ZERO-EMISSION BUS ROLLOUT PLAN UPDATE

Innovative Clean Transit Regulation

- Adopted in October 2019
- ZEBs have no tailpipe emissions
- Minimum ZEB purchase requirement starting in 2023:
  - *25 percent requirement starting in 2023 for 40-foot buses*
  - *50 percent requirement starting in 2026 for 40-foot, 60-foot and cutaway buses (paratransit buses)*
  - *100 percent requirement starting in 2029*
- Submit ZEB Rollout Plan to CARB by July 1, 2020
- Credits for zero-emission mobility option
- Delay in ZEB purchase requirement if a certain number of ZEBs are purchased statewide by the end of 2020 and 2021

CARB – California Air Resources Board
ZEB – Zero-emission bus

OCTA ZEB Pilots

- **Hydrogen Fuel-Cell Electric Buses**
  - Commissioned hydrogen fueling station
  - Ten buses now in service
  - Funded with state grant
  - Credits for reduced future purchase requirements
- **Battery Electric Buses**
  - Procuring ten battery electric buses starting in 2020
  - Conducting assessment of power and charging equipment requirements at the Garden Grove Bus Base
  - Working with electric utility to assess electric charger locations and necessary upgrades
  - Pursuing grant funding for vehicles and infrastructure

40-foot Hydrogen Fuel-Cell Electric Bus

Hydrogen Fueling Station

OCTA – Orange County Transportation Authority

Existing OCTA Fleet

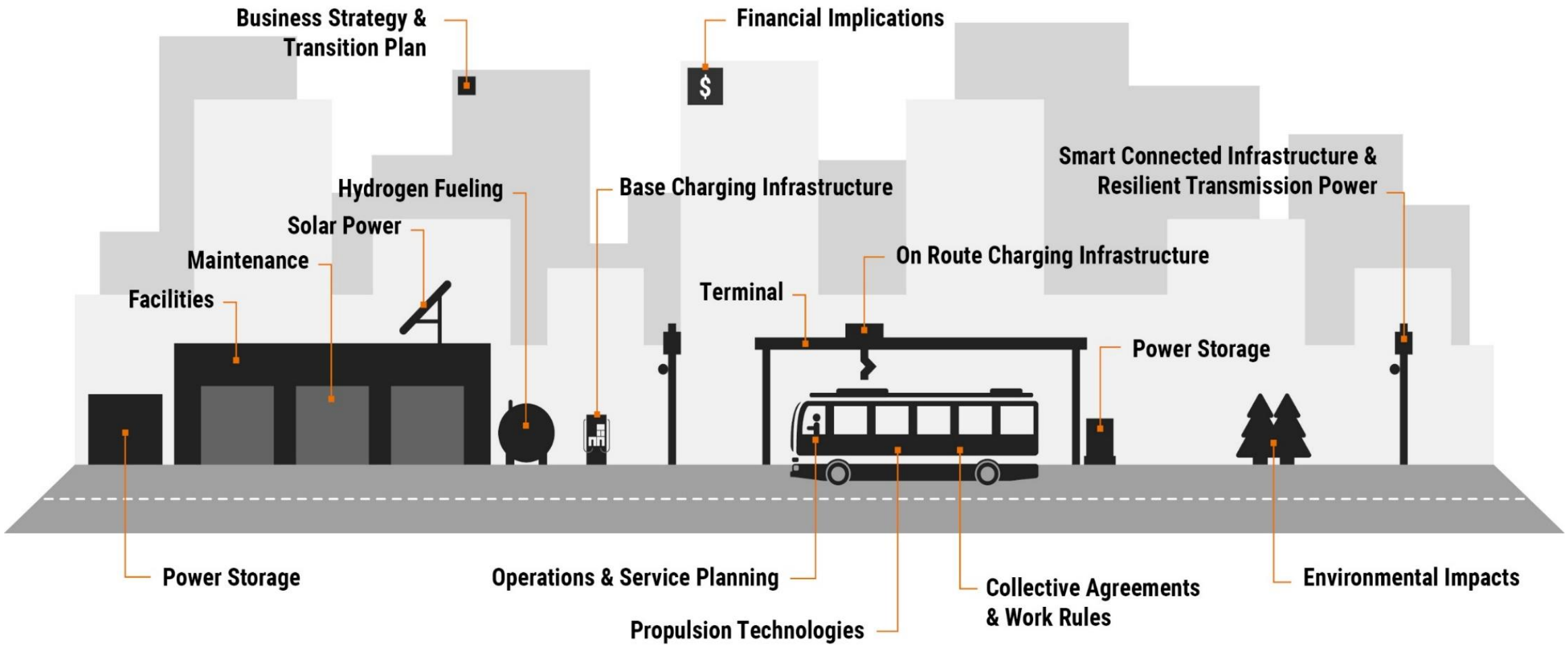
	Bus Type	Fuel Type	Fleet Size	Year Subject to ICT
	40-foot Fixed-Route	CNG	462	2023
	40-foot Fixed-Route	Hydrogen	10	Early ZEB Purchase
	60-foot Fixed-Route	CNG	36	2026
	32-foot Fixed-Route	CNG	12	2026
	23-foot Paratransit	Gasoline	248	2026

CNG – Compressed Natural Gas
ICT – Innovative Clean Transit

What is a ZEB Rollout Plan?

- Type(s) of ZEB technologies a transit agency is planning to deploy
- Schedule for all ZEB and conventional bus purchases
- Schedule for infrastructure upgrades and modifications
- Identification of costs and potential funding sources
- Training plan for operators and maintenance staff
- Plan to deploy ZEBs in disadvantaged communities
- Goal of full transition to ZEBs by 2040
- Plan can be amended

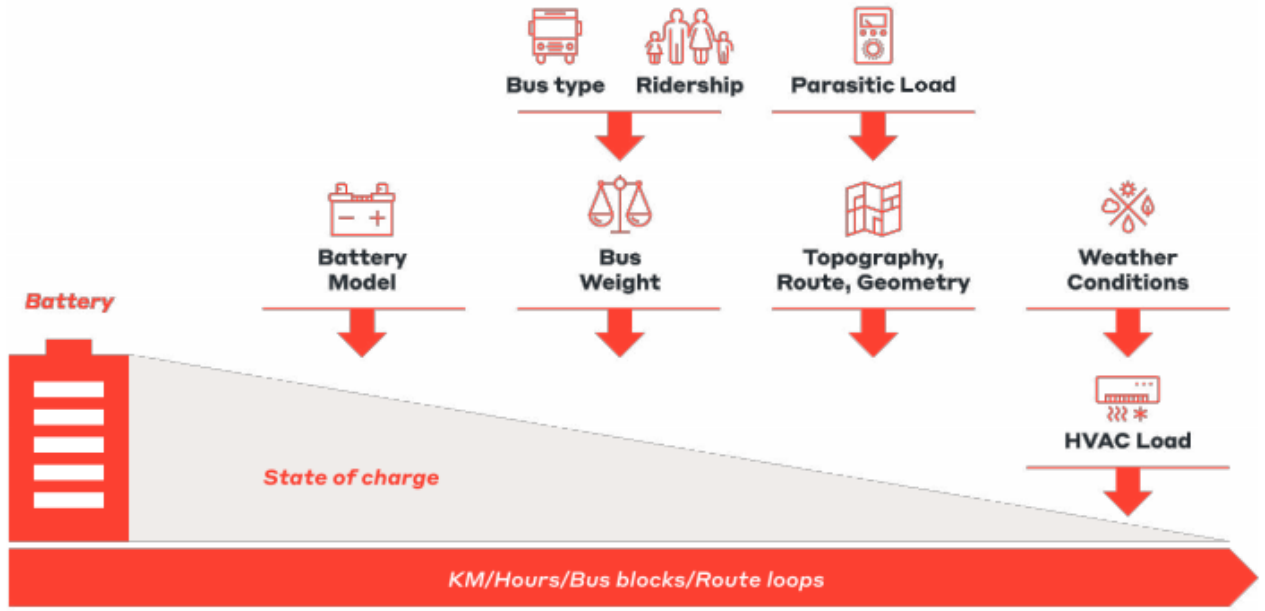
Elements of ZEB Deployment



Consultant Assistance

- **Assess Vehicle and Fueling Technology**
  - Evaluate ZEB technologies
  - Route modeling
  - Zero-emission mobility options
  - Fueling infrastructure

- **ZEB Rollout Plan**
  - Implementation Phasing Plan
  - Financial investment required
  - Final report preparation



Vehicle Fueling Technology Comparison

Bus Type	CNG	Hydrogen Fuel-Cell Electric	Battery Electric
Vehicle Range	Longest	Middle	Shortest
Vehicle Cost	$580,000	$1,000,000 to $1,200,000	$750,000 to $1,000,000
Fuel Cost	Lowest	Highest	Middle
Maintenance Cost	Highest	Middle	Lowest
Infrastructure Required	Existing Fueling Stations	New Hydrogen Fueling Stations and Facility Upgrades	Extensive Charging Infrastructure and Utility Upgrades

Next Steps

- Identify technology path
- Develop draft ZEB Rollout Plan
- Upcoming procurements of CNG and battery electric buses
- Return to Transit Committee and Board for approval of Rollout Plan in May 2020
- Submit Rollout Plan to CARB by July 1, 2020

Board – Board of Directors