



## Overview

This report outlines the key findings from interviews conducted with peer transit agencies, the potential costs associated with a zero-emission fleet transition, and the critical topics that need to be evaluated to set a policy goal for a potential low- or no- emission fleet transition.

## Definitions:

- BEB:** Battery Electric Bus
- FCEB:** Fuel Cell Electric Bus
- ZEB:** Zero-Emission Bus



Source: National Academies of Sciences, Engineering, and Medicine. 2021. Guidebook for Deploying Zero-Emission Transit Buses.

	BEB	FCEB	Diesel Hybrid	Diesel
<b>Vehicle Range (per OEM)</b>	150 - 250 miles	350 miles	500 miles	450 Miles
<b>Fueling/Charging Time*</b>	~5 - 8 hours	~20 minutes	~20 minutes	~20 minutes
<b>Vehicle Purchase Price</b>	\$850,000 - \$1,000,000 +	\$1,000,000 +	\$700,000 - \$830,000	\$550,000
<b>Infrastructure Cost</b>	\$69,000 per depot charger/bus**	\$4.7 million for 50 buses***	Uses existing infrastructure	Uses existing infrastructure
<b>Operations and Maintenance Cost</b>	lower	higher	moderate	moderate

\*Assuming depot slow-charging of BEB, highly variable based on charger power and battery size

\*\*Does not include other costs associated with addition of chargers, including potential transformer, substation, and conduit upgrades

\*\*\*Based on OCTA's 18,000-gallon liquid storage Hydrogen station, built in 2019






## Key Considerations for ZEB Policy Goals

- Environmental Impact
- Economic Impact
- Operational Impact
- Fleet replacement and purchasing plan
- Infrastructure Needs
- Stakeholder Engagement
- Workforce Training
- Regulatory Framework



## Peer Agency Interviews

The peer transit agencies identified have similar fleet sizes, climates, and operational challenges. Interviews with each agency focused on sharing experiences, obstacles, and solutions developed through the course of implementing low- and no-emission technologies. These conversations helped to develop an understanding of considerations Connect should make while studying the potential to transition to low- or no-emission vehicles.

					
Number of Transit Buses	29	30	118	32	30
Current Percent of ZEB	0%	43%	11%	25%	6%
Technology	N/A	BEB	FCEB	BEB	BEB

## Key Takeaways & Challenges

### Takeways

BEBs have limited ranges that would likely require operational changes.



A ZEB Transition is expensive - vehicles are roughly double the price of diesel buses.



FCEBs have longer ranges, but the infrastructure cost is likely prohibitive at Connect's fleet size.



### Challenges

There are high initial capital costs to update or upgrade facilities to accommodate ZEBs, varying from agency to agency.



Agencies have had difficulties finding skilled labor to maintain the chargers.



BEBs have constrained ranges, often requiring fleet expansions, or route and service adjustments.



There are additional safety considerations with an FCEB deployment, especially regarding fuel production, delivery, and storage.

