Electric Bus Update

Presentation to the Metropolitan Council

March 10, 2021

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Overview

- Electric Bus Pilot Update
- 60-foot Bus Procurement
- Advancing the Electric Bus Program

Electric Bus Pilot Background

- 2017: Awarded Low / No Emissions grant of $1.75 M
- 2018: 8 electric and 6 diesel buses procured for C Line service
- February 2019: First METRO C Line electric bus delivered
- April 2019: 4 of 8 depot chargers delivered
- May 2019: First of two on route chargers delivered
- June 2019: METRO C Line Opens

Electric Bus Pilot Status

- No tailpipe propulsion emissions (some emissions from auxiliary diesel heater)
- Customers like and want electric buses
- Smoother, quieter ride
- When on route chargers work, range performance meets pilot program expectations (120-140+ miles based on weather)
- C Line provides a good opportunity for experience and evaluation
  - Range
  - Reliability
  - Cost

Electric Bus Pilot Range and Reliability

Unable to implement service plan based on targeted range

- 631 service days (June 2019 through February 2021)
- Both depot and online chargers available for 152 of the 631 days
- Diesel buses available on average 90% of days while electric buses available on average 72% of days
- 10 days with all electric buses and all chargers available

Electric Bus Pilot Range and Reliability

Alternative service plan required 5 more diesel buses to cover lost range

- Electric bus was 60% of planned C Line fleet and represented 24% of total miles.
- 71,000 average miles for diesel buses vs 31,000 average miles for electric bus
- Electric bus pilot program has been suspended 3 times, including March 2, 2021
- Today, all chargers are shut down and planned for replacement

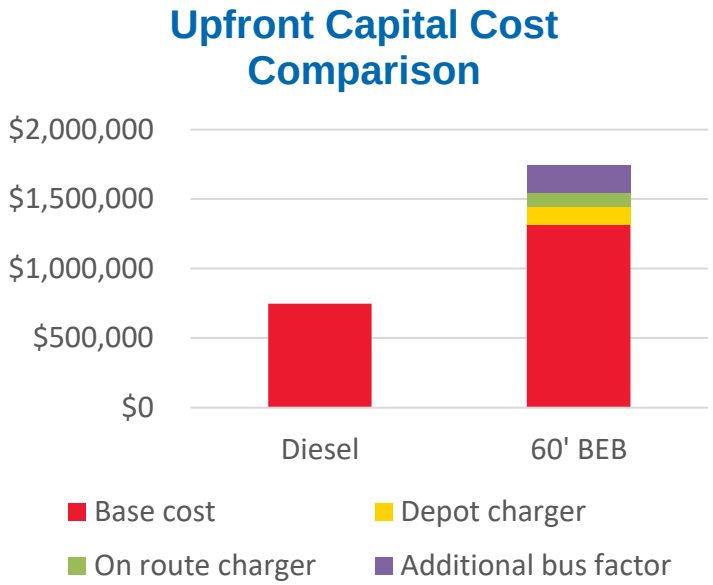
60’ Electric Bus Cost Estimates

- Added upfront capital costs for 60’ electric bus and infrastructure
  - Per bus cost ~$570,000 more than diesel
  - Additional buses due to range limits ~$200,000
  - Depot charger cost per bus ~$125,000
  - On route charger cost per bus ~$100,000

  Total + $995,000 estimated incremental cost per 60’ electric bus

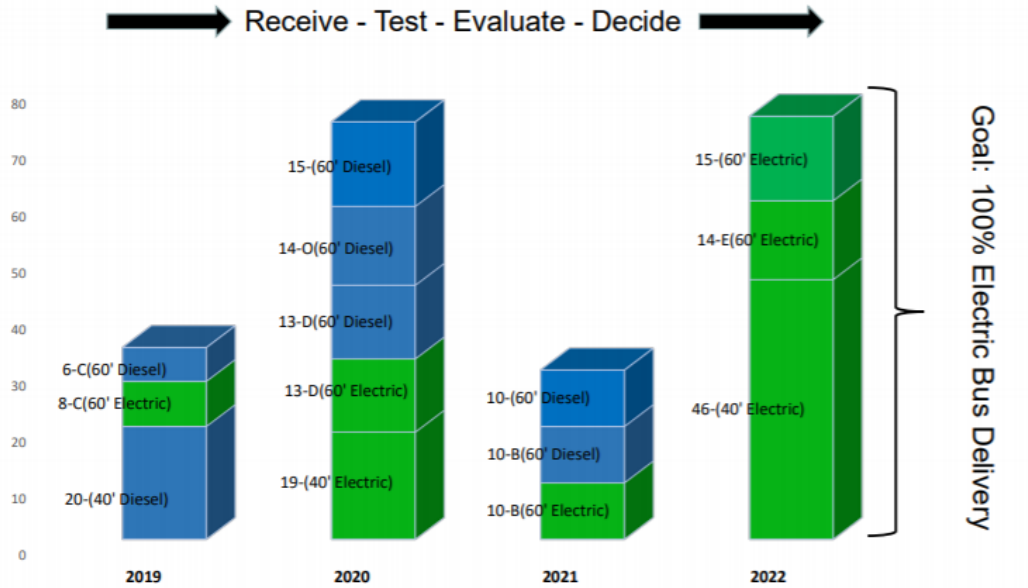
- Cost of operations and lifecycle maintenance
  - Fuel cost
  - Estimated midlife battery replacement of $300 K
  - Bus preventative maintenance
  - Bus repair maintenance
  - Charger preventative maintenance
  - Charger repair maintenance

- Not yet able to predict lifecycle operations and maintenance costs



December 2018 “Bus Fleet Strategy” Presentation

Procurements 2019 - 2022



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60’ Bus Procurement Overview

Business item 2021-53 authorizes a base order of 143 sixty-foot diesel buses with options for 29 additional buses in a total amount not to exceed $121,997,561

- METRO Orange Line: 14 buses
- METRO D Line 18 buses (in addition to 8 already purchased)
- METRO B Line: 20 buses
- Commuter express route replacements: 91 buses

Applying Experience to 60’ Bus Procurement

- 60’ electric bus is new technology that poses range, reliability, and cost challenges, especially for longer routes
- Proposed 60’ bus procurement, given the route types, is not the best next step for electric bus program growth
- What offers the best value for our electric bus dollar?

Advancing the Electric Bus Program

- New Minneapolis Bus Garage intentionally designed to accommodate electric buses in the future
- Partnership with Xcel in electric vehicle proposal
- FTA Low / No Emissions Grant opportunity
- Forthcoming master contracts for future fleet electrification work
- Expand experience to 40’ electric buses

Next Steps

- Bring forward fleet electrification master contract business item
- Plan regular updates to Metropolitan Council
- Launch webpage to consolidate information and updates
  - www.metrotransit.org/electric-buses