a leader in the use of alternative fuel vehicles.

Driven in part by a Texas Law mandating that all state agencies purchase alternative fuel vehicles, the department has been using propane powered vehicles since 1992. Today, these vehicles, along with 1,000 vehicles powered by natural gas, comprise more than half of the department's total on-road fleet. Propane vehicles are also popular in Texas because propane is less expensive than gasoline and is manufactured in the state.

For more information, contact Don Lewis of Texas TxDOT at (512) 416-2085

Clean Alternative Fuels: Propane



One in a series of fact sheets

ore than 60 million Americans use propane gas for every thing from heating and cooling their homes and businesses to powering their barbecue grills. Propane is also used to fuel more than 350,000 vehicles on our roads today, from taxicabs and school buses to police cars. In fact, with more than 5,000 fueling station nationwide, propane is the most widely used alternative fuel used to date.

Propane (otherwise known as Liqufied Petroleum Gas or LPG) is a byproduct of natural gas processing and petroleum refining. In its natural state, propane is a colorless, nontoxic gas -- at least 90 percent propane, 2.5 percent butane and higher hydrocarbons, and the balance ethane and propylene. An odorant is added to the gas so it can be detected for safety reasons. Under moderate pressure, propane gas turns into a liquid mixture, making it easier to transport and store in vehicle fuel tanks. Compared with gasoline, propane can lower carbon dioxide, carbon monoxide, and other toxic emissions.

AVAILABILITY

Propane has been used as a transportation fuel since the 1940s. Today, auto manufacturers offer a variety of light and medium duty propane powered vehicles, primarily used by vehicles fleets. Many of these vehicles have two seperate fuel systems, allowing the vehicles to run on either propane or gasoline. Other automobiles can b converted from gasoline to dual fuel (i.e., propane and gasoline) for between \$1,000 and \$2,000. Conversion typically includes adding a special fuel tank to the vehicle's trunk.

EMISSIONS CHARACTERISTICS*

Actual emissions will vary with engine design; these numbers reflect the potential reductions offered by propane, relative to conventional gasoline.

- Potentially lower toxic, carbon dioxide (CO2), carbon monoxide (CO), and nonmethane hydrocarbon (NMHC) emissions.
- Rich calibration shows high NMHC and CO emissions, but lower nitrogen oxide (NOx) emissions.
- Lean calibration show slightly higher NOx emissions, but lower CO and NHMC emissions.

Estimates based on propane's inherently "cleaner" chemical properties with an engine that takes full advantage of these fuel properties.

