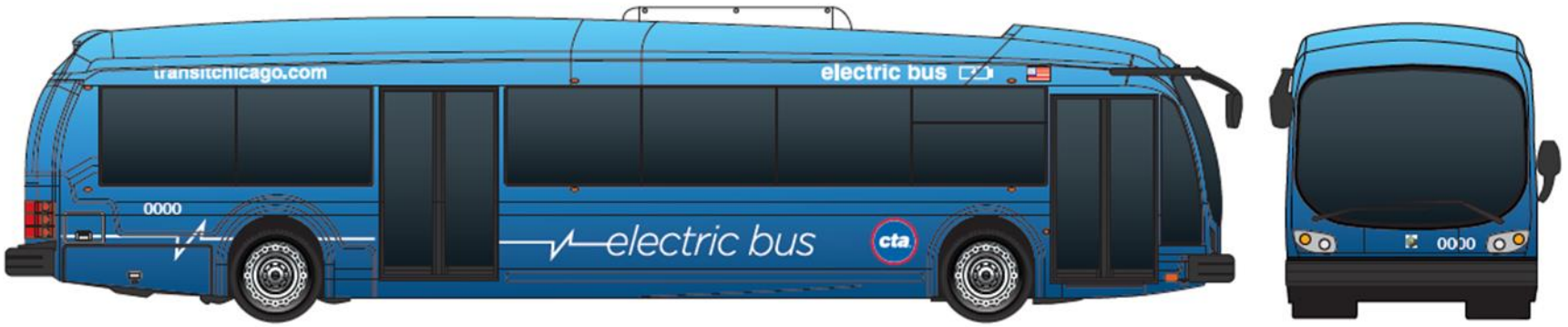


Electric Bus Update

CTA Board Meeting
November 17, 2021

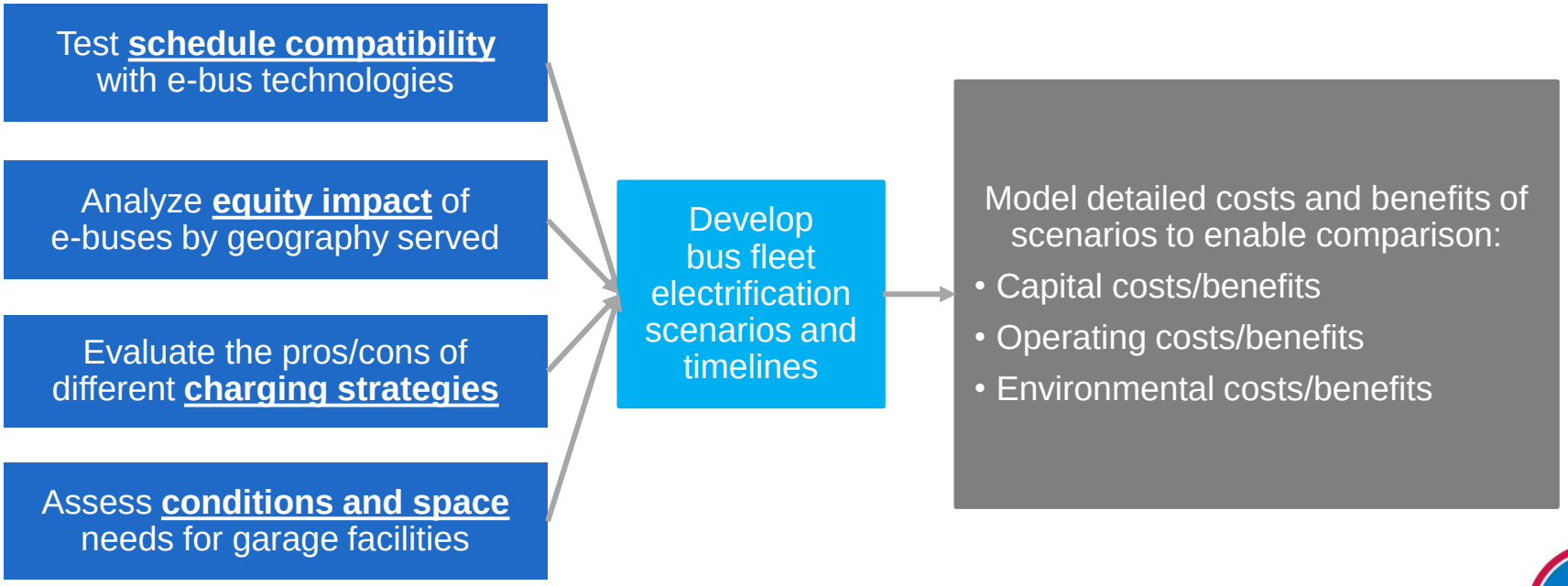
CTA Goal:

Electrify entire bus system by 2040

- 1,860+ buses in the fleet
- 24/7 bus service
- 127 bus routes
- 7 garages for bus storage & maintenance
- 1 heavy maintenance facility
- Buses are often scheduled to be in service for 100+ miles per day
- Effective range of 40-foot electric bus is about 70 miles

Electric Bus Implementation Study

- **The CTA bus fleet electrification study is ongoing, completion anticipated before the end of 2021.**
- **This study will include strategic recommendations and outline an achievable transition to an all-electric bus fleet for CTA by the target date of 2040.**



CTA's Electric Bus Program: Past, Present, and Future

2014 - 2019

- 2 New Flyer e-buses
- 2 garage chargers
- AM & PM rush period service

2020 – 2024

- 8 Proterra e-buses in service in 2021; 17 more entering service in 2022
- Contract options enable purchasing up to 22 more
- On-route chargers at Navy Pier, Chicago/Austin, Midway
- Retrofitted New Flyers
- Grant for 6 Nova Bus e-buses and 6 garage chargers

2025 – 2040+

- New procurements for e-buses and charging infrastructure
- Power upgrades at charging locations
- Full electrification of all 7 garages and bus heavy maintenance facility
- Potentially more on-route charging

Electric Bus Myths & Facts

- **Myth: Electric vehicles have no climate changing emissions.**
  - Facts:
    - Powering vehicles via the electric power grid will reduce GHG emissions significantly, but not to zero because our grid still relies on some fossil fuel sources.
    - As more vehicles shift to electric, we need to make sure we are simultaneously expanding renewable energy production to meet and exceed the added demand for electricity.

Electric Bus Myths & Facts

- **Myth: CTA buses are a significant source of health-impacting pollution, especially in low income and minority communities.**
  - Facts:
    - CTA buses are responsible for a very small portion of vehicle emissions and overall emissions throughout the City of Chicago.
    - Even on corridors with the most frequent bus routes, buses typically constitute less than 2% of all vehicles.
    - More significantly, in September of 2021 there were around 465,000 bus rides per weekday. If you assume a third of those trips could have been made by foot, bike, or not made at all, that's still more than 200,000 car trips per day kept off the roads by operation of CTA transit.

Electric Bus Myths & Facts

- **Myth: If CTA stopped buying diesel buses right away and bought electric buses instead, our air would be cleaner, and our greenhouse gas (GHG) emissions would go down.**
  - Facts:
    - If CTA stopped buying diesel buses today, we would not have the charging infrastructure to support a sufficient number of replacement electric buses.
    - This means CTA would need to cut service and/or depend on an increasingly aged diesel fleet, which would be more polluting and less reliable.
    - Diesel buses bought today will be retired before the 2040 electrification goal date.

Electric Bus Myths & Facts

- **Myth: There is no environmental or health benefit to replacing an older diesel bus with a new diesel bus.**
  - Fact:
    - The diesel buses to be purchased in 2022 will be more fuel efficient and emit 22% less CO2, 64% less NOx, and 91% less PM2.5 (particulate matter) on a per-mile basis compared to the older buses they will replace.

Electric Bus Myths & Facts

- **Myth: CTA is buying 1,280 diesel buses in the next two years.**
  - Facts:
    - CTA has a contract and funding to buy 100 new diesel buses in 2022, with an option to buy 500 more.
    - Approximately 700 more diesel buses will reach the end of their useful life before 2026, there is no funding or contract in place to replace these buses.
    - To the degree that the grid power supply and charging infrastructure can be scaled up, CTA could replace some portion of these older diesels with electric buses.

Electric Bus Myths & Facts

- **Myth: CTA is not buying electric buses because they have higher purchase prices, and CTA is ignoring the projected operating savings.**
  - Facts:
    - The primary barrier to immediate, large-scale deployment of electric buses is the not the purchase price of the vehicles, but the time and resources needed to install the new power and charging infrastructure to support those vehicles.
    - CTA is aware of the significant operating savings potential from electric buses, and we hope to realize these savings as we continue to scale up our electric fleet.

Electric Bus Myths & Facts

- **Myth: CTA is not considering any other clean vehicle technologies to achieve bus fleet emissions reductions.**
  - Facts:
    - CTA's goal is to reduce health-impacting and climate changing emissions from buses, to the maximum extent feasible.
    - As we pursue conversion to an 100% electric bus fleet, CTA will continue to monitor and assess emerging technologies that have equivalent (or better) benefits to air quality and climate.
    - Where performance, cost, and service compatibility compare favorably, we will pilot other technologies.
    - CTA was a pilot location for three federally sponsored hydrogen fuel cell buses from 1997 through 2001.

Electric Bus Myths & Facts

- **Myth: The electric bus industry is sufficiently mature to support a near-term conversion of CTA's entire fleet.**
  - Facts:
    - While great strides have been made, this technology is still evolving and there are several aspects that have not been fully tested that could have significant implications for CTA's overall strategy for deployment.
    - For example, two main types of chargers are currently available, "fast-chargers" and "slow-chargers." Fast chargers have many advantages in terms of cost and operational flexibility, but further experience is needed to assess the degradation rate of batteries when repeatedly fast charged and reliability when fast-charged buses are stored outdoors in cold climates.

Electric Bus Myths & Facts

- **Myth: Other transit agencies are doing much more to reduce emissions faster.**
  - Facts:
    - Several peer agencies are in the process of fulfilling ambitious electric fleet commitments but are generally introducing tens of electric buses at a time.
    - CTA is fully engaged in interagency forums and working groups to assess successes and failures around the country and the world. The data from CTA E bus operations dating to 2014 is some of the most complete long-term information available in the US.
    - Our goal is to plan carefully and invest in reliable technologies that will yield positive returns, in terms of public funding invested, quality of transit service delivered, and environmental benefits achieved.

Looking Ahead Toward Full Bus Fleet Electrification

- Complete the electric bus implementation study; release public report on the findings and recommendations (anticipated this winter)
- Continue to secure federal and other funding to purchase electric buses, upgrade bus facilities, and install charging infrastructure
- Coordinate with ComEd for grid improvements to upgrade power supply to support charging infrastructure at all CTA garages and some on-route locations
- Modernize all CTA garages and equipment to service electric buses
- Obtain additional funding to replace the entire bus fleet with electric buses, this will include replacing the first wave of electric bus procurements