



Department Source: Public Works

To: City Council

From: City Manager & Staff

Council Meeting Date: August 19, 2019

Re: Report: Operational Cost Comparison of Existing and Potential Transit Vehicles

Executive Summary

Staff has prepared for Council consideration a report related to the operational cost comparison of existing and potential transit vehicles. At the June 10, 2019 City Council Budget Work Session, Councilperson Thomas requested a comparison of operating costs of existing and potential transit vehicles. This report includes the purchase price, annual depreciation, per-mile maintenance costs, per-mile fuel costs, and estimated annual operating costs for all of the currently owned Go COMO transit vehicle types. Estimated costs for smaller, potential Go COMO transit vans and autonomous electric transit shuttles are also discussed.

Discussion

Vehicles Currently Owned by Go COMO

Go COMO currently operates eight (8) gas powered paratransit shuttles and five (5) paratransit shuttles that have been converted to compressed natural gas (CNG) engines. Although maintenance costs for each of these vehicle types is similar, and fuel costs for the CNG shuttles are lower, the CNG converted vehicles have demonstrated many problems related to fuel injection so they tend to spend more time out of service for repairs than the gas powered shuttles. In FY 2018, gas powered paratransit shuttles operated an average of 18,000 miles per vehicle, while the CNG shuttles operated an average of 11,000 miles per vehicle.

Go COMO also operates six (6) 30' and sixteen (16) 40' diesel buses, as well as two (2) 40' buses with original CNG engines. Unlike the CNG converted paratransit shuttles, the 40' CNG buses have proven extremely reliable and operate at half the fuel and maintenance costs of diesel buses. Go COMO is currently in the process of purchasing one additional 40' CNG bus, to be paid for with funds from an FTA grant awarded for that purpose in FY 2018. Per the direction of council, the majority of planned vehicle purchases for FY 2019 and beyond will only be for 30' buses or smaller, shuttle buses or vans. However, the 40' buses do still prove very useful for the MU Shuttle service provided by Go COMO; the Hearnese and Reactor loops regularly fill the 40' buses to standing room capacity.

Finally, Go COMO currently operates three (3) 40' and two (2) 30' electric buses, part of a lease to own agreement with BYD motors. Four (4) additional newly constructed BYD 30' electric buses are planned to arrive in September to replace four (4) of the electric buses that were also part of the lease to own agreement, but which demonstrated long-term mechanical issues. In all, Go COMO will operate three (3) 40' and six (6) 30' electric buses in FY 2020.



In addition, four (4) BYD 30' buses have been purchased outright, with 100% grant funding, and will be constructed by the end of next fiscal year. By FY 2021, Go COMO's electric fleet will total 12, including three (3) 40' and nine (9) 30' electric buses.

Currently Owned Go COMO Vehicles: Purchase & Operating Costs

Vehicle Types	Useful Life Benchmark*	Purchase Price	Annual depreciation**	Per-Mile Maintenance Costs***
Paratransit Shuttle (Gas)	5 years 100,000 miles	\$79,000	\$15,800	\$0.80
Paratransit Shuttle (CNG)	5 years 100,000 miles	\$90,000	\$18,000	\$0.78
30' Diesel	10 years 350,000 miles	\$425,000	\$42,500	\$2.25
40' Diesel	12 year 500,000 miles	\$475,000	\$39,583	\$4.89
40' CNG	12 year 500,000 miles	\$525,000	\$43,750	\$2.40
30' Electric	10 years 350,000 miles	\$468,000	\$46,800	\$0.50
40' Electric	12 year 500,000 miles	\$515,000	\$42,917	\$1.44

*Useful benchmark life is based on FTA recommendations. Vehicles are maintained for the number of recommended years.

**Depreciation costs are estimated based on purchase costs/# of years for useful benchmark life.

***Total FY 2018 maintenance costs for vehicle type/total annual miles for vehicle type.

Vehicle Types	Miles per gallon (or kWh)	Cost per gallon* (or kWh)	Cost per mile	Avg. Annual Operating Costs, w/depreciation**
Paratransit Shuttle (Gas)	8	\$1.97	\$0.25	\$42,259
Paratransit Shuttle (CNG)	10	\$1.92	\$0.19	\$42,480
30' Diesel	5	\$2.36	\$0.47	\$111,253
40' Diesel	4	\$2.36	\$0.59	\$178,152
40' CNG	6	\$1.92	\$0.32	\$112,536
30' Electric	5.53	\$0.32	\$0.06	\$60,909
40' Electric	4.18	\$0.32	\$0.08	\$81,267

*Cost per gallon is based on the average cost of all fuel purchased and entered into the fleet tracking system since 1998.

**Based on avg. estimate of 25,982 annual miles to provide estimate for all vehicle types accounting for difference in avg. annual miles driven—an avg of the annual paratransit van miles (16,879) and the annual 30' and 40' bus miles (35,085).

Potential Vehicles for Go COMO Purchase

The purchase, depreciation and operating cost estimates for potential transit vans are very similar to the currently owned paratransit vans. Since there is no current record of potential maintenance costs, per the table below, the maintenance costs for the gas and CNG models are based on the paratransit van costs. The Hybrid fuel and maintenance cost estimates are based on a compilation of the costs related to the gas vans and electric buses. Currently there are no fully electric transit vans on the market but roll-outs are planned for 2021.



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Transit Vans	Useful Life Benchmark	Purchase Price	Annual depreciation	Miles per gallon (or kWh)	Cost per gallon (or kWh)	Cost per mile	Per-Mile Maintenance Costs
Gas	8	\$72,000	\$9,000	8	\$1.97	\$0.25	\$0.80
CNG	8	\$84,000	\$10,500	10	\$1.92	\$0.19	\$0.78
Hybrid	8	\$86,000	\$10,750	15	\$1.97	\$0.13	\$0.60

In addition, autonomous, fully electric transit shuttles are making their way into the American market. The shuttle company Navya currently offers autonomous electric shuttle pilot programs from one week to three months, as well as lease and full purchase options. Per federal requirements, the shuttles are required to have a safety operator on board at all times. Municipal transit drivers are generally trained as safety operators for the shuttles. Fully autonomous shuttles, without safety operators, are already being deployed in Europe, and the company hopes to see future U.S. policy changes to allow for similar fully autonomous shuttle operations in the states. The shuttles are small with 15 passenger capacity and current U.S. models are only deployed for first and last mile trips of 3 miles or less. The average full price for a shuttle is \$300,000; however costs go down if more than one shuttle is purchased.

The Department of Transportation is in the process of granting funds for autonomous shuttle projects for 2020, and the application cycle has ended. However, funding opportunities may open in January 2020 for 2021 funding applications. In addition, project funding from the Wilson Foundation is currently being considered to fund an autonomous paratransit shuttle pilot project in Michigan. Organizations interested in supporting disabled and/or low-income populations are showing interest in funding autonomous shuttle projects, as future fully autonomous deployments could result in long-term costs savings for transit service provision. AAA also recently funded a pilot project for the transit contractor Keolis to provide automated shuttle service to the City of Las Vegas.

Fiscal Impact

Short-Term Impact: None related to this report.

Long-Term Impact: None related to this report.

Strategic & Comprehensive Plan Impacts

Strategic Plan Impacts:

Primary Impact: Infrastructure, Secondary Impact: Secondary, Tertiary Impact: Tertiary

Comprehensive Plan Impacts:

Primary Impact: Mobility, Connectivity, and Accessibility, Secondary Impact: Secondary, Tertiary Impact: Tertiary



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Legislative History

Date	Action
06/10/2019	City Council Budget Work Session, Councilperson Thomas requested a comparison of operating costs of existing and potential transit vehicles.

Suggested Council Action

This report is for informational purposes only.