

Regional Technology Committee

Andy Macke, Chair

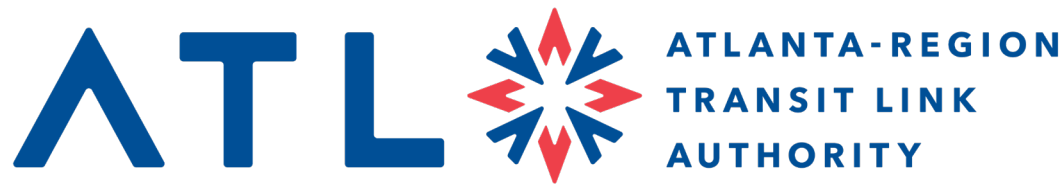
August 3, 2023

Regional Technology Committee Meeting

Thursday, August 3, 2023

Proposed Agenda

- I. Call to Order – Andy Macke, Chair
- II. Approval of the Meeting Minutes for April 6, 2023
- III. Approval of the Agenda for August 3, 2023
- IV. Regional ZEB Fleet Transition Plan Update – Abby Marinelli
- V. Regional Breeze Mobile Pilot Update – Carlos Trias
- VI. Adjournment



Regional ZEB Fleet Transition Plan Update

Abby Marinelli, Programs Manager

August 3, 2023

Why Zero Emission Buses?

Through the Bipartisan Infrastructure Law, FTA is providing **over \$6 billion** in discretionary funds for ZEB deployment.

A ZEB Fleet Transition Plan is required to access these funds.

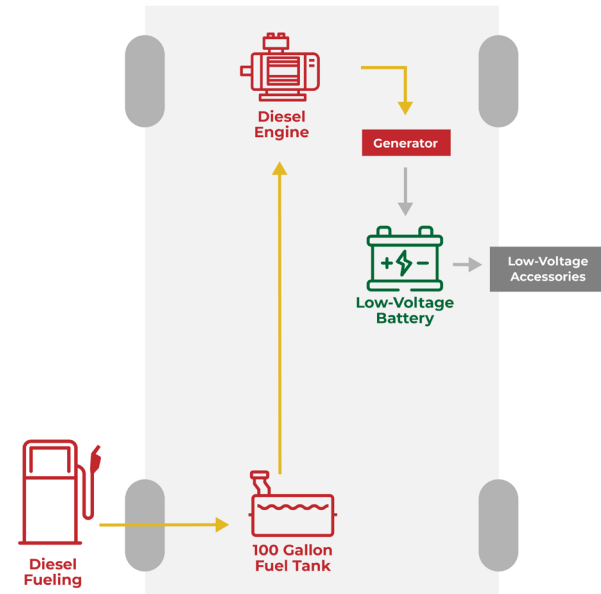
Plan focuses on potential transition opportunities as vehicles are retired at end of useful life.

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.

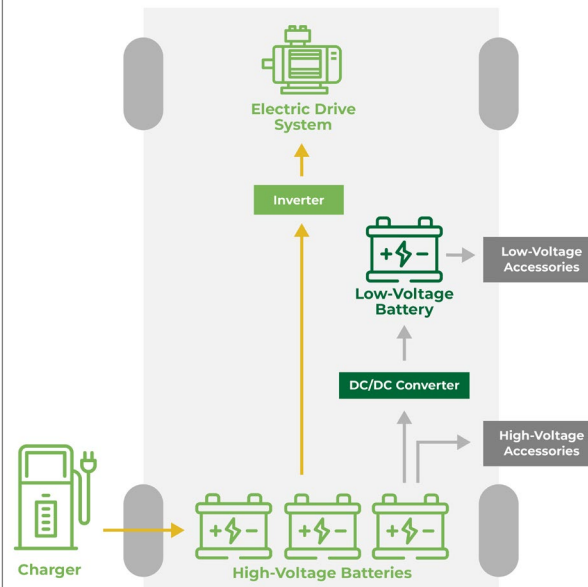
- MARTA is undertaking a separate analysis and those results will be incorporated when available.

Diesel vs. BEB vs. FCEB

DIESEL VEHICLE



BATTERY ELECTRIC VEHICLE



FUEL CELL ELECTRIC VEHICLE

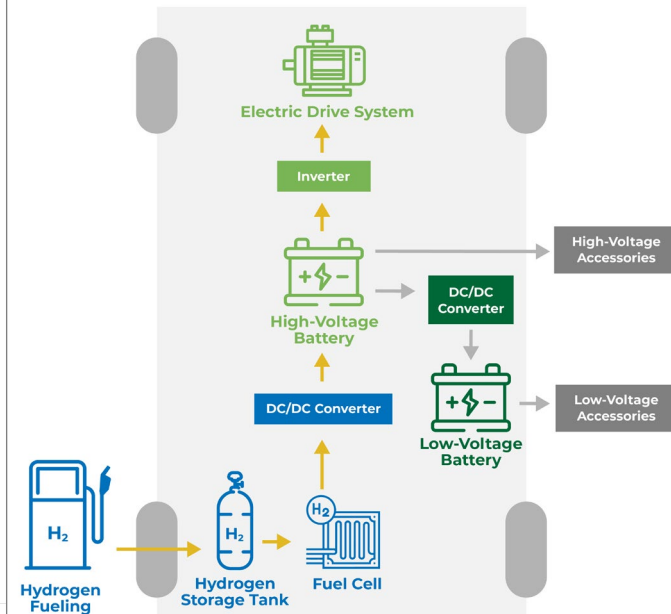
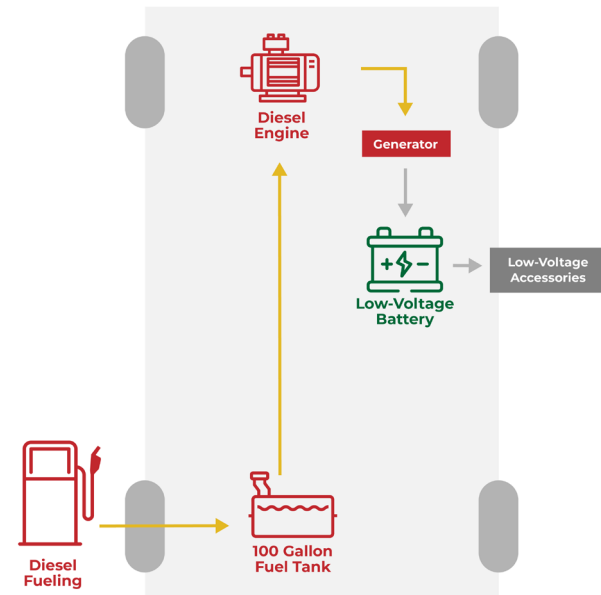


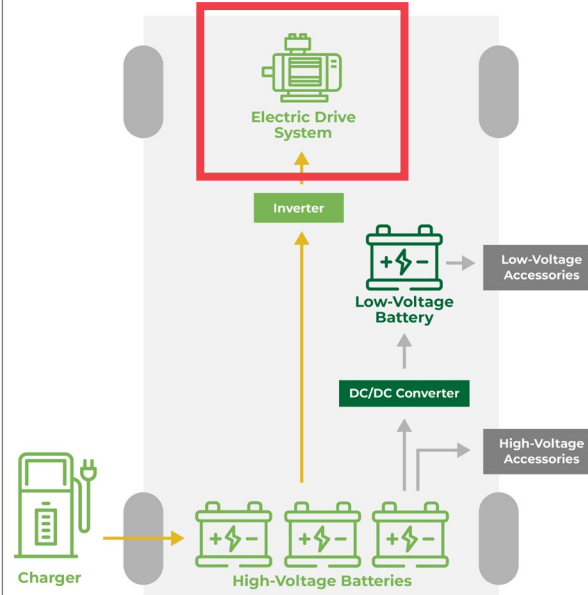
Image source: Center for Transportation and the Environment

Diesel vs. BEB vs. FCEB

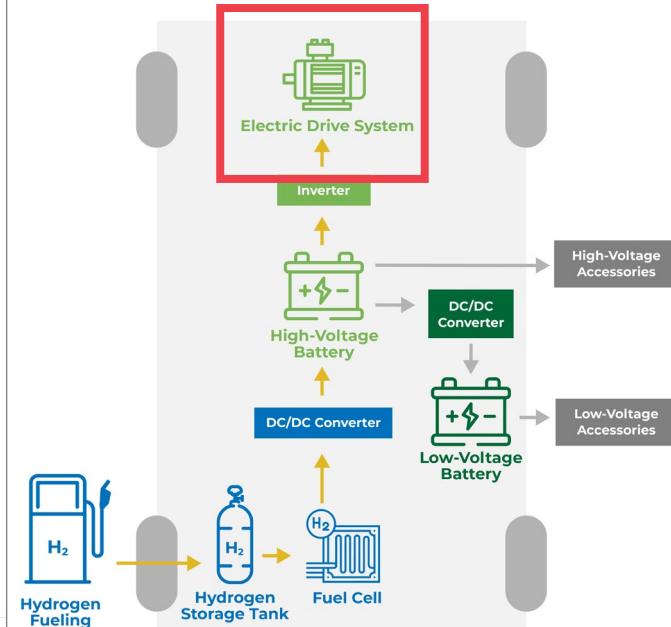
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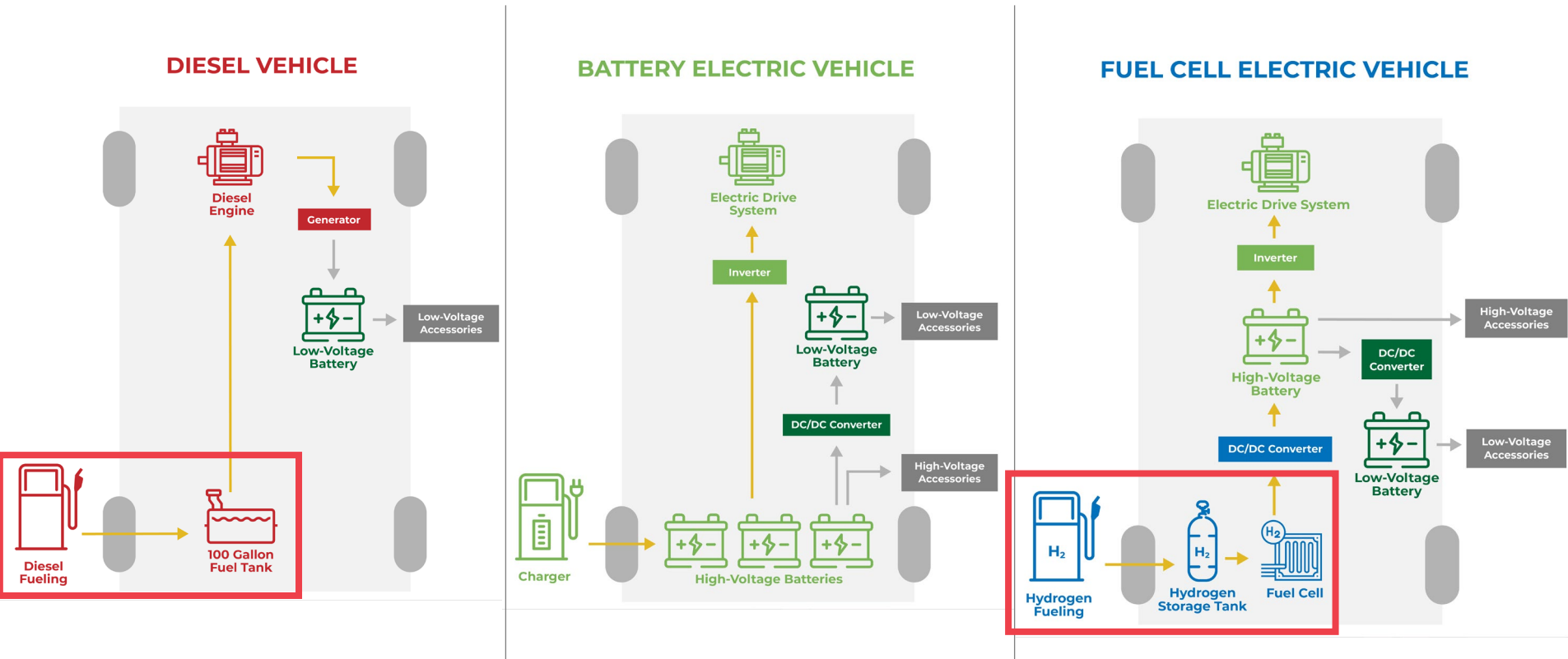
FUEL CELL ELECTRIC VEHICLE



Electric Drive Systems have fewer moving parts than internal combustion engines and therefore require less maintenance over time.

Image source: Center for Transportation and the Environment









Diesel vs. BEB vs. FCEB



Diesel and Hydrogen tanks can refuel in 10 minutes.
BEBs take about 3 hours to recharge.










Image source: Center for Transportation and the Environment

Colors of Hydrogen

	Colour	Fuel	Process	Products
	Brown/Black	Coal	Steam reforming or gasification	H ₂ + CO ₂ (released)
	White	N/A	Naturally occurring	H ₂
	Grey	Natural Gas	Steam reforming	H ₂ + CO ₂ (released)
	Blue	Natural Gas	Steam reforming	H ₂ + CO ₂ (% captured and stored)
	Turquoise	Natural Gas	Pyrolysis	H ₂ + C (solid)
	Red	Nuclear Power	Catalytic splitting	H ₂ + O ₂
	Purple/Pink	Nuclear Power	Electrolysis	H ₂ + O ₂
	Yellow	Solar Power	Electrolysis	H ₂ + O ₂
	Green	Renewable Electricity	Electrolysis	H ₂ + O ₂

Source: Sustainable NI










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*95% of North American Hydrogen is produced using Steam Methane Reformation.

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*95% of North American Hydrogen is produced using Steam Methane Reformation.

*Electrolysis is a viable option for small-scale or onsite production.

Source: Sustainable NI

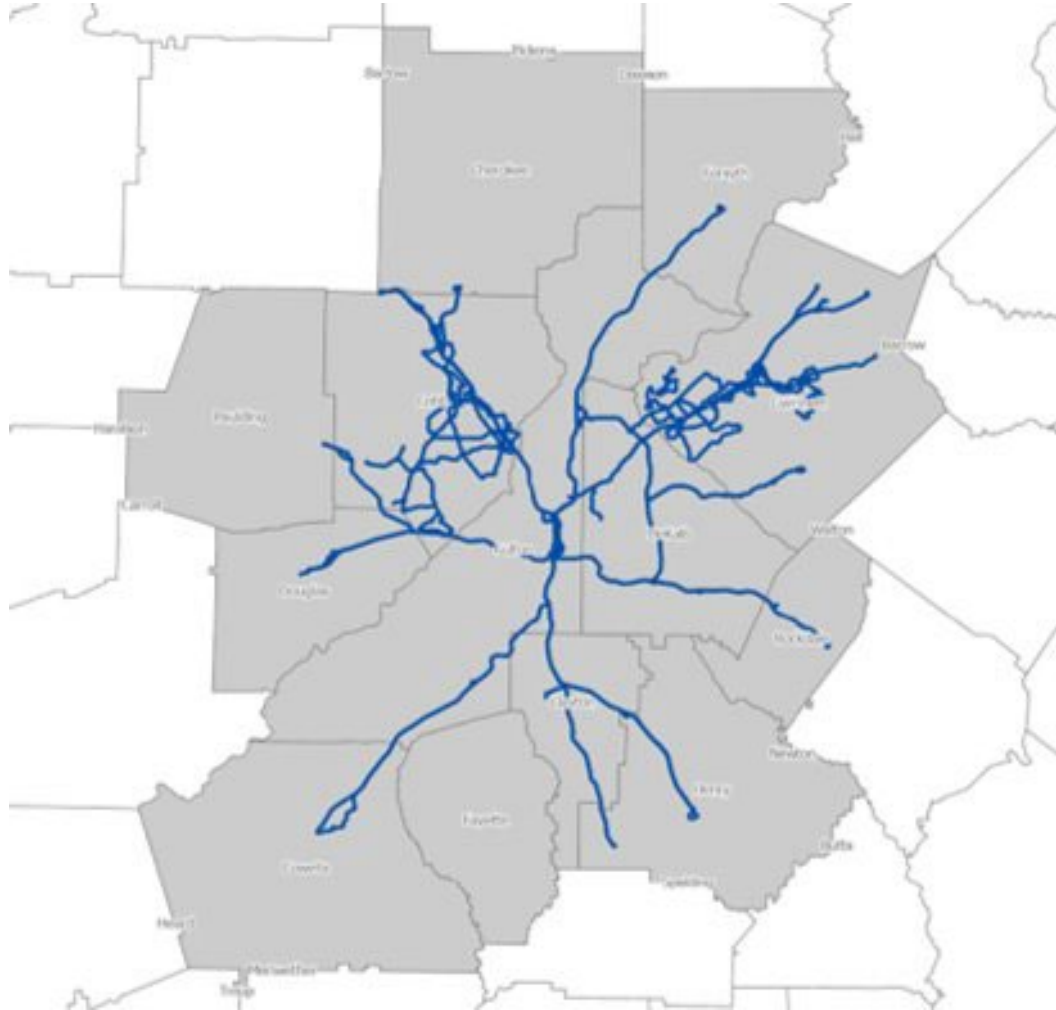
ATL's Project Partners



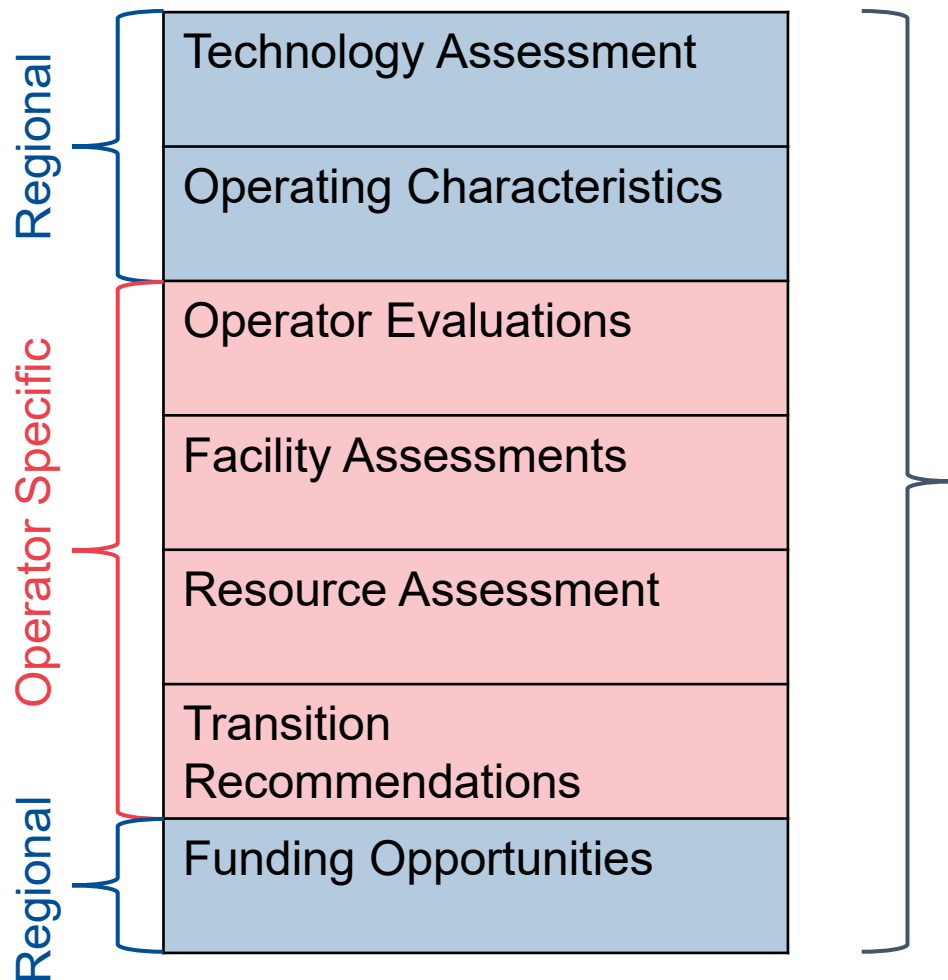
MARTA is undertaking a separate analysis and those results will be incorporated when available.



Routes Considered in ZEB Plan



Scope Elements



Regional ZEB Fleet Transition Plan

Scope Elements

Technology Assessment	<ul style="list-style-type: none">• Review the current ZEB market and likely changes through 2040
Operating Characteristics	<ul style="list-style-type: none">• Operations, maintenance, facility requirements, cost per mile
Operator Evaluations	<ul style="list-style-type: none">• Review current fleet and service• Model charging/fueling for BEB and FCEB
Facility Assessments	<ul style="list-style-type: none">• Analyze existing facilities for suitability to ZEB and recommendations for future facilities
Resource Assessment	<ul style="list-style-type: none">• Calculate Total Cost of Ownership; capital, energy, and training requirements
Transition Recommendations	<ul style="list-style-type: none">• Recommend actions for 10-year transition• Or, transition activities through 2040
Funding Opportunities	<ul style="list-style-type: none">• Identify and assess potential funding sources• Recommend strategies to pursue funding

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Operator Evaluations

Data gathering

- Current fleet (make, model, age, condition, fuel consumption, annual mileage, etc.)
- Current service (routes, topography, passenger load, etc.)

Operator Evaluations

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For all operators in the plan:

Number of buses	>350, 1/3 of region's fleet
Number of routes	54
Annual mileage	>1,000,000 miles
Annual fuel consumption	>250,000 gals

Operator Evaluations

Modeling Route Feasibility

Charging model for all-BEB fleet and charging/fueling model for mixed BEB and FCEB fleet

Operator Evaluations

Modeling Route Feasibility

- Which routes can be served by ZEBs now and in the future?
- Which propulsion type can serve each route in normal and in strenuous conditions?

Vehicle charging requirements assessed for all-BEB fleet and charging/fueling model for mixed BEB and FCEB fleet

Operator Evaluations

Modeling Route Feasibility

- Which routes can be served by ZEBs now and in the future?
- Which propulsion type can serve each route in nominal and in strenuous conditions?

Charging model for all-BEB fleet and charging/fueling model for mixed BEB and FCEB fleet

- Can agencies make a 1-to-1 switch from diesel to ZEB?
- What charging strategy can serve each route?
 - Overnight (low demand) or mid-day (high demand) charging?
 - Can agencies use charge management software to reduce demand-related electricity costs?
- How much hydrogen is required? Can it be produced onsite or trucked in and stored?

Facility Assessment

Engineering analysis of existing depots and facilities

- Current infrastructure layout
- Suitability for ZEB supporting infrastructure
- Suitability for solar panels to potentially offset purchase of grid electricity

BEB Infrastructure

- Chargers
- Charging cabinets
- Appropriate electrical wiring
- Ceiling height

FCEB Infrastructure

- Ventilation
- CSD: Compression, Storage, Dispensing
- Onsite electrolysis

As needed, recommendations for site selection and design considerations for new facilities or depots

Resource Assessment

Procurement Schedule

- Considers multiple scenarios
 - Baseline diesel, all BEB, mixed BEB and FCEB
- Year by year timeline
- Capital requirements

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Fuel/Charging Assessment

- Cost/unit of diesel vs. electricity vs. hydrogen
- Source of fuel/electricity
- Annual cost and cost savings over diesel

Cost per Mile*		
Diesel	BEB	FCEB
\$0.67	\$0.45	\$0.71

*National averages;
hydrogen fuel cost
projected to decline overtime
as the market develops

Resource Assessment

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Cost per Mile*

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Maintenance Assessment

- Cost of routine maintenance
- Midlife overhauls

Cost per Mile*

Diesel	BEB	FCEB
\$1.02	\$0.51	\$0.53

*National averages

Resource Assessment

Procurement Schedule

Fuel Assessment

Maintenance Assessment

Total Cost of Ownership

Resource Assessment

Procurement Schedule

Fuel Assessment

Maintenance Assessment

Total Cost of Ownership

Total Cost of Ownership (TCO)

- Year by Year
- Cumulative Net Present Value

Project Timeline

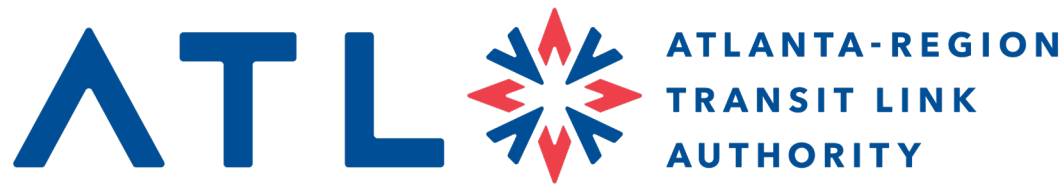
Fall 2022

Fall 2023





Questions?



Breeze Mobile 2.0

Regional Mobile Ticketing Solution

Carlos Trias, Director of Project Management Office

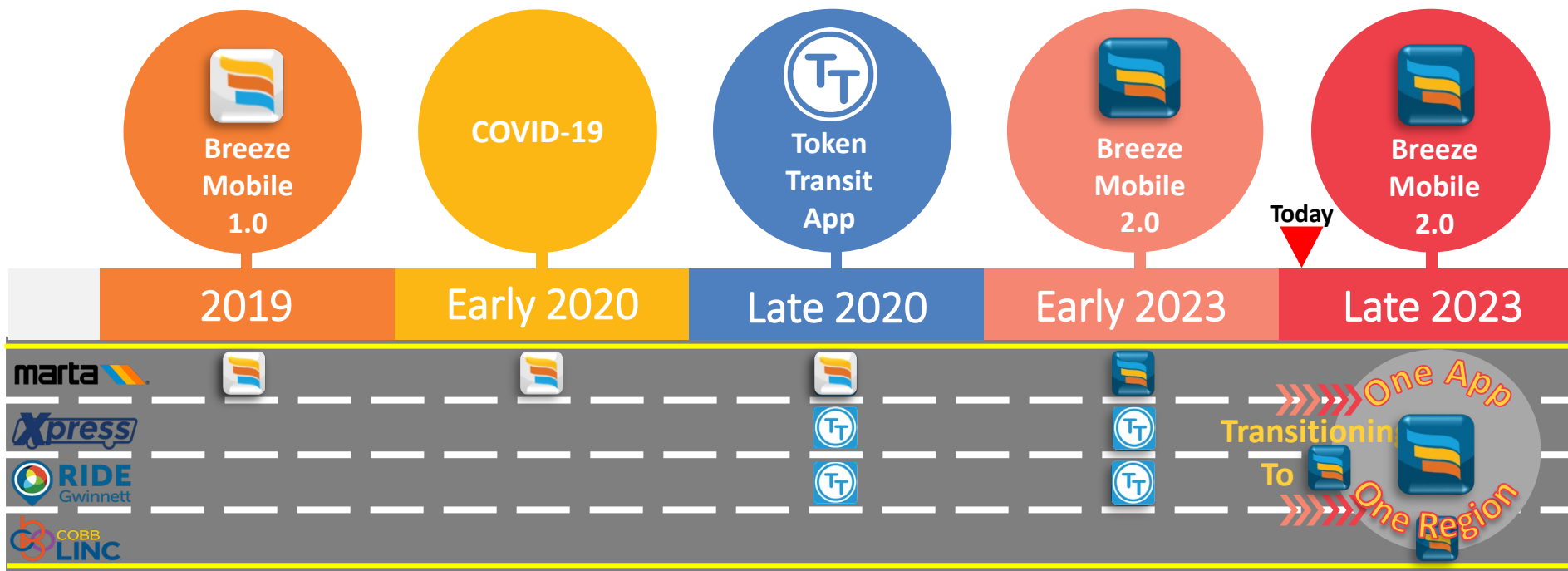
August 3, 2023



AGENDA

- 1. Mobile Ticketing in the Region**
2. Breeze Mobile 2.0
3. Why transition to Breeze Mobile 2.0
4. Regional Implementation
5. Timeline

Mobile Ticketing in the Region



✓ MARTA launched Breeze Mobile 1.0 which was not ready for regional deployment

✓ Transit Operators look for contactless payments to help reduce the spread of COVID-19

✓ Breeze Mobile 1.0 was not ready for regional deployment

✓ Xpress and Ride Gwinnett launch the Token Transit mobile app as a response to COVID-19

✓ Cobb waits for Breeze Mobile 2.0 to be ready for regional deployment

✓ MARTA upgraded to Breeze Mobile 2.0 which is now ready for regional deployment

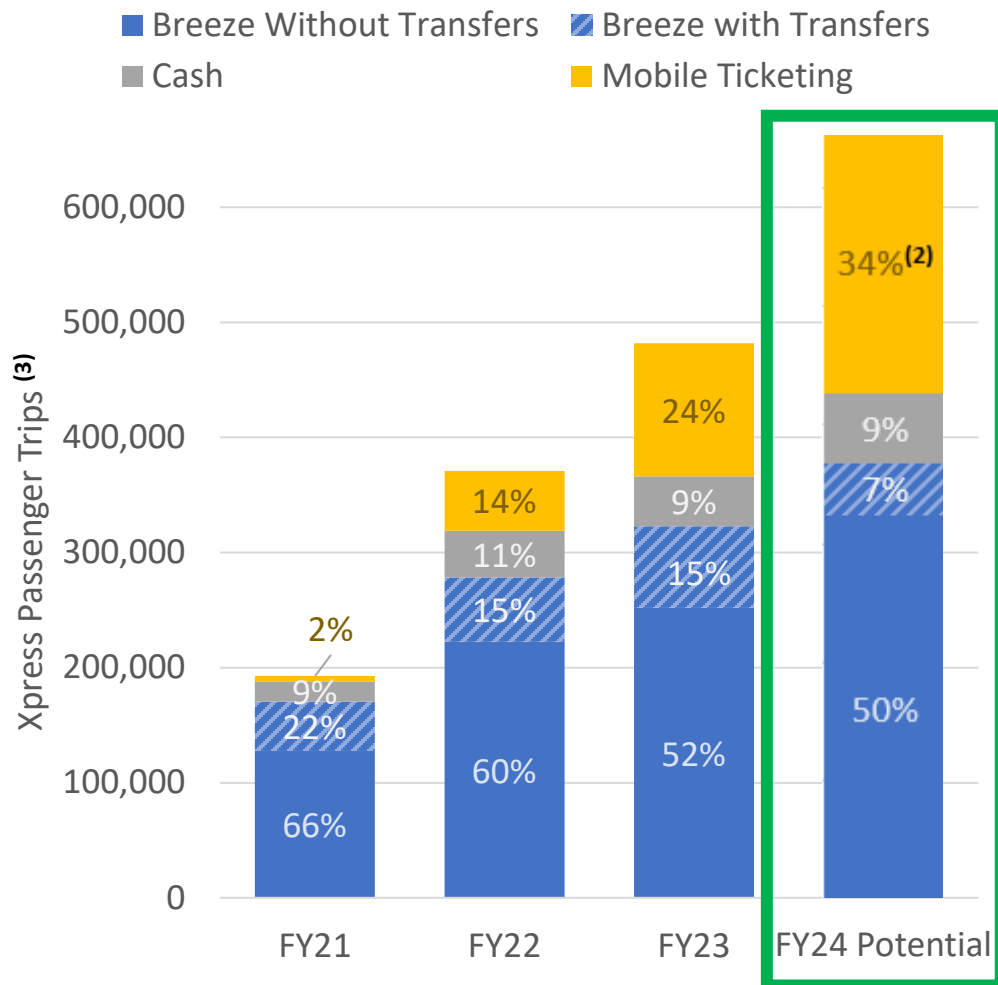
✓ ATL Xpress, CobbLinc and Gwinnett joins Breeze Mobile 2.0

✓ One single mobile app allows riders to seamlessly use and pay for transit services throughout the region



Xpress & Mobile Ticketing Adoption

Approximate Percent of Xpress Utilization
by Fare Media⁽¹⁾



Usage of the Token Transit mobile app has grown steadily since FY21

Transfers are not supported on the current Token Transit mobile app

With Breeze Mobile 2.0 supporting transfers between transit operators, it is expected to see higher mobile ticketing utilization rates as some of the riders stop using breeze cards to transfer and start using the Breeze Mobile 2.0 app

(1). Current fare media includes Breeze cards, mobile ticketing, and cash. Xpress magnetic cards were phased out in FY19.

(2). During FY24 transition year, Mobile Ticketing will include both Token Transit and Breeze Mobile 2.0.

(3). Xpress passenger trips for FY21-23 represent actuals, FY24 shows projections.



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Breeze Mobile 2.0 – Video



Breeze Mobile 2.0 – Main Features

Ready for regional deployment

- Supports transfers between transit operators
- Supports regional and operator specific fare products
- MARTA collects payments and clears revenue between transit operators

Supports contactless technologies

- Near Field Communications (NFC)
- Barcodes

Account based system

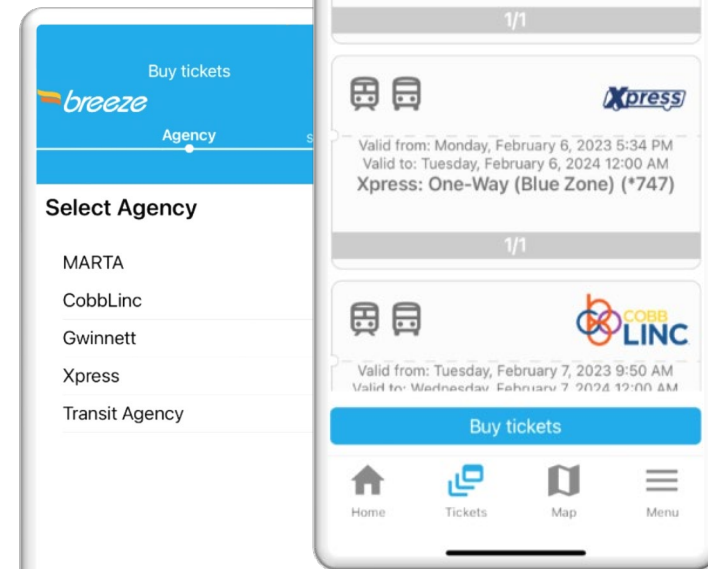
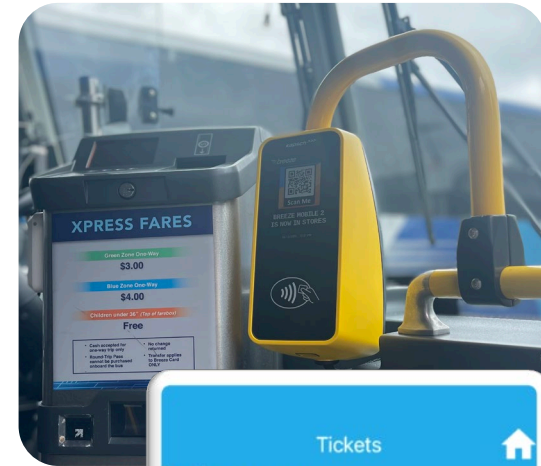
- Cellphone, smartcards, contactless bank card, smart watch, or any NFC-enabled device can be linked

Expanded payment options

- Credit/debit card, Apple Pay, Google Pay
- Pay as you go











Open payment ready

- Contactless bank card payments



Token Transit vs Breeze Mobile 2.0



Features	Token Transit	Breeze Mobile 2.0
Supports smartphones as fare media, and accepts bank cards as payment method		
Regional Ready – Supports transfers between transit operators		
Supports other contactless fare medias – smartcards, smartwatch, and any other NFC-enabled media		
Supports complex fare structures and business rules (e.g., fare upcharges)		
Equipment ready to accept contactless bank cards (Open Payment)		



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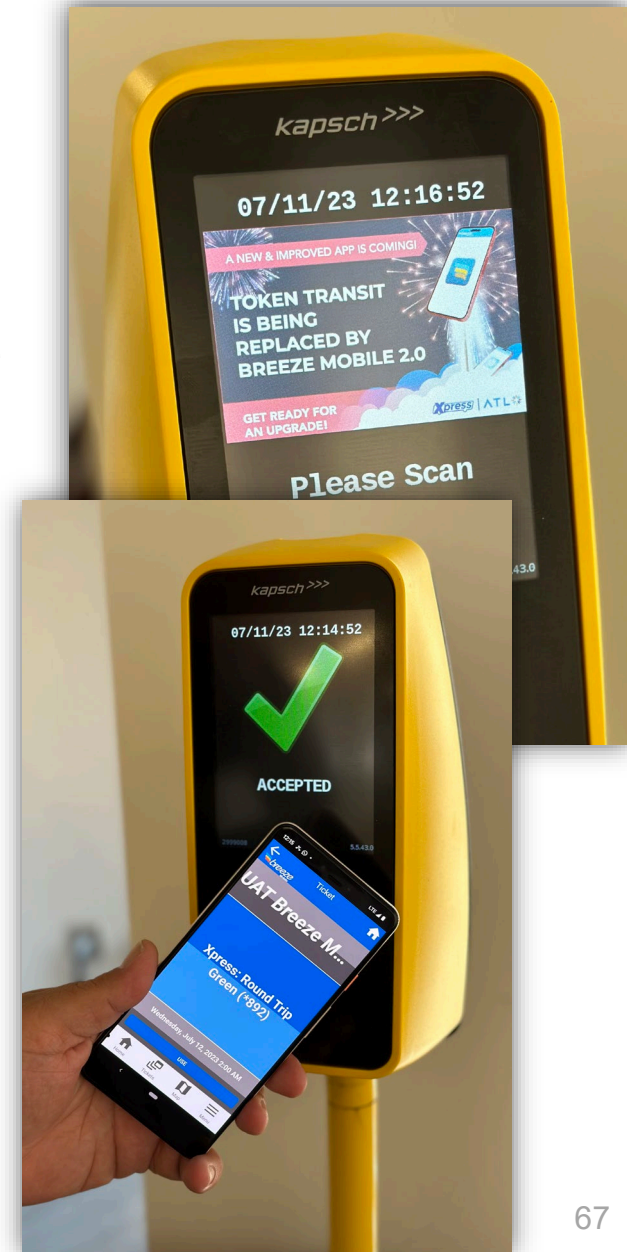
Why transition to Breeze Mobile 2.0?

Benefits to riders → Enhanced experience:

- One app to pay for and seamlessly transfer between transit services in the region
- It's easy, quick and convenient: download, buy tickets and tap/scan
- No need to carry a Breeze card for travel, just use your cellphone or any other NFC-enable device
- Multiple payment options
- Self-managed account

Benefits to transit operators:

- Enhanced customer experience may return in higher adoption and increased customer satisfaction
- Future proof the region for fare collection technology
- Affordable. Little upfront investment required.
- Expanded options for more complex fare structures





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Regional Implementation for Breeze Mobile 2.0



ARC awarded \$2.1 million to ATL for 80% federal funding share of the Breeze Mobile 2.0 regional implementation (MARTA excluded)

- 20% match being shared by Xpress, Cobb, and Gwinnett
- MOUs have been executed between the three parties

ATL holds a master contract with Breeze Mobile 2.0 provider (Kontron) on behalf of Cobb and Gwinnett.
Task Orders have been issued for each transit operator

ATL is managing and coordinating the implementation of Breeze Mobile 2.0 for Xpress, Cobb and Gwinnett

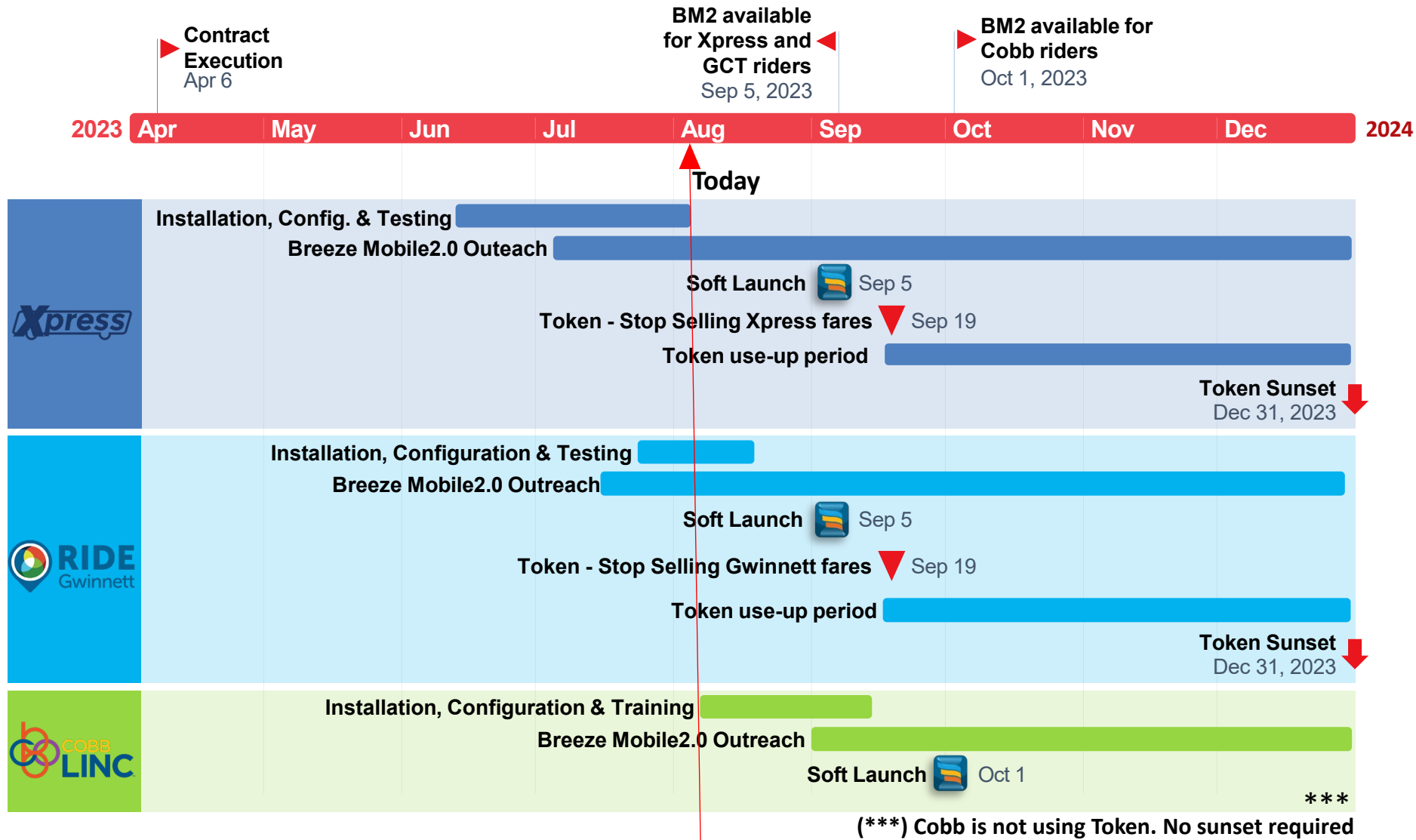
ATL will continue to explore the possibility of additional metro-Atlanta transit operators joining Breeze Mobile 2.0



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Regional Implementation - Timeline





Questions





ADJOURN

**The Regional Transit Planning Committee
Meeting Will Begin Momentarily**