

Memorandum



CITY OF DALLAS

DATE September 8, 2021

TO Honorable Mayor and City Council

SUBJECT **Alternative Fuel Vehicle Infrastructure Overview – Hybrid/EV, CNG, and Biodiesel**

During the September 1 City Council budget amendments straw vote session, City Council Members asked questions regarding the City’s plan for alternative fuel vehicles, as well as hybrid and electric vehicle technology already in use by the City.

The FY 2020-21 budget included a City Council amendment for \$100,000 to fund an electric vehicle (EV) feasibility study with an emphasis on light duty vehicles. On May 26, 2021, the City Council awarded a contract to the National Renewable Energy Laboratory (NREL) to conduct the study. NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, and operated by the Alliance for Sustainable Energy LLC. The study will allow the City to develop the most effective and efficient policies and operational strategies for deployment and sustainment of electric vehicle technology in alignment with CECAP. We currently estimate NREL will complete the EV study in April 2022. We will brief the Environment and Sustainability Committee on the results/recommendations.

Provided below are a series of definitions and descriptions for the various vehicle types, as outlined by the U.S. Department of Energy, along with the existing complement of City assets within each category. This diverse mix and expansive use of alternative fuels has allowed the City of Dallas to be recognized by the NCTCOG with the “Gold” Fleet award the past two years.

Hybrid Electric Vehicles (HEV) – Current Inventory = 215, On Order = 50



HEVs are powered by an internal combustion engine and an electric motor that uses energy stored in a battery. The vehicle is fueled with gasoline to operate the internal combustion engine, and the battery is charged through regenerative braking, not by plugging into an electric power source.

Plug-In Hybrid Electric Vehicles (PHEV/PEV) – Current Inventory = 1, On Order = 0



PHEVs are powered by an internal combustion engine and an electric motor that uses energy stored in a battery. PHEVs can operate in all-electric or charge-depleting mode. To enable operation in all-electric mode, PHEVs require a larger battery, which can be plugged into an electric power source to charge. To support a driver’s typical daily travel needs, most PHEVs can travel between 20 and 40 miles on electricity alone, and then will operate solely on gasoline, similar to a conventional hybrid.

All-Electric Vehicles (EV/BEV/PEV) – Current Inventory = 10, On Order = 0



EVs, also called battery electric vehicles, have a battery that is charged by plugging the vehicle into charging equipment. EVs always operate in all-electric mode and have typical driving ranges from 150 to 300 miles. The City has 12 charging stations for its fleet.

Natural Gas Vehicles – Current Inventory = 466



The advantages of natural gas as a transportation fuel include its domestic availability, widespread distribution infrastructure, and reduced greenhouse gas emissions over conventional gasoline and diesel fuels. When used as a vehicle fuel, natural gas can offer life cycle greenhouse gas (GHG) emissions benefits over conventional fuels, depending on vehicle type, duty cycle, and engine calibration. In addition, natural gas reduces some engine emissions. Argonne National Laboratory's GREET model estimates the life cycle petroleum use and GHG emissions of light-duty vehicles running on compressed natural gas (CNG) and liquefied natural gas (LNG). Based on this model, natural gas emits approximately 6 percent to 11 percent lower levels of GHGs than gasoline throughout the fuel life cycle.

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Diesel Vehicles Using Biodiesel – Current Inventory = 1,678



Biodiesel and conventional diesel vehicles are one and the same. Although light-, medium-, and heavy-duty diesel vehicles are not technically alternative fuel vehicles, almost all are capable of running on biodiesel blends. When used as a vehicle fuel, biodiesel can offer considerable greenhouse gas (GHG) emissions benefits. Life cycle analysis completed by Argonne National Laboratory found that emissions for 100 percent biodiesel (B100) are 74 percent lower than those from petroleum diesel. The California Air Resources Board has reported similar values for its life cycle analysis of biodiesel from various sources.

If you need further information or have additional questions, please contact Donzell Gipson, Director of Equipment and Fleet Management, at 214-671-5131.


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