

# Xpress Operations Committee

Charlotte Nash, Chair

December 7, 2023

# **Xpress Operations Committee**

## **Thursday, December 7, 2023**

### **Proposed Agenda**

- I. Call to Order – Charlotte Nash, Chair
- II. Approval of the Meeting Minutes for October 5, 2023
- III. Approval of the Agenda for December 7, 2023
- IV. Operations Performance Report – Jamie Fischer
- V. Xpress ZEB Transition Plan – Abby Marinelli
- VI. Adjournment



# **XPRESS PERFORMANCE REVIEW**

Jamie M. Fischer, PhD

Office of Business Intelligence and Data (BID)

December 7, 2023

# Xpress System Performance\*



- ▶ Regional Impact



- ▶ Ridership Productivity



- ▶ Xpress Fare Revenue

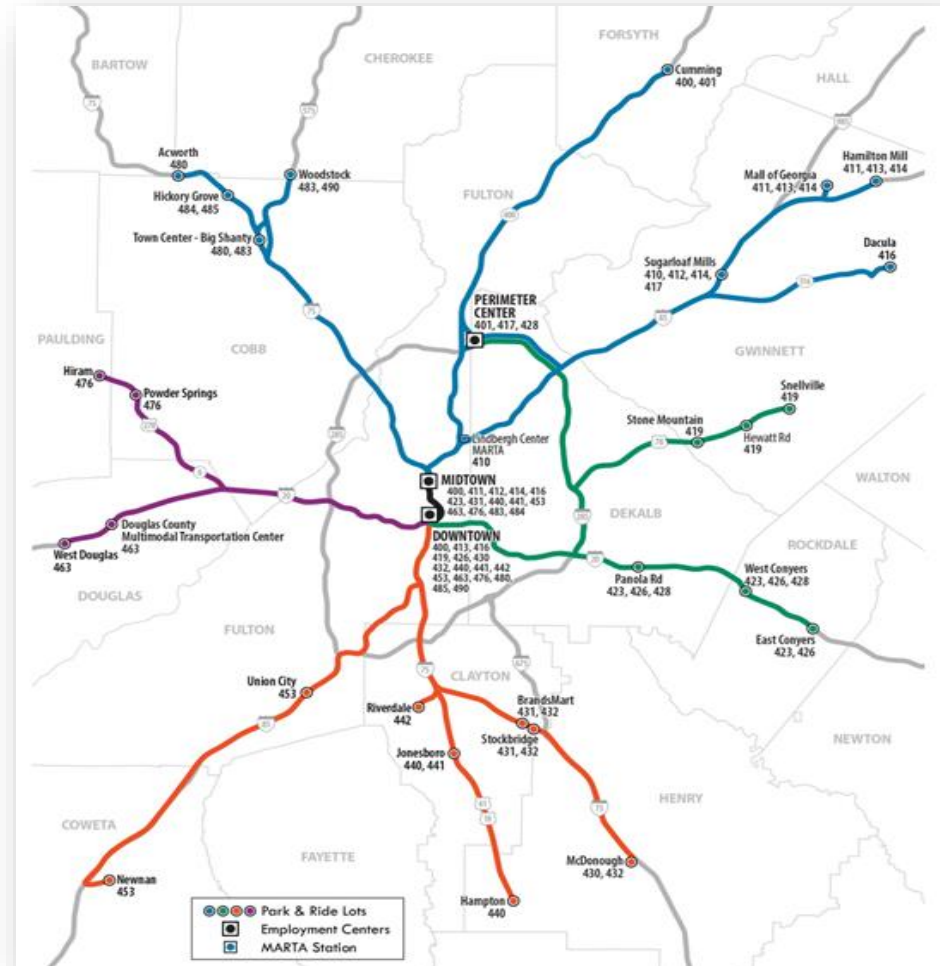


- ▶ System Reliability



## Vanpool Performance

- ▶ Routes & Ridership



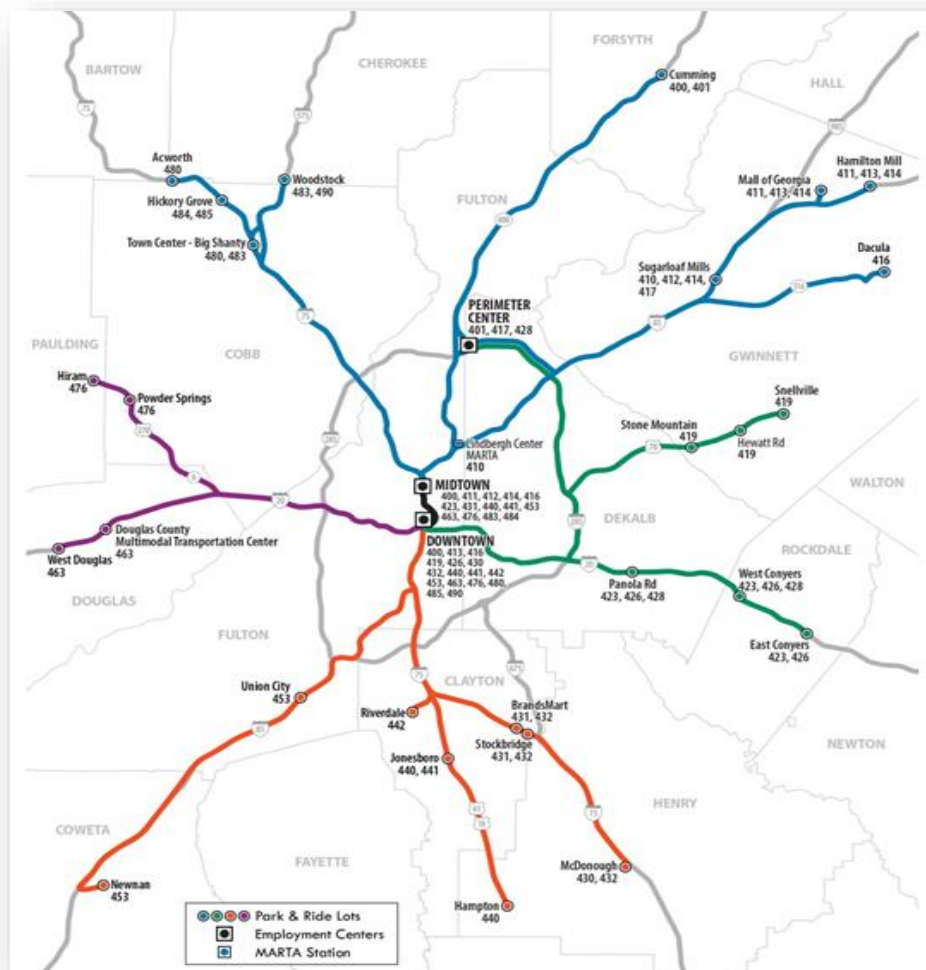
\* The Xpress Customer Feedback section will return in a future report. The data process is under review.

# Combined Mobility Impact

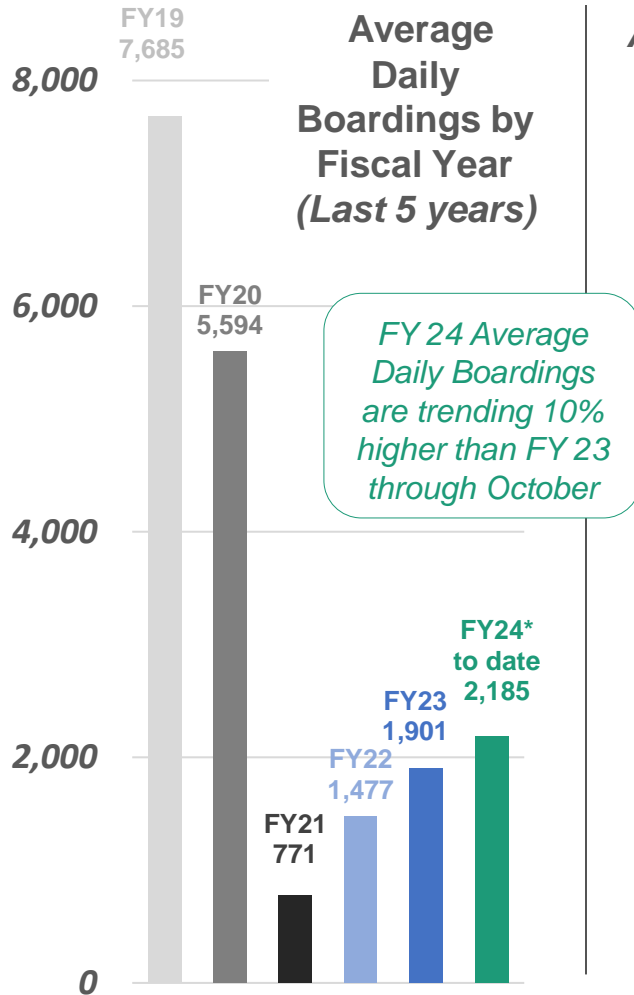


## Xpress and Vanpool currently provide:

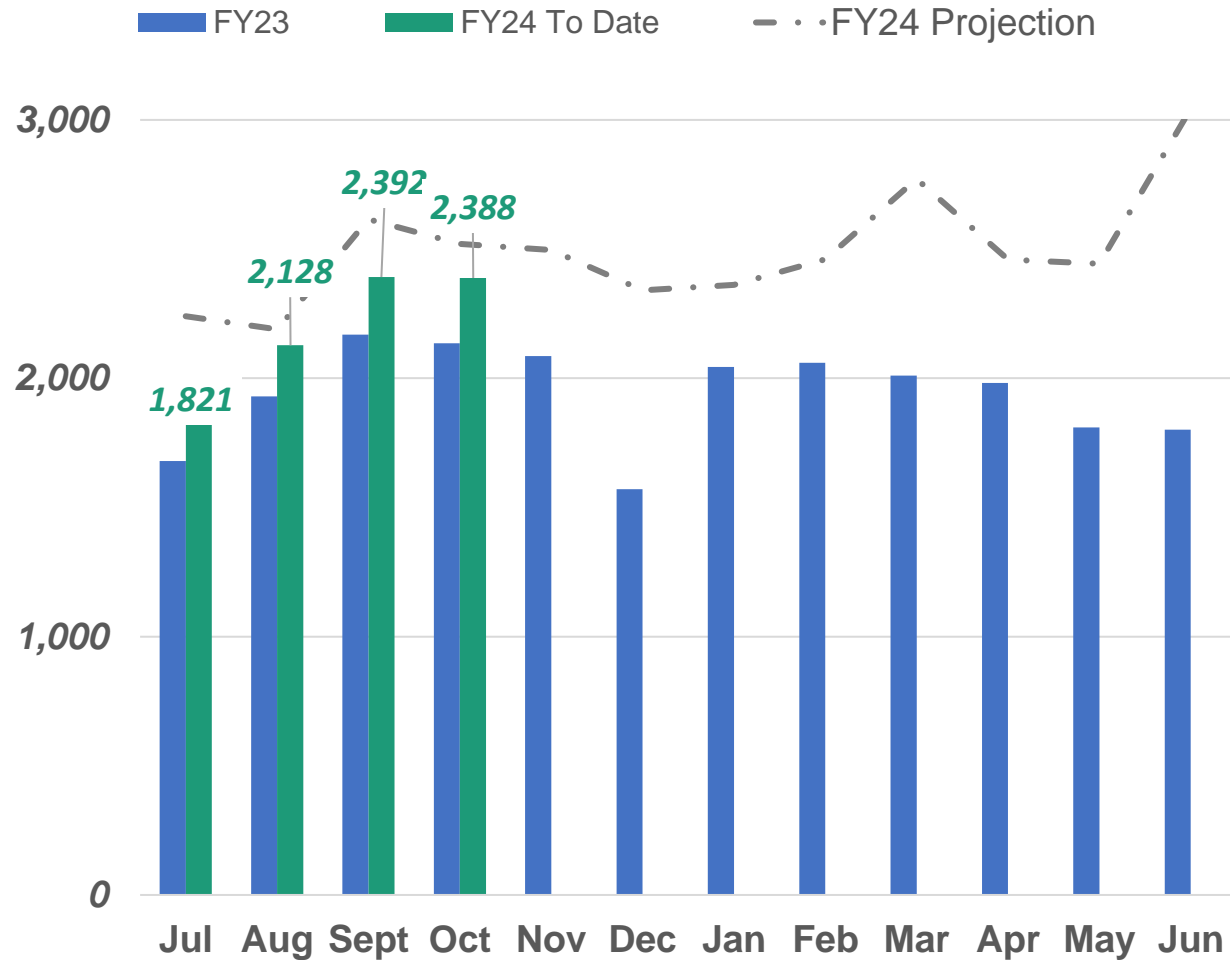
- ▶ A commute solution for residents of **more than 40 counties** (2022 Xpress Customer Survey + Recent Vanpool Statistics)
- ▶ **Averaging more than 3,700 passenger trips** on a typical weekday (October 2023)
- ▶ **Connections to:**
  - Major activity centers (Downtown, Midtown, Perimeter)
  - ATL-region transit network
  - Employment opportunities across Georgia and beyond



# Xpress Ridership Productivity – FY24 to Date

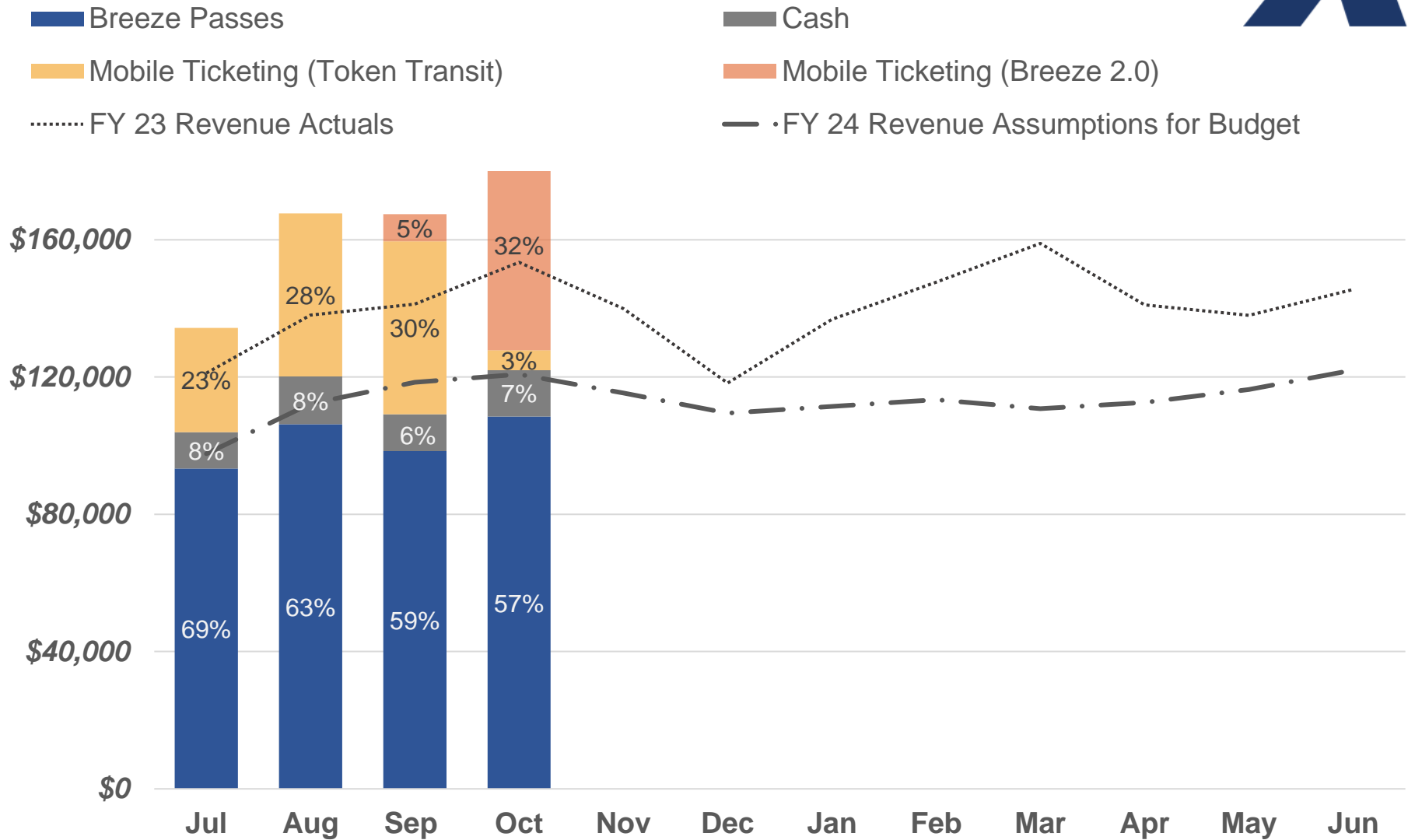


**Average Daily Boardings by Month**



\*FY24 Avg Daily Boardings are 28% of FY19's Avg Daily Boardings

# Xpress Fare Revenue



# Xpress System Reliability



## Reliability Includes

- Operating the trips as scheduled
- Buses arriving and departing on time, as scheduled

## Trips Operated (% of Scheduled Trips)

	Aug	Sep	Oct
North	99%	95%	94%
South	93%	99%	99%
Cobb	100%	99%	100%
Overall	96%	98%	98%

## On-time performance is best...

- In the morning, when traffic is more consistent
- At the first pick-up stop on each trip (*contractors held to 85%*)
- For routes that can use express toll lanes

## On Time Trip Departures (1<sup>st</sup> Stop)

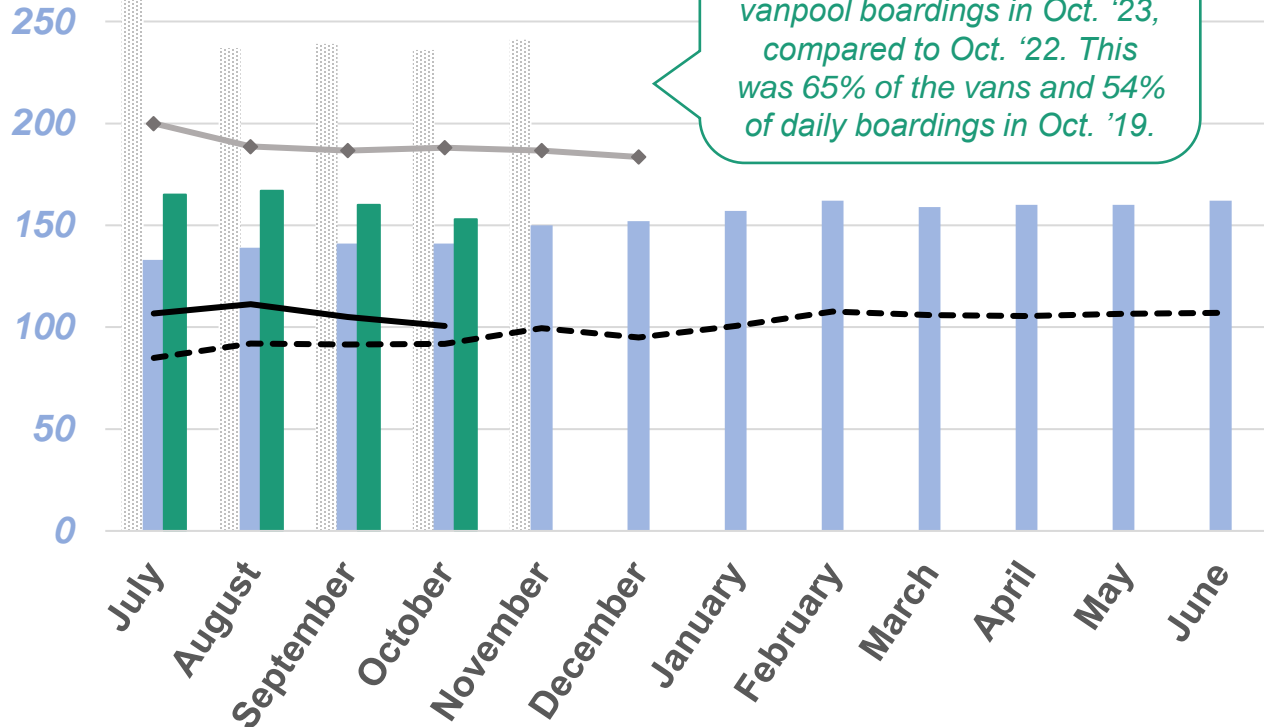
	Aug	Sep	Oct
AM	93%	94%	93%
PM	76%	71%	72%
Overall	85%	83%	83%



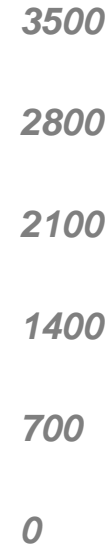


# Vanpool System Performance

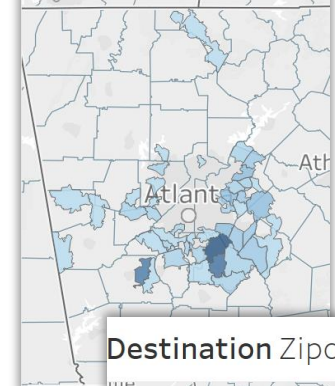
## Active Vans



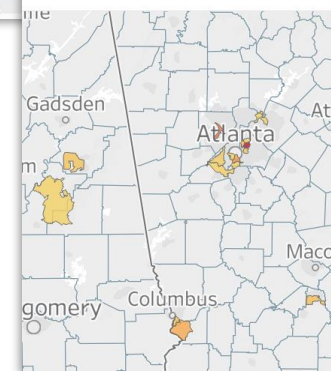
## Average Daily Boardings



## Origin Zipcode



## Destination Zipcode

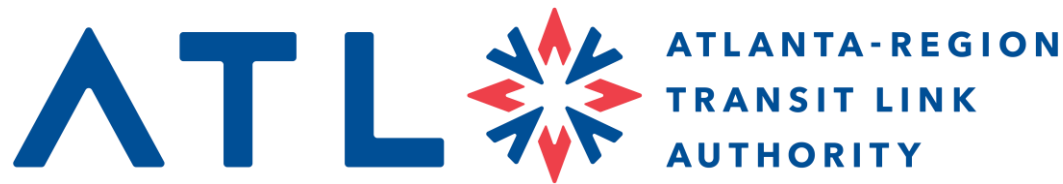


FY20 Active Vans
  FY23 Active Vans
  FY24 Active Vans  
 FY 20 Daily Boardings
  FY23 Daily Boardings
  FY24 Daily Boardings

Vanpool productivity depends on the number and size of vanpool groups who enroll. **Commute with Enterprise** is responsible for all advertisement of the service and administers vanpool formation.



**Questions?**



# **Xpress ZEB Fleet Transition Plan**

Abby Marinelli

December 7, 2023

# Why a Zero Emission Bus Plan?

- ▶ Through the Bipartisan Infrastructure Law, FTA is providing **over \$6 billion** in discretionary funds for ZEB deployment.
  - More than a 600% increase in funding from FY21 to FY22
- ▶ A ZEB Fleet Transition Plan is required to access these funds.
- ▶ ATL aims to enhance transit operator competitiveness and to create a cohesive and coordinated approach for regional fixed route public transit operators to transition to ZEBs.
  - MARTA is undertaking a separate analysis and those results will be incorporated when available.

# Why a Zero Emission Bus Plan?

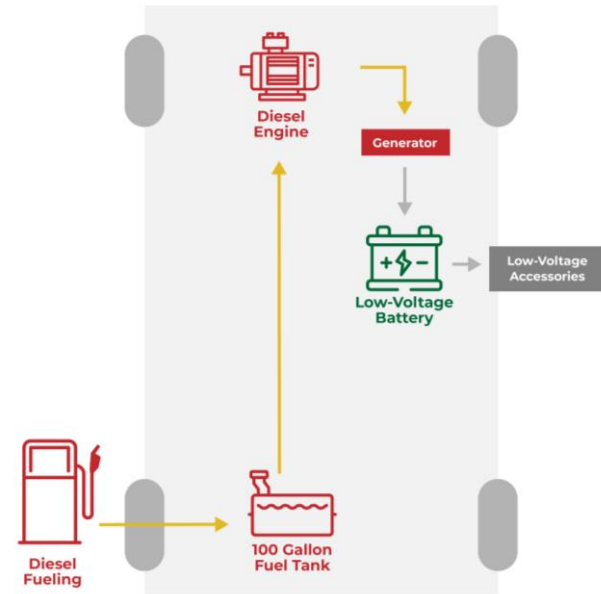
- ▶ Xpress ZEB Fleet Transition Plan is not an **implementation plan**, but a study of **potential actions**.
  - The Plan assumes service will remain as is for the next 20 years.
  - The dates, schedules, costs, and vehicle counts included here are representative of potential results ATL could achieve if we followed the process proscribed.
- ▶ The plan is considered a living document and will be revisited after the completion of the Redefine the Ride effort.
  - An implementation planning effort will be undertaken if and when necessary.

# Why Zero Emission Buses?

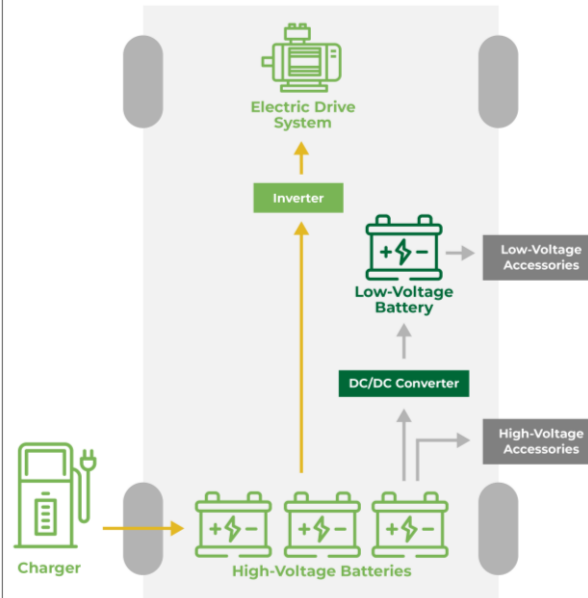
- ▶ Quieter and smoother vehicles, preferred by passengers and operators
- ▶ More efficient, lower energy consumption compared to Internal Combustion Engine (ICE) vehicles.
  - Zero tailpipe emissions
  - Potential lower source emissions
- ▶ Lower maintenance costs
- ▶ Potential for lower fuel costs

# Diesel vs. BEB vs. FCEB

## DIESEL VEHICLE



## BATTERY ELECTRIC VEHICLE



## FUEL CELL ELECTRIC VEHICLE

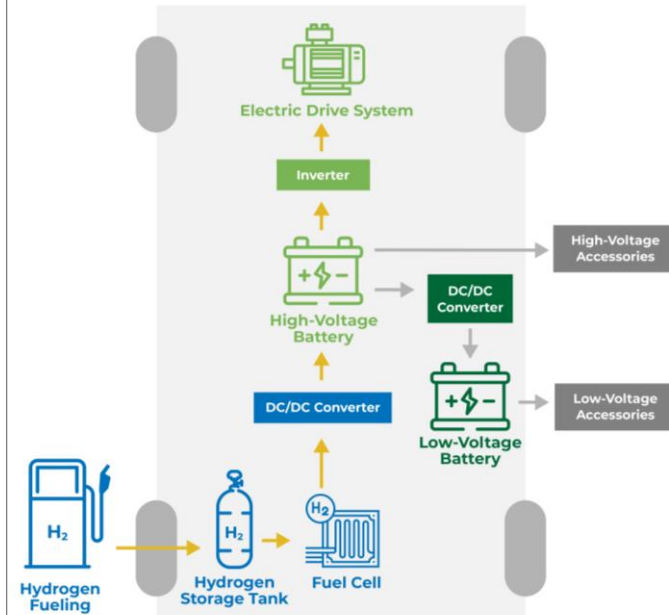


Image source: Center for Transportation and the Environment

# ATL's Project Partners



MARTA is undertaking a separate analysis and those results will be incorporated when available.





# Xpress Operations Evaluation

Three propulsion types

- ▶ Baseline Diesel
- ▶ Battery Electric Bus
- ▶ Fuel Cell Electric Bus

Evaluated along following operational aspects

- ▶ Fleet Assessment
- ▶ Service Assessment
- ▶ Fuel Assessment
- ▶ Maintenance Assessment



# **Baseline Diesel Analysis**

# Baseline Fleet and Service Assessment

- ▶ ATL Xpress has **165 buses**
  - 45' commuter coaches
  - 10 electric buses on order
- ▶ ATL Xpress runs **27 routes** and currently operates **27 park and ride lots**.

# Baseline Fuel Assessment

- ▶ Regional average 2022: \$3.57/gal.
- ▶ Diesel Fuel Cost per Mile: **\$0.85/mile**
  - For comparison, in 2022 AAA estimated that gas costs \$0.18/mile for personal vehicles.
- ▶ Diesel prices are well documented and relatively stable. Prices do not fluctuate with time-of-day demand or external factors like air temperature.

# Baseline Maintenance Assessment

- ▶ Actual costs: **\$14,027/bus**
- ▶ Includes labor, materials, midlife overhauls to engine and transmissions



# **Battery Electric Buses (BEB) Analysis**

# BEB Fuel Assessment

- ▶ Off-peak rates with Georgia Power: approximately \$0.05/kWh
- ▶ Electricity Cost per Mile: **\$0.12/mile**
- ▶ ATL Xpress has a great relationship with Georgia Power. Electricity prices do fluctuate with time-of-day demand, however this transition provides for ATL Xpress to charge during off peak times only, so time-of-day demand costs are minimized.
  - The ZEB Fleet Transition plan allows for only overnight charging, reducing the cost of demand charges through charge management software

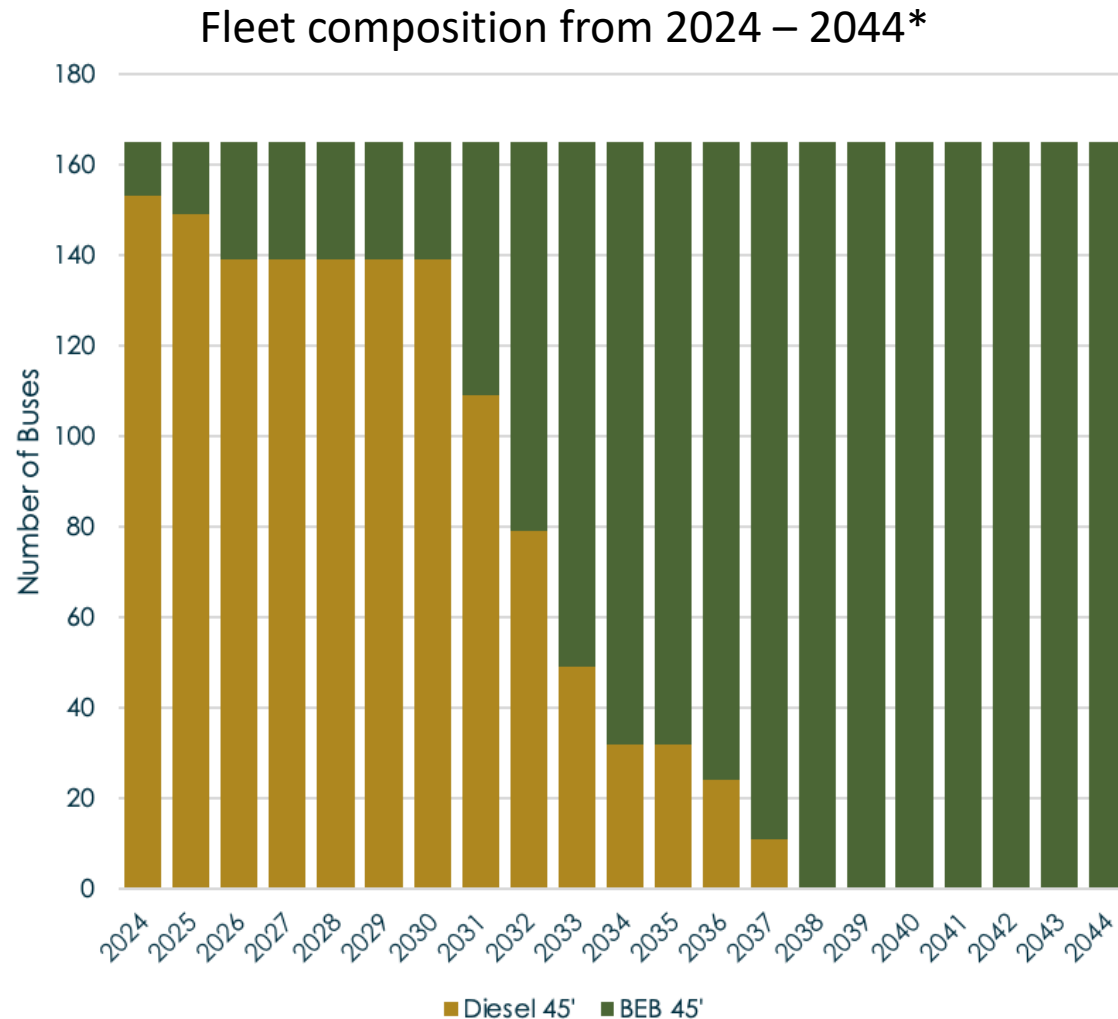
# BEB Maintenance Assessment

- ▶ Expected costs: **\$9,819/bus**
  - 30% reduction over diesel
- ▶ Includes labor and materials
- ▶ Cost of midlife battery overhaul is included in the vehicle purchase price with the purchase of a \$75,000, 12-year battery warranty



# BEB Fleet Transition

- ▶ Assuming existing service levels, ATL Xpress could achieve **100% ZEB by 2038.**



\*This will be reevaluated following Redefine the Ride results.



# **Mixed Fleet with Fuel Cell Electric Buses (FCEB) and BEB Analysis**

# FCEB Fuel Assessment

- ▶ Current price of delivered hydrogen: approximately \$9/kg
- ▶ Hydrogen Cost per Mile: **\$1.19/mile**
- ▶ Hydrogen costs are expected to decrease dramatically over time as hydrogen supply increases.
- ▶ The Xpress ZEB Fleet Transition Plan assumed hydrogen reached a \$5/kg price by the end of the transition.
  - At \$5/kg, the hydrogen cost per mile is expected to be \$0.65/mile.

# FCEB Maintenance Assessment

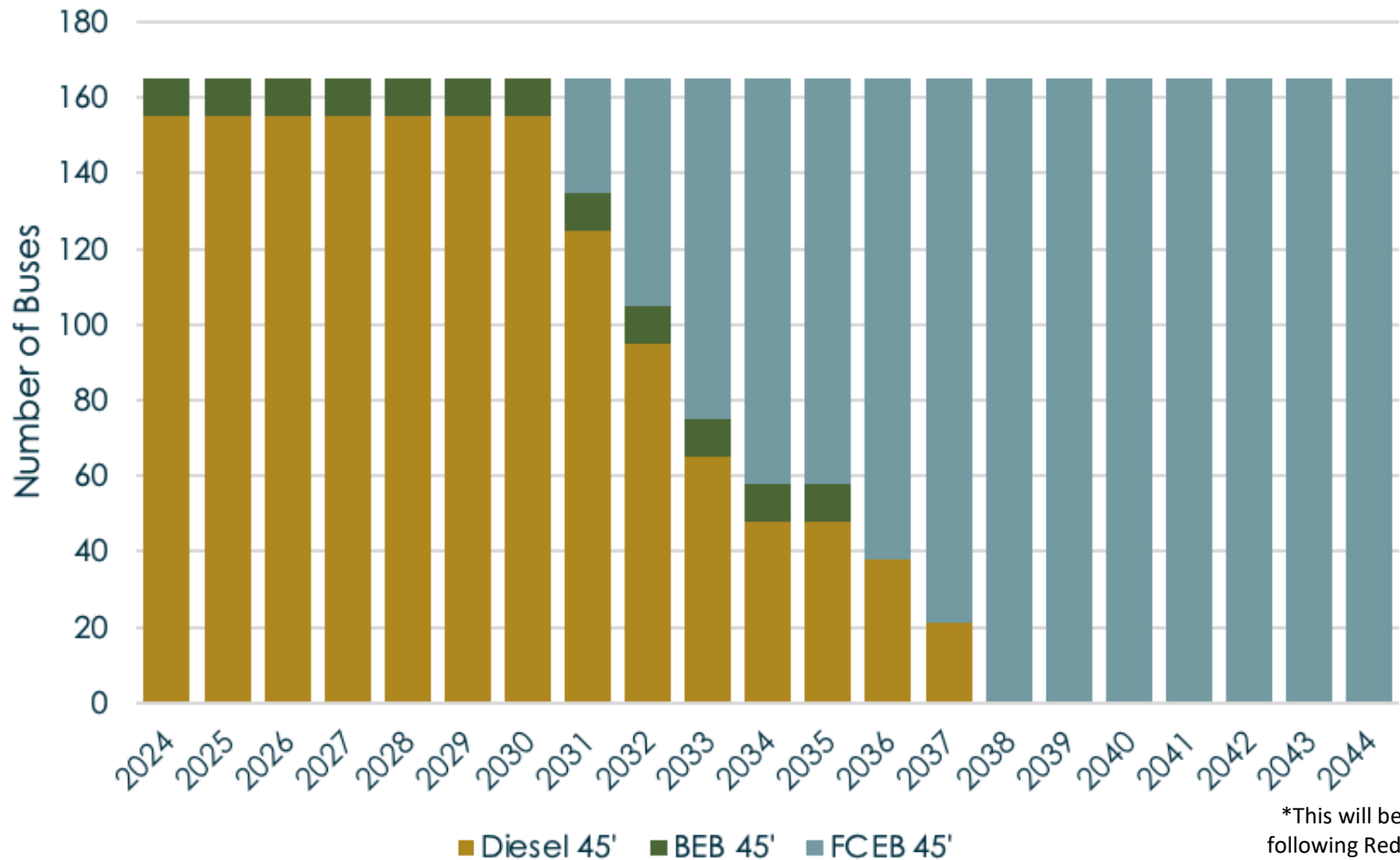
- ▶ Expected costs: **\$10,304/bus\***
- ▶ Includes labor and materials
- ▶ Cost of midlife overhaul is included in the vehicle purchase price with the purchase of a \$17,000 warranty
- ▶ Costs based on Orange County Transit Authority (OCTA), California's FCEB fleet

\*Data around FCEB's in actual use is limited; OCTA estimates that the cost of maintenance is \$0.56/mi. plus \$3,333 for annual overhauls to the bus.

# FCEB Fleet Transition

- ▶ Assuming existing service levels, ATL Xpress can achieve **100% ZEB by 2038.**

Fleet composition from 2024 – 2044\*



\*This will be reevaluated following Redefine the Ride results.

# Operations Evaluation Summary

Propulsion Type	Fleet	Service	Fuel	Maintenance
Baseline Diesel	165 vehicles	27 routes	\$0.85/mi.	\$14,027
BEB	1-to-1*	1-to-1*	\$0.12/mi.	\$9,819
FCEB	1-to-1*	1-to-1*	\$1.19/mi.	\$10,304
FCEB Projected	1-to-1*	1-to-1*	\$0.65/mi.	\$10,304

\*All propulsion types achieve a 1 to 1 replacement ratio to baseline diesel scenario.



# **Facilities Assessment**

# Facilities Assessment

▶ ATL Xpress operates out of three hubs:

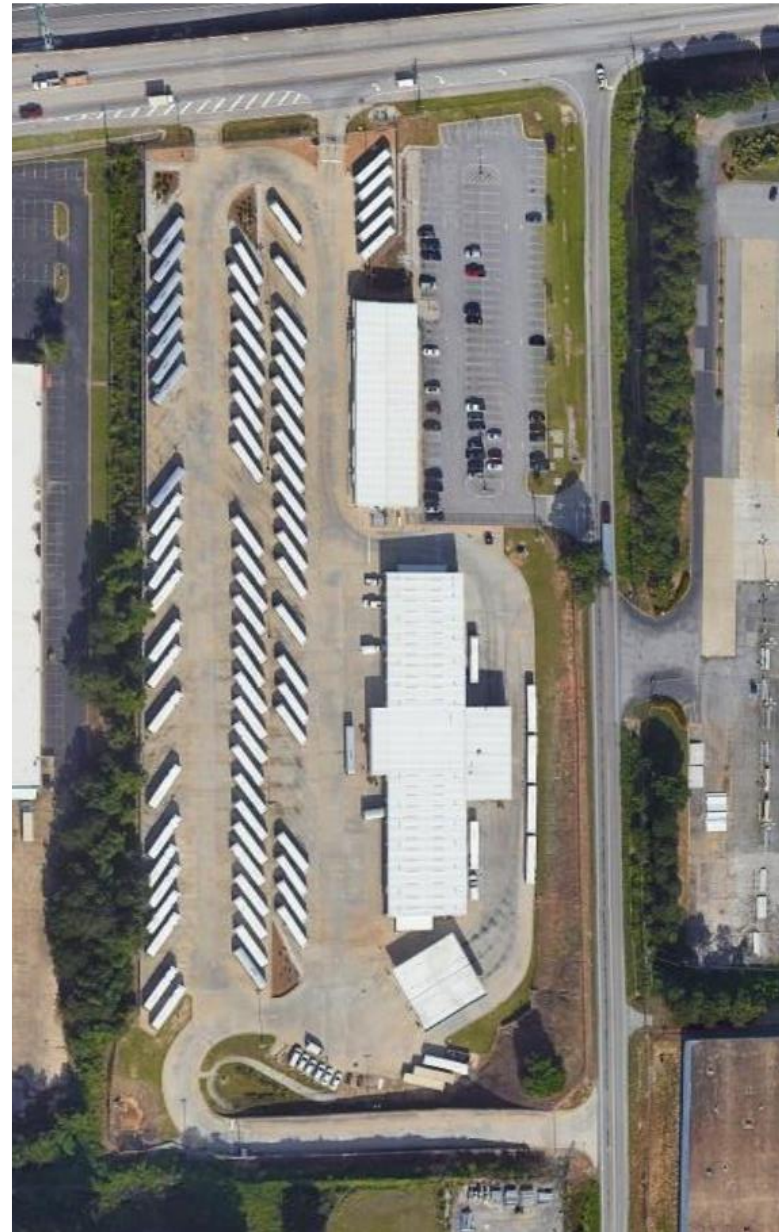
- South Ops
- North Ops
- Cobb County



# Facilities Assessment

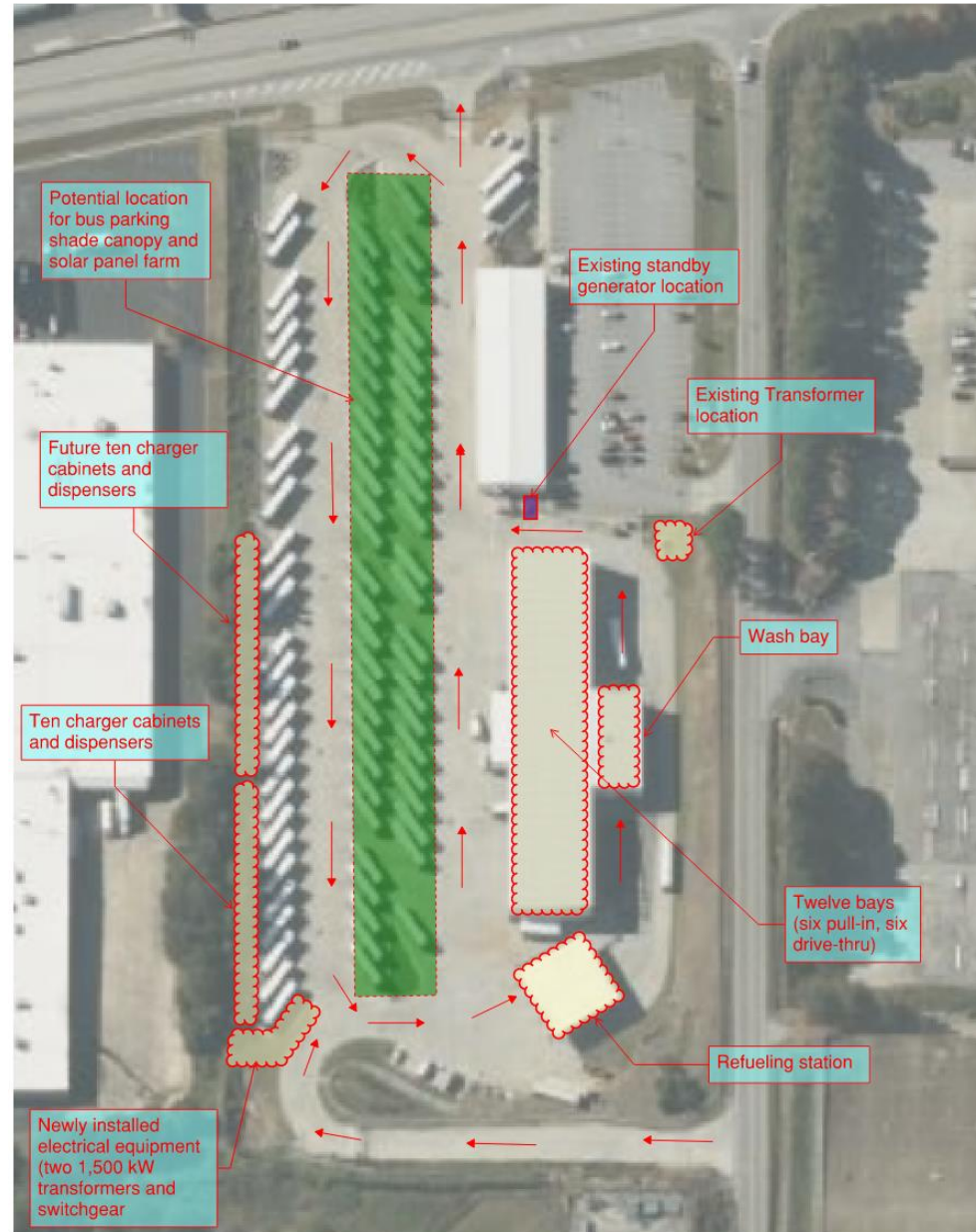
► ATL Xpress operates out of three hubs:

- South Ops
- North Ops
- Cobb County



# Facilities Assessment

- For either BEB or FCEB, several site modifications are necessary, including:
- New electrical equipment
  - New charger cabinets and dispensers or new fuel islands for hydrogen dispensing
  - Potential solar farm to offset grid electricity (could earn Renewable Energy Credits with GP)
  - Increased ventilation protocols





# **Total Cost of Ownership (TCO) and Benefit/Cost Analysis**

# Total Cost of Ownership Components

## ► Total Cost of Ownership includes:

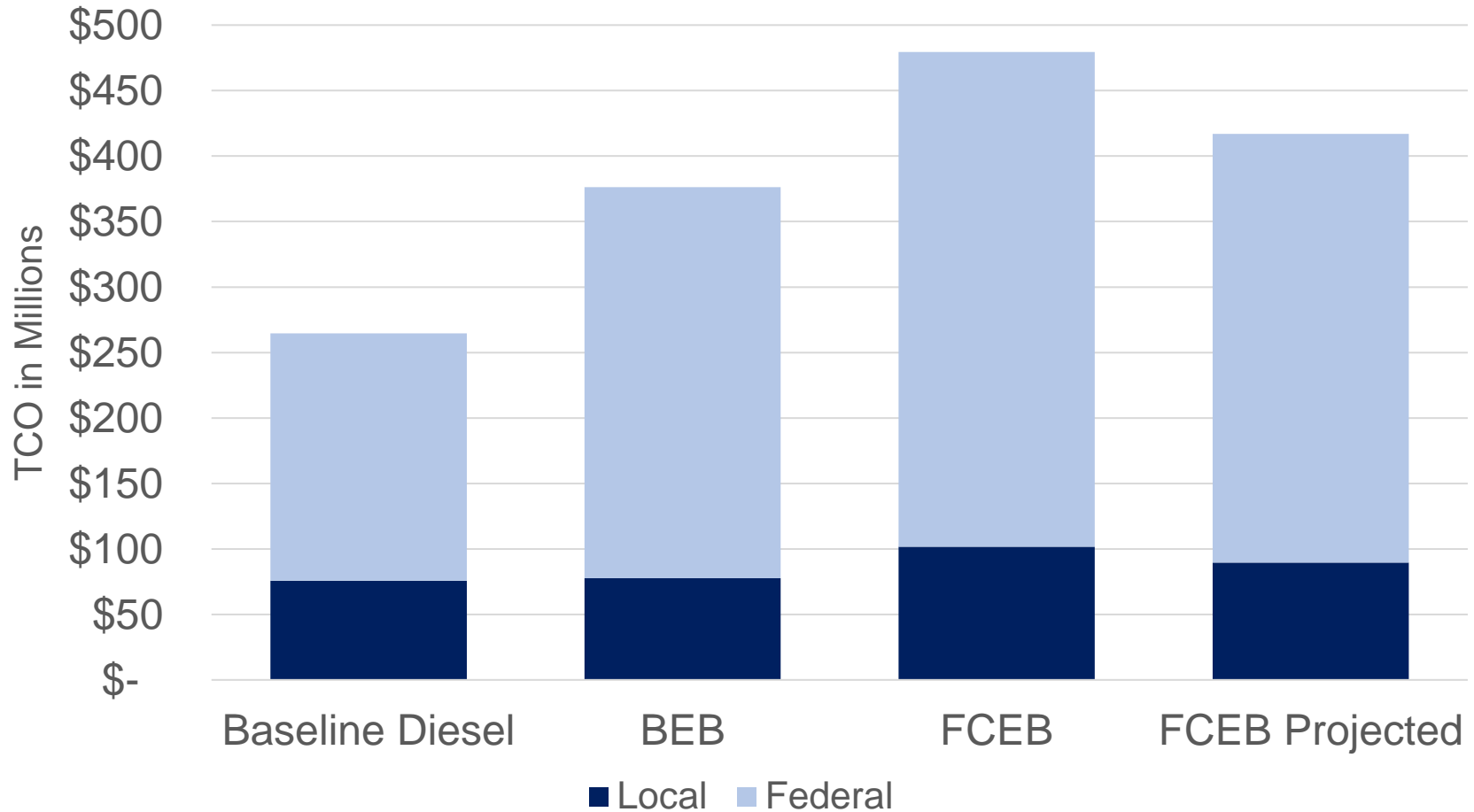
- Vehicle procurement costs
- Fuel/electricity costs
- Maintenance costs
- Infrastructure costs

## ► Cost Shares









- Federal Share
  - From formula and competitive grants
  - Varies by cost type from 50%-90%
- Non-federal Share
  - From agency, state, and other funds
  - Varies by cost type from 10%-50%

# Total Cost of Ownership

## Total Cost of Ownership 2024-2044



# Benefit/Cost Comparison

	Baseline Diesel	Battery Electric (BEB)	Hydrogen (FCEB)
FTA Compliant Vehicle Delivery	18 months	18-24 months	18-24 months
Time to Refuel/Recharge	10 min		
Operational Stability <sup>1</sup>	-		
Maintenance Benefits	-		
Environmental Benefits	-		
Est. Local Share of TCO (20 Years)	\$75 M	+ 3%	+ 34%

<sup>1</sup>Operational stability as compared to baseline represents the variability that battery electric vehicles experience in available power due to environmental and operational factors like ambient temperature, passenger load, terrain, driving style, etc.

# Knowns and Unknowns

## Knowns

- 10 BEBs will join the fleet in 2024
- BEB infrastructure (chargers, maintenance, etc) available at South Ops – could support up to 20 BEBs
- Buy America compliant hydrogen-fueled buses are not yet available for commuter coaches
- Useful life of some of Xpress fleet begins expiring as early as FY26

## Unknowns

- Redefine the Ride analysis may change the mix of Xpress vehicles as well as service profiles of routes
- Overall business case for BEBs vs. FCEBs, including:
  - › Fleet & facility capital + operations costs
  - › Quantitative and qualitative benefits
  - › Potential of Federal funds to achieve parity with diesel
- Implementation factors such as:
  - › Schedules (procurement, construction, utilities coordination, availability of hydrogen fuel, etc.)
  - › Economies of scale with other transit providers
- Xpress's FY25 State budget approp



**Questions?**





**ADJOURN**

**The Regional Technology Committee  
Meeting Will Begin Momentarily**