



Board of Directors

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AGENDA

Board of Directors

Tuesday, June 4, 2024

IN-PERSON MEETING/REMOTE

5:30 PM

To join the meeting [Register Here](#)

(connect using either Chrome or Firefox web browser)

Or listen by phone: 720-928-9299

Webinar ID: 878 7658 5517#

Passcode: 1660#

Study Session

Chaired by Erik Davidson

A. Call to Order

B. Discussion Item

- Facilities and Fleet Transition Plan

C. Other Matters

D. Adjourn

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THE CHAIR REQUESTS THAT ALL CELL PHONES BE SILENCED DURING THE BOARD OF DIRECTORS MEETING FOR THE REGIONAL TRANSPORTATION DISTRICT.

BOARD OF DIRECTORS DISCUSSION ITEM

Facilities and Fleet Transition Plan

Committee Meeting Date:

June 4, 2024

STAFF REPRESENTATIVE

Fred Worthen, Assistant General Manager, Bus Operations

PRESENTATION LENGTH

30 minutes

BACKGROUND

Environmental Sustainability

The Board of Directors has collectively demonstrated a deep and abiding commitment to addressing the climate impacts of the agency's services, programs, and initiatives throughout the Denver metro region, both in terms of operating and administrative facilities as well as the existing fixed-route bus fleet.

First among RTD's Board-adopted Strategic Plan Priorities is Community Value, which states: "RTD strives to be a community partner, providing value to customers as well as to the broader Denver metro region while sustaining planet Earth."

In support of this priority, the agency is committed to supporting local, state, and national efforts to mitigate to the extent feasible the impacts of greenhouse gas (GHG) emissions, including those derived from operating and administrative facilities, as well as fixed-routes buses.

Current Bus Facilities

RTD currently owns and directly provides transit services from three bus division facilities across the service area. The Platte, East Metro, and Boulder facilities were purpose-designed in the late 1970's for a diesel fleet and became operational in the early 1980's. Over the years, these facilities have been modified to accommodate diesel bus fleet replacements and upgraded to current building codes. These facilities meet RTD's transit service delivery requirements.

Current Diesel Bus Fleet

RTD's current fixed-route bus fleet includes more than 1,000 clean-diesel vehicles, which are operated by RTD directly and by contractors. Given the size of the current fleet; the typical useful service life of diesel buses as well as federal minimum (12-year/500,000 mile) service-life requirements; and the magnitude of the facilities enhancements that will be required to house, maintain, and support alternatively fueled transit vehicles, the transition toward lower-emission and zero-emission buses is a significant undertaking that will require many years to fully implement.

Alternatively Fueled Buses

RTD was an early adopter of low/no emission technologies. The agency's first steps toward a low/no-emission bus fleet transition were taken in 2000, with the deployment of hybrid electric/compressed natural gas (CNG) buses along the 16th Street Mall. A subfleet of hybrid diesel/electric fixed-route buses followed in 2008. The CNG-powered MallRide buses were also later replaced by a fleet of 36 zero-emission battery electric buses (BEBs) in 2017. The agency has garnered operational knowledge through the deployment and maintenance of these low- and no-emission vehicles, as well as industry best practices and lessons learned, both by RTD and other public transit service providers throughout North America and globally.

Transition Planning

On April 25, 2023, the RTD Board of Directors passed a motion to approve the summary scope of work for a solicitation, and to subsequently authorize the General Manager and CEO to enter into a contract, for consulting services for the development of a holistic Low/No Emission Facilities and Fleet Transition Plan (Plan) compliant with the Bipartisan Infrastructure Law (BIL), Pub. L. 117-58, in an amount not to exceed \$10,000,000.

Following the Board action, the agency subsequently released a solicitation on May 23, 2023, to select a consultant to lead the planning process. After reviewing proposals from five qualified firms, WSP USA, Inc. was selected to lead the Plan. On August 24, 2023, RTD executed a contract with WSP USA, Inc. to complete the Plan, and the project kicked off shortly after.

DISCUSSION

This Study Session will set the project context for the Plan, provide an overview of key concepts related to low and no emission facilities and fleets, discuss why it is important to approach this transition with a "facilities first" strategy, discuss transition plan considerations, and provide several case study examples from other transit agencies that have implemented similar transition plans.

FINANCIAL IMPACT

There is no financial impact associated with this discussion item.

ATTACHMENTS:

- FFTP_Board Study Session Presentation (PPTX)

Prepared by:

Charlie Stanfield, Planning Project Manager

Approved by:


Fred Worthen, Assistant General Manager of Bus Operations 5/31/2024

Authorized by:


Debra A. Johnson, General Manager and CEO 5/31/2024



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Through Connections.

Board Study Session

Facilities and Fleet Transition Plan (FFTP)

June 4, 2024

Overview

- § Project Context
- § Concepts and Terminology
- § Facilities First Strategy
- § Considerations
- § Case Studies
- § Next Steps

Acronyms

SOP: Service Optimization Plan

BRT: Bus Rapid Transit

GHG: Greenhouse Gas

Fuel Types:

CD: Conventional Diesel

CNG: Compressed Natural Gas

DHEB: Diesel Hybrid-Electric Bus

BEB: Battery Electric Bus

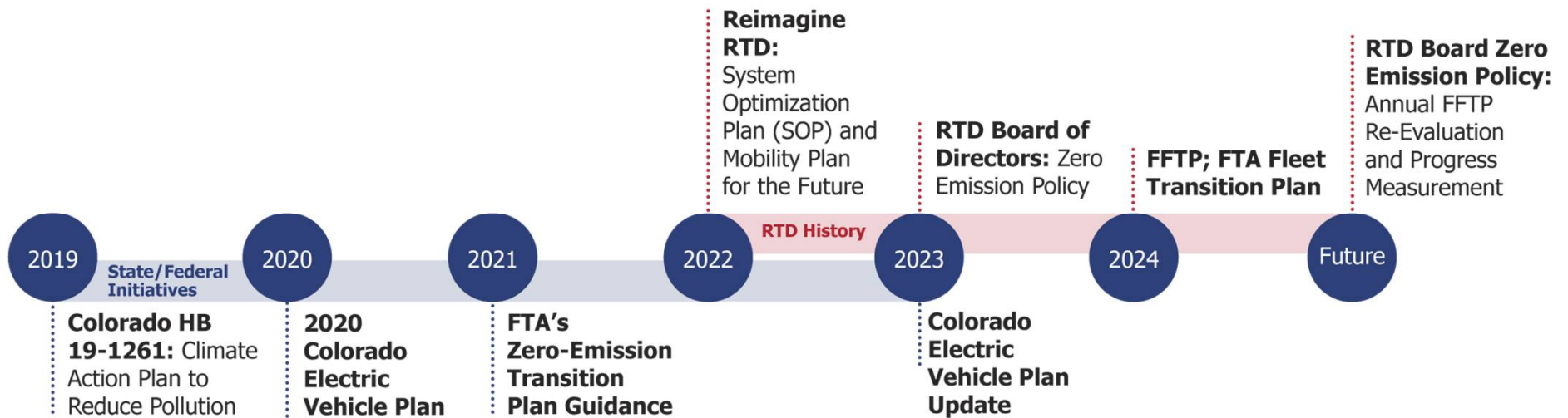
FCEB: Fuel Cell Electric Bus



Project Context

Facilities and Fleet Transition Plan (FFTP)

Historical Context



RTD shall achieve net zero emissions **by 2050** (*RTD Board Zero Emission Policy, 2023*)



Facilities and Fleet Transition Plan (FFTP)

FFTP Vision Framework

Goals

Achieve **net zero emissions** from RTD's facilities and fleet by 2050.

Achieve and maintain a **state of good repair** (SOGR) for 100% of RTD facilities.

Guiding Principles



Community Value
Partnerships. Sustainability.



Customer Excellence
Service Quality. Equity.



Employee Ownership
Opportunity. Safety.



Financial Success
Stewardship. Assets.

Parameters



Facilities

- Transit Asset Management alignment
- Infrastructure compatibility with future fuels/technologies
- Maximize long-term facility transition needs
- Regulatory compliance



Bus Fleet

- 1:1 bus fleet replacement
- Service Optimization Plan (SOP) and DRCOG Transportation Plan alignment



Overall

- Employee growth constellations
- Fiscal accountability
- Favorable customer experience
- Operational effectiveness and efficiency

FFTP Vision Framework: Goals

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FFTP Vision Framework: Guiding Principles

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Bus Fleet

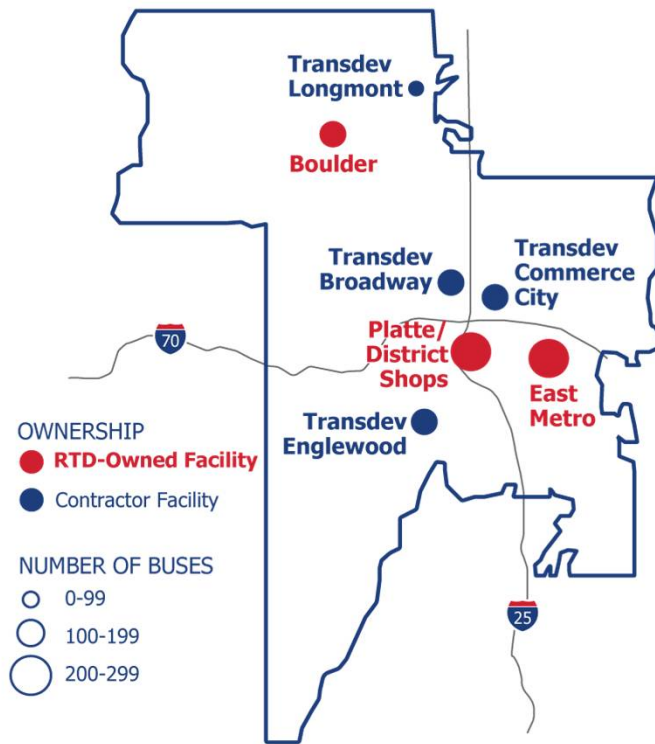
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Bus Facilities and Fleet









 **Current Bus Fleet**
1,019 buses

 **983** diesel

 **36** battery electric

 **9 Routes**
More than **100** bus routes

Service Optimization Plan (SOP) Impacts

	EXISTING REVENUE SERVICE	SOP REVENUE SERVICE	PERCENT CHANGE
 Bus Needs*	458 buses	563 buses	16% ↑
 Total Daily Miles	91,937 miles	95,242 miles	4% ↑
 Miles Per Vehicle	190 miles	169 miles	-11% ↓
 Total Daily Bus Hours	7,127 hrs	7,587 hrs	6% ↑
 Hours Per Vehicle	15 hrs	13 hrs	-8% ↓
 Average Speed (mph)	13 mph	13 mph	no change

*Does not include spares

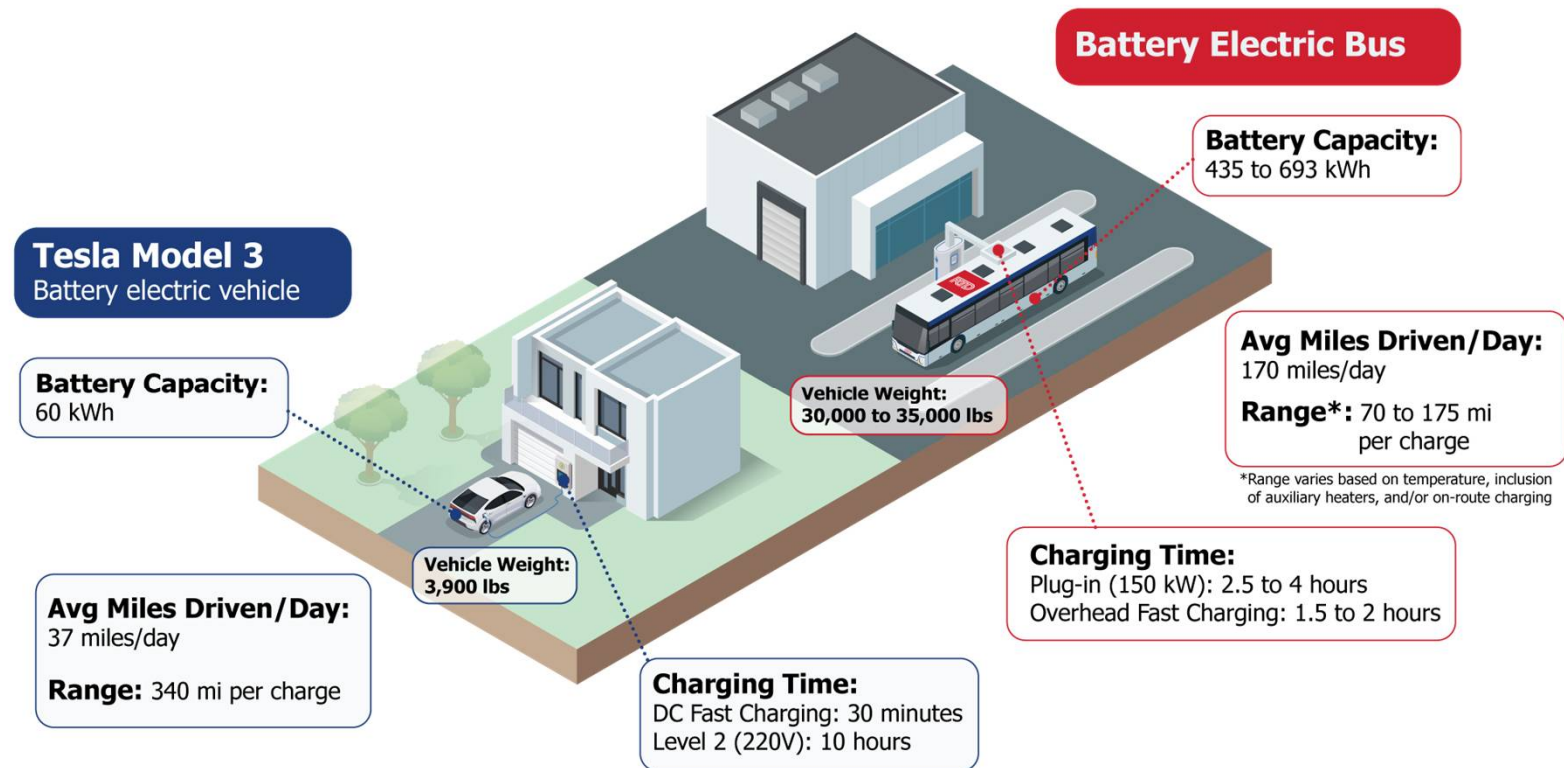
The SOP (with gradual implementation through 2026) recommends modifications to routes to **best meet the region's near-term mobility needs** within the existing workforce and financial constraints.



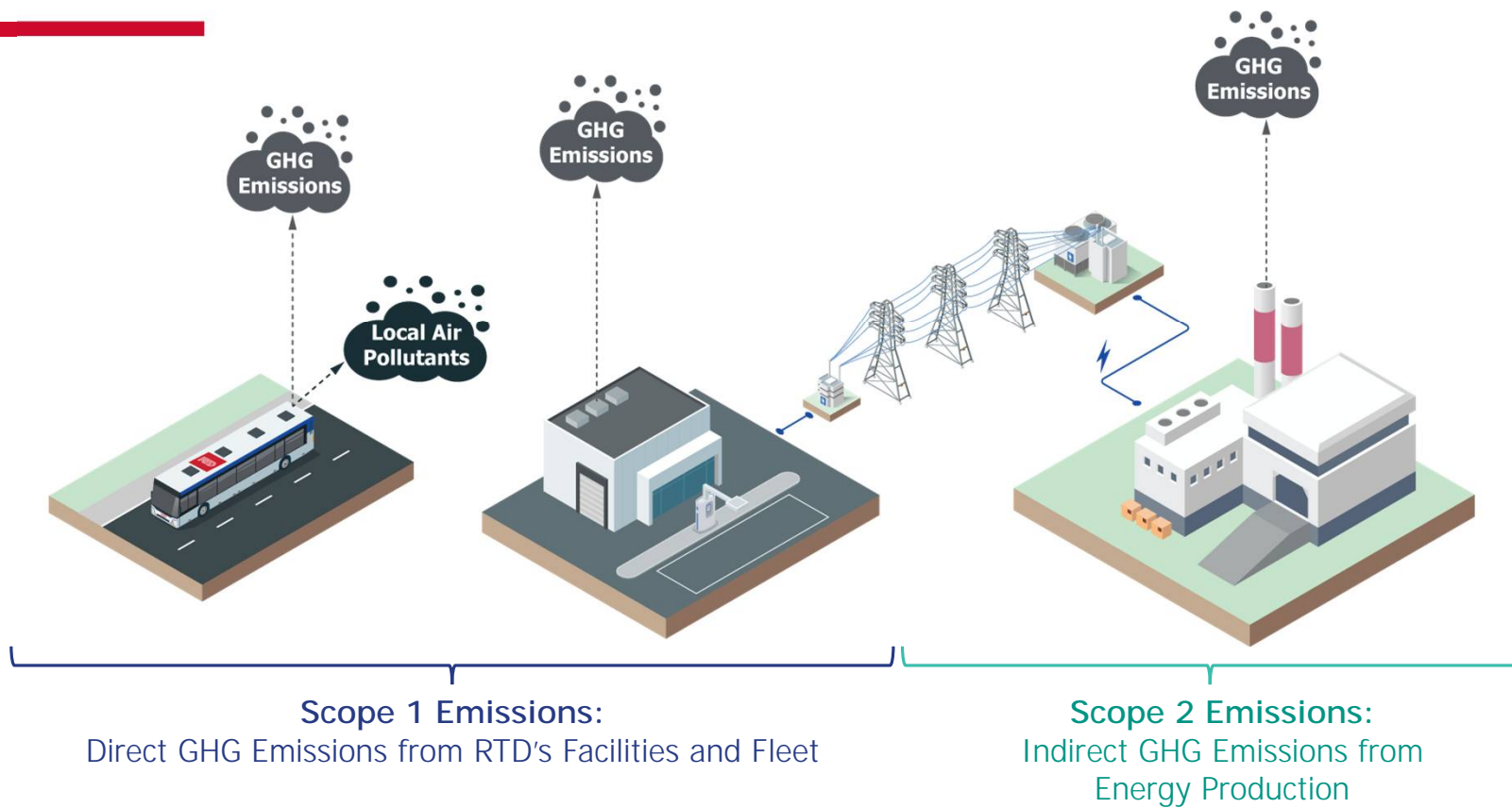
Concepts and Terminology

Facilities and Fleet Transition Plan (FFTP)

A Bus is Not a Tesla



Scope 1 and Scope 2 Emissions

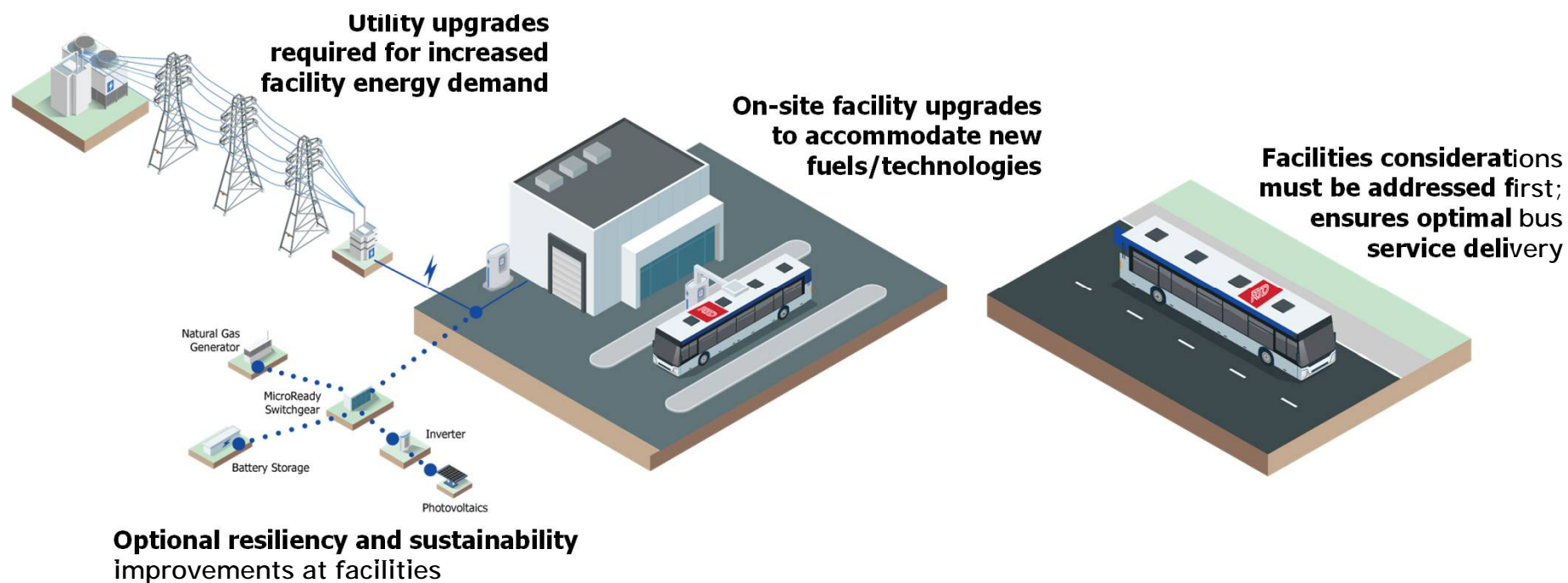




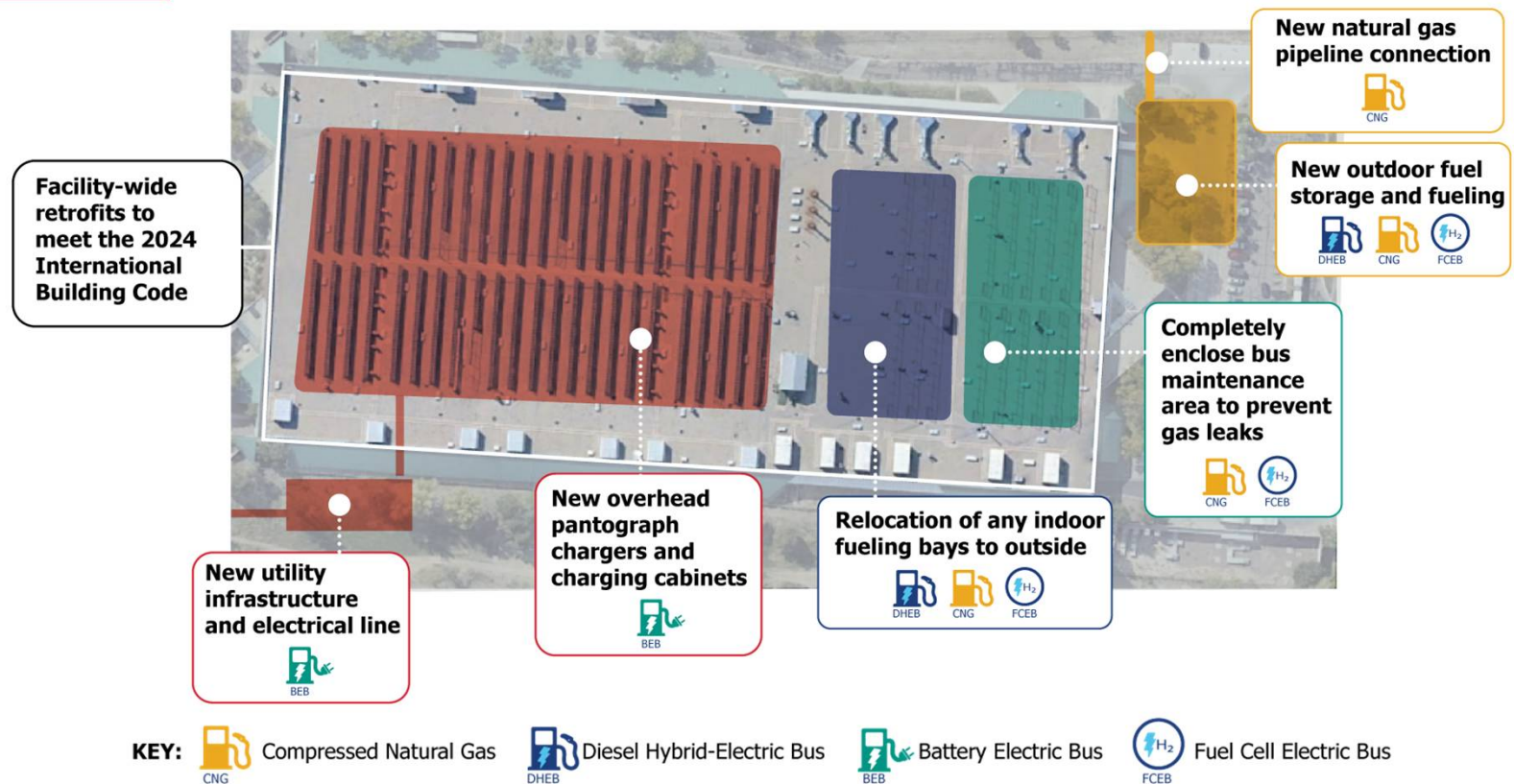
Facilities First Strategy

Facilities and Fleet Transition Plan (FFTP)

Facilities First Strategy



RTD Facility Upgrade Example: East Metro





Considerations

Facilities and Fleet Transition Plan (FFTP)

Key Considerations



Fuel/Technology Selection

No panacea for fuel/technology selection



Transit Bus Manufacturing Challenges

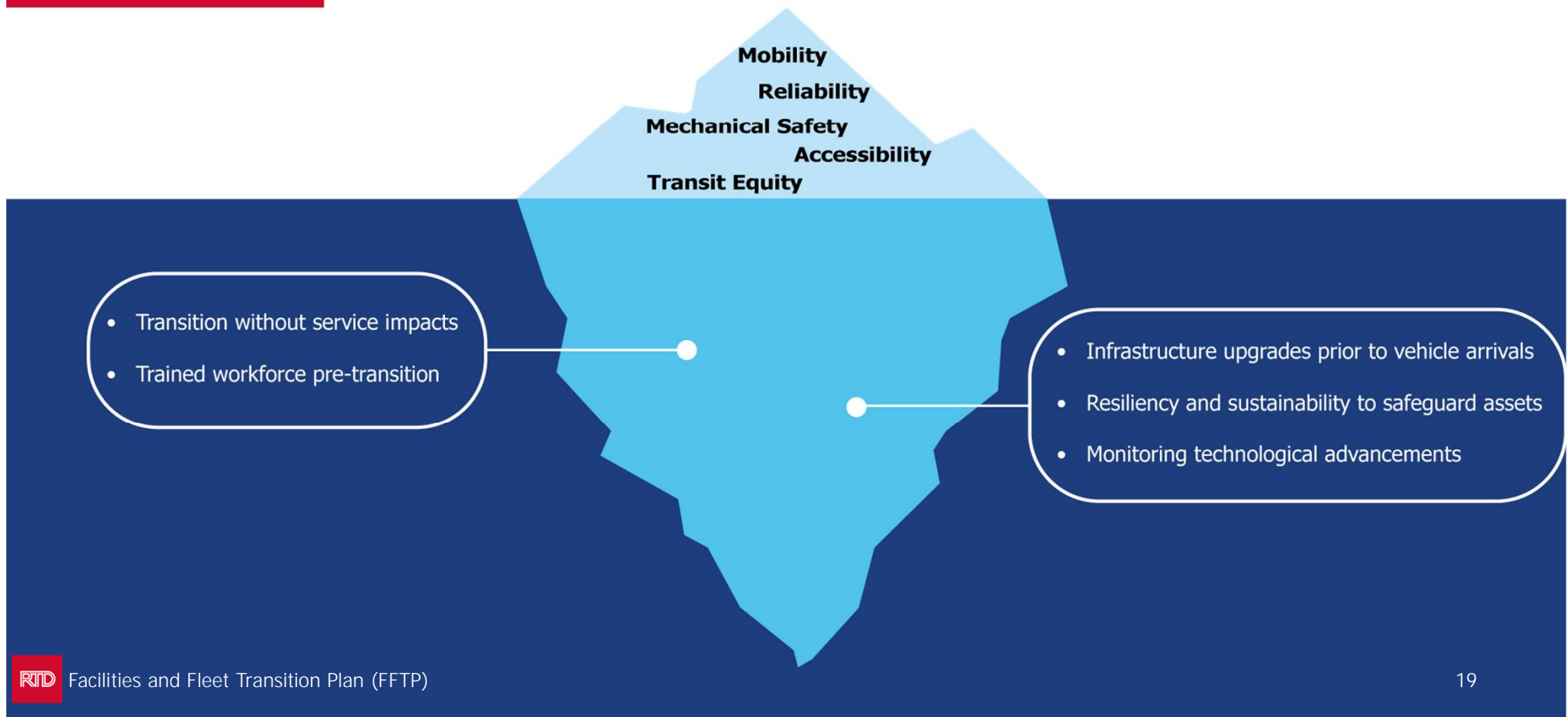
Two original equipment manufacturers (OEMs) compared to ten a decade ago
APTA Bus Manufacturing Task Force; Buy America; standardization



Facilities First Strategy is Paramount

Fuel/technology selection will have a significant impact on facilities
Energy requirements evolve as the fleet grows

Customers/Stakeholders Only See the Tip of the Iceberg

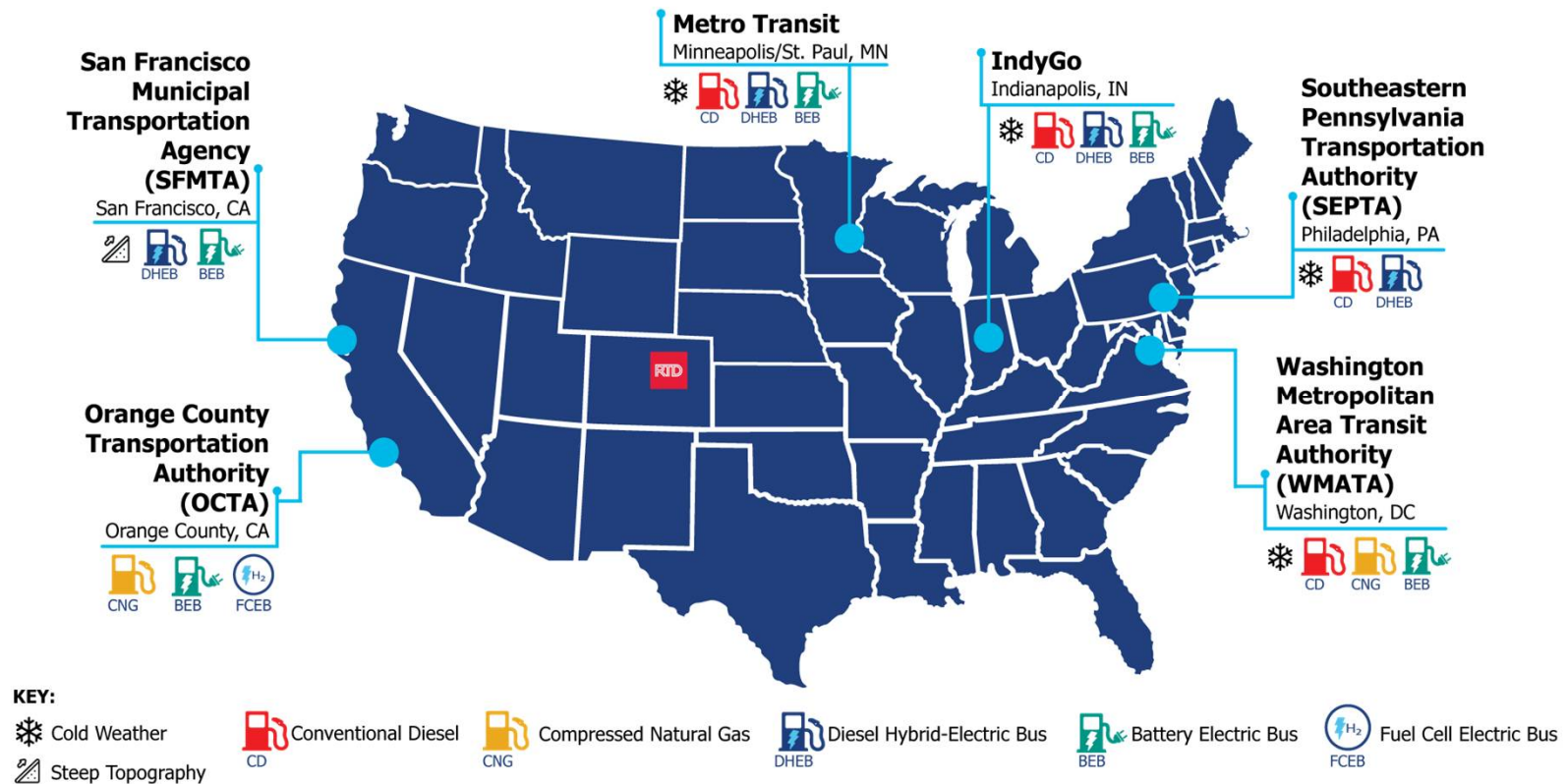




Case Studies

Facilities and Fleet Transition Plan (FFTP)

Case Study Overview





Facilities and Fleet Transition Plan (FFTP)

IndyGo

Indianapolis, IN



- § **Agency Overview:** One facility, 230 buses; 396 sq. mi. service area in Indianapolis/ Marion County, IN
- § **Goal:** Near-zero by 2040 (moving target for ZE) (Board Adopted Policy)
- § **Preferred Technology:** DHEB/BEB
- § **Current Status:** One BRT line electrified, plans to electrify two more
- § **Lessons learned/key takeaways:** Performance-based specs, phased transition approach



Facilities and Fleet Transition Plan (FFTP)

Metro Transit

Minneapolis/St. Paul, MN



- § **Agency Overview:** Five facilities, 850 buses; 900 sq. mi. service area in Minneapolis/St. Paul and five surrounding counties
- § **Goal:** Short-term goal of 20% of 40' fleet will be electric by 2027; medium-term and long-term bus procurement goals driven by KPIs and available budget (State Mandated Zero-Emission Bus Plan)
- § **Preferred Technology:** BEB
- § **Current Status:** BEB revenue service on METRO C Line since 2019; facility design; deployment of 25 new BEBs for revenue service by 2026
- § **Lessons Learned/Key Takeaways:** Phased transition approach; equity and environmental justice prioritization for BEB deployment

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RTD

Facilities and Fleet Transition Plan (FFTP)

SEPTA

Philadelphia, PA



- § **Agency Overview:** Eight facilities, 1,400 buses; 844 sq. mi. service area in Philadelphia and four surrounding counties
- § **Goal:** All ZE fleet by 2040 (Board Adopted Policy)
- § **Preferred Technology:** BEB/FCEB
- § **Current Status:** Retired last diesel-only buses in April 2024; fleet is now completely hybrid electric and BEB; pilot approved for ten FCEB buses; designing facilities
- § **Lessons Learned/Key Takeaways:** Early adoption has its risks; mixed fleet is likely solution

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Facilities and Fleet Transition Plan (FFTP)

WMATA

Washington, DC Metro Area



- § **Agency Overview:** Ten facilities, 1,600 buses; 1,350 sq. mi. service area in Washington, DC and seven surrounding counties/cities
- § **Goal:** All ZE fleet by 2045 (Board Adopted Policy)
- § **Preferred Technology:** BEB/FCEB
- § **Current Status:** BEB and FCEB pilots; ZEB Transition Plan (2023) first two BEBs in revenue service (2023); designing facilities
- § **Lessons Learned/Key Takeaways:** Emphasis on workforce training, phased transition approach, CNG considerations (tank expirations, ranges, useful life)



RTD

Facilities and Fleet Transition Plan (FFTP)

SFMTA

San Francisco, CA



- § **Agency Overview:** Six facilities, 850 buses; 49 sq. mi. service area in the City and County of San Francisco
- § **Goal:** All ZE fleet by 2040 (State Mandate)
- § **Preferred Technology:** BEB
- § **Current Status:** Piloted BEBs in 2022, and ten BEBs are now in revenue service; designing facilities
- § **Lessons Learned/Key Takeaways:** Test the technology (first), master planning importance (space constraints), utility coordination (PG&E, Hetch Hetchy Power)



RTD

Facilities and Fleet Transition Plan (FFTP)

OCTA

Orange County, CA



- § **Agency Overview:** Five facilities, 760 buses; 435 sq. mi. service area in Orange County
- § **Goal:** All ZE fleet by 2040 (State Mandate)
- § **Preferred Technology:** BEB/FCEB
- § **Current Status:** Piloting technology (BEB and FCEB)
- § **Lessons Learned/Key Takeaways:**
Technology neutrality, phased transition approach

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Next Steps

Facilities and Fleet Transition Plan (FFTP)

Key Takeaways



Fuel/Technology Selection

No panacea for fuel/technology selection



Transit Bus Manufacturing Challenges

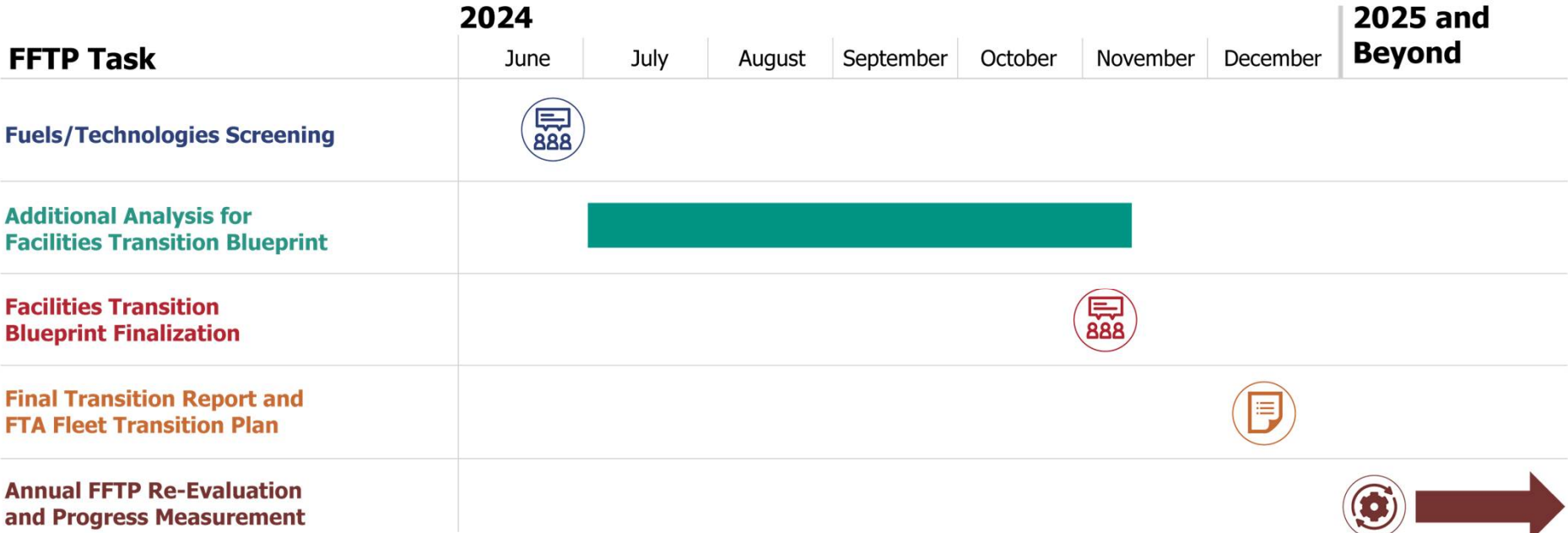
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Next Steps



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