



Zero Emission Transition

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Administrative Services Director



April 4, 2023

Why are we here today?

- ▶ In 2018 CARB adopted the Innovative Clean Transit (ICT) regulation, which set the goal to have all transit buses 100% zero emission by 2040.
- ▶ City staff and other small operators asked RCTC for assistance and in June 2021, RCTC secured a grant of \$271,380 from Caltrans to conduct ZEB Rollout and Implementation Plans for the small bus operators.
- ▶ In April 2022, RCTC awarded a contract to CTE to conduct the necessary steps to complete the required bus rollout plans.
- ▶ The CARB Regulation requires small transit agencies to submit a board approved ZEB (Zero-emission Bus) Rollout Plan by July 1st, 2023.

The Ask: That City Council receives the information for the discussion and selection of a zero-emission bus fuel technology.

Zero-Emission Transition Financial Analysis: Beaumont Transit

Niki Rinaldi El-Abd, Managing Consultant
April 4, 2023

Riverside County ZEB Rollout &
Implementation Plans Project
Funded by Riverside County Transportation Commission



Project Overview

- Existing Conditions Report – Completed November 2022
- Financial Analysis – Completed February 2023
- **Existing Conditions & Financial Analysis Review, Fuel (Today's Discussion)**
- Submit ZEB Rollout Plan to CARB – Before July 1st, 2023
- Zero-Emission Implementation Plan – Targeted Completion October 2023

CARB ICT Regulation

- Legislation adopted in 2018
- Goal: 100% ZEB Fleet by 2040
- Mandates to reach the goal:
 - Small CA Transit Agencies (buses) must submit a board-approved ZEB Rollout Plan by July 1, 2023
 - Purchasing Mandate

Three Beaumont buses will be due for replacement in 2028 (1 *must be zero-emission to comply with the purchasing mandate*)

Purchasing Mandate:

Starting January 1	ZEB Percentage of Total New Bus Purchases
2026	25%
2027	25%
2028	25%
2029	100%

CARB ICT Rollout Plan Requirements

ZEB Rollout Plans must include:

- A goal of a complete fleet transition to zero-emission buses by 2040
- Avoiding early retirement of conventional ICE buses
- Identification of the types of zero-emission bus technologies
- A purchasing schedule
- Location details for ZEB facilities and a schedule of infrastructure operations
- A Disadvantaged Communities Service Plan
- A Training plan and schedule for ZEB operators, maintenance, and repair staff
- Identification of potential funding sources

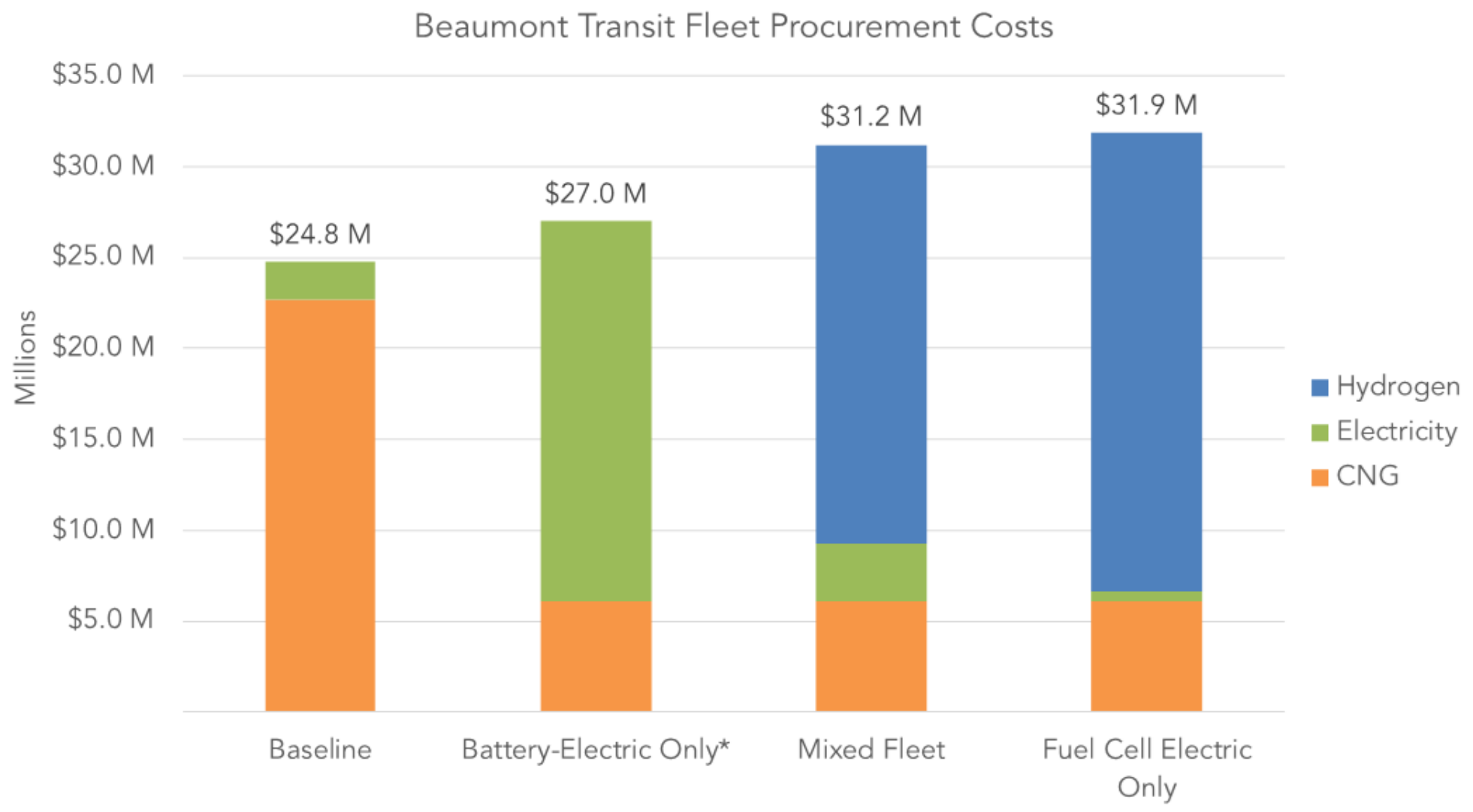
Financial Analysis Overview

Financial impacts of ZEB technology transition for the City of Beaumont Transit Service include:

- Fleet Capital Cost
- Fuel Costs
- Maintenance Costs
- Preliminary Infrastructure Projects & Costs
- Total Cost of Ownership
- Benefits and Drawbacks of Each Technology

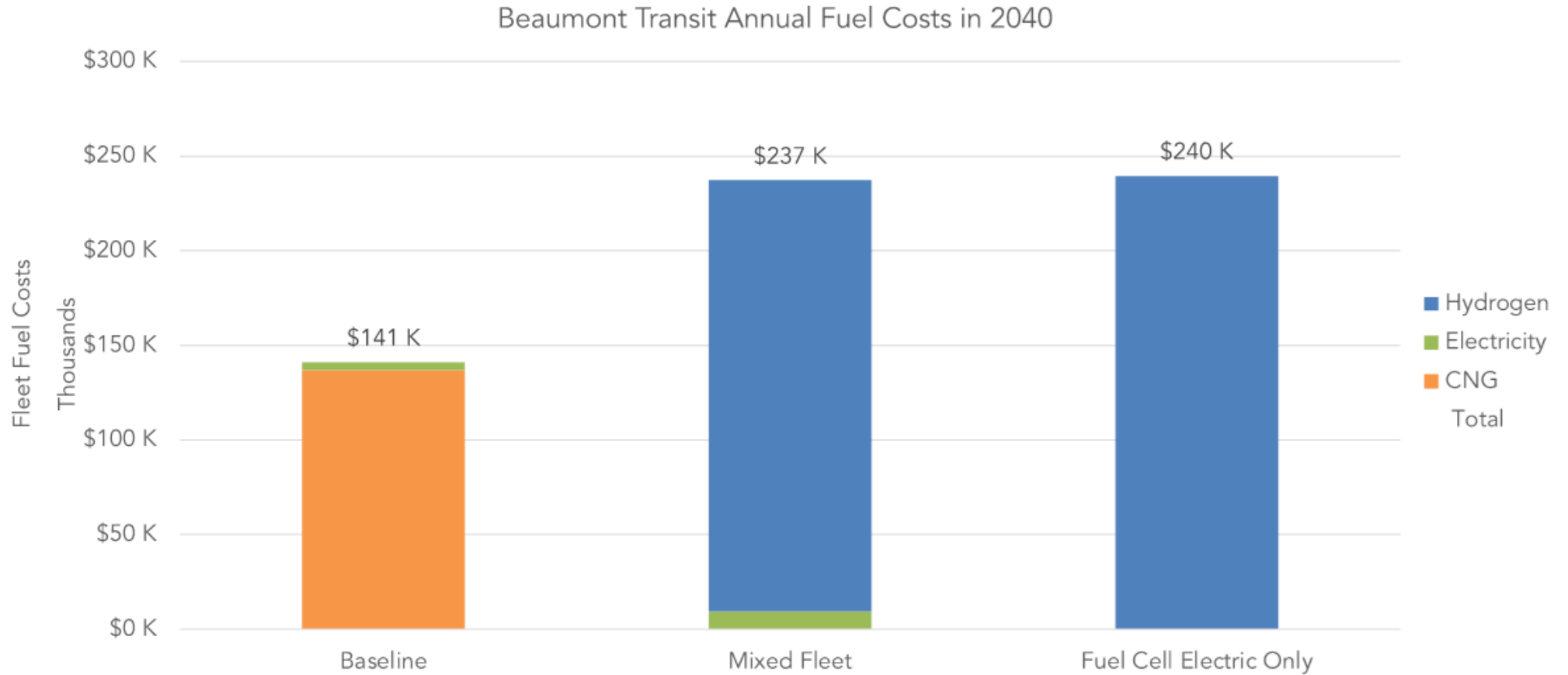
Comparative Fleet Capital Costs

Entire Transition Period, All Scenarios



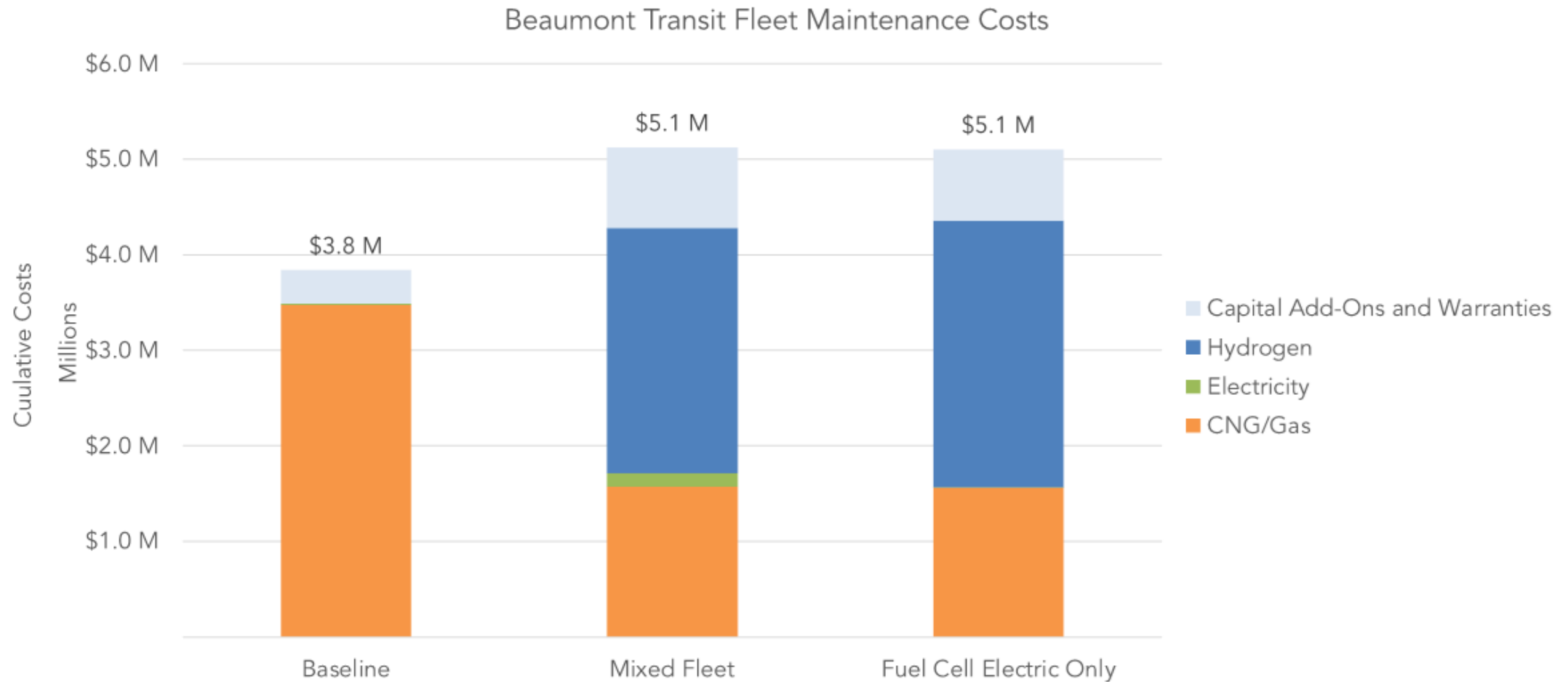
Comparative Annual Fuel Costs

Estimated Fuel Costs in 2040, All Scenarios – Single Year of Operations



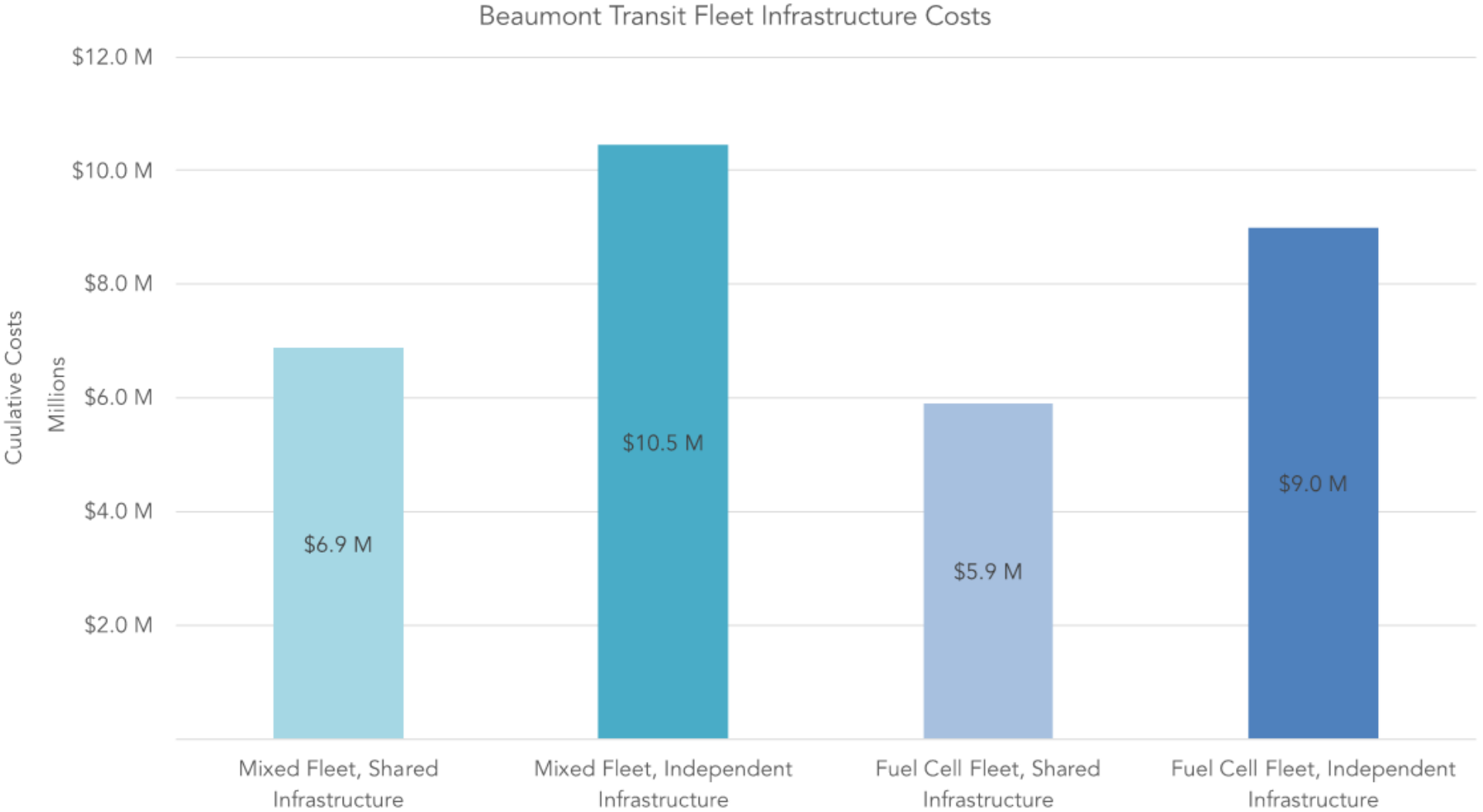
Comparative Maintenance Costs

Entire Transition Period, All Scenarios



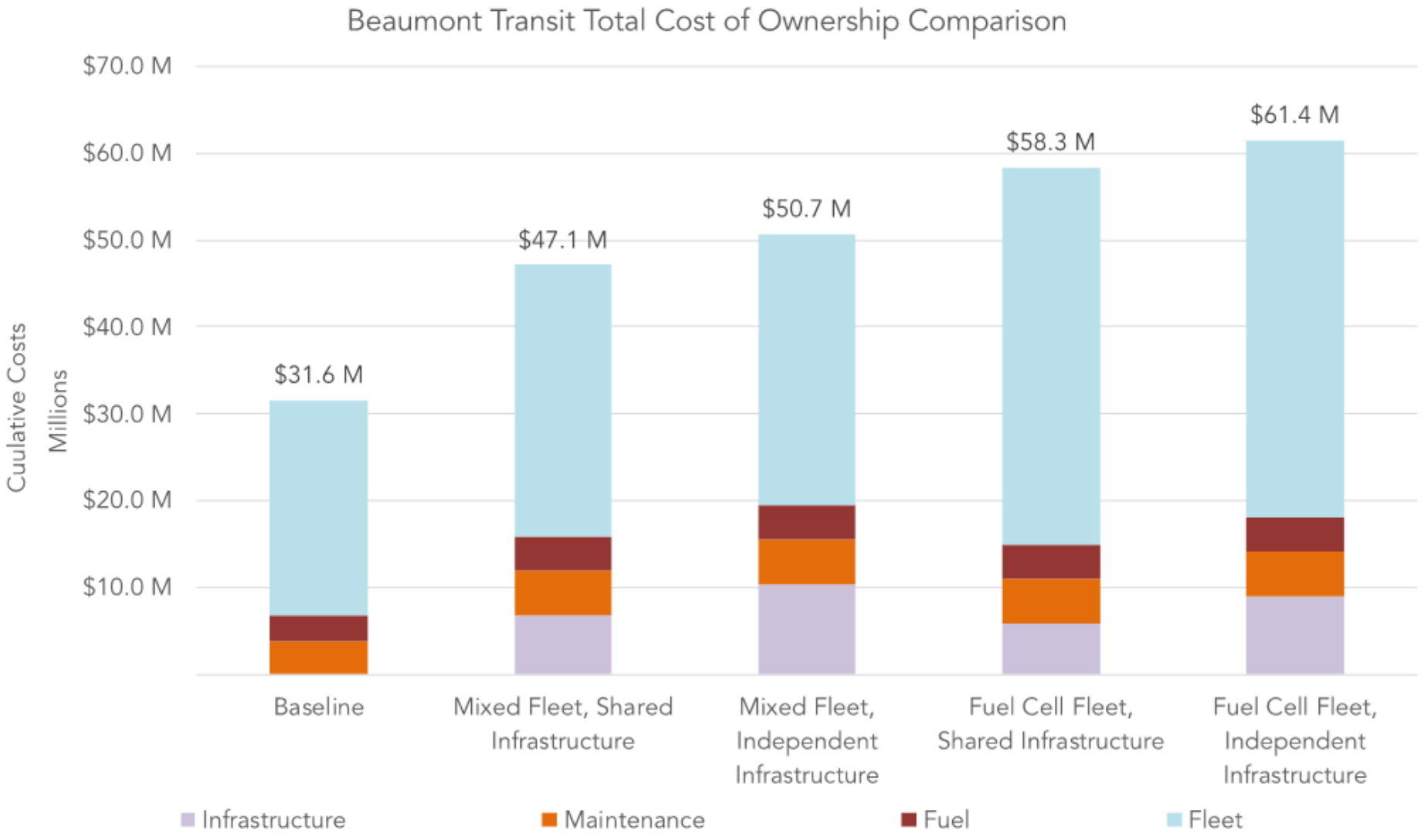
Comparative Infrastructure Costs

Entire Transition Period, All Scenarios



Comparative Total Cost of Ownership

Entire Transition Period, All Scenarios – Cumulative Costs



Considerations for Selecting ZE Propulsion Technology

BEB Fleet

- Beaumont's required service energy exceeds the the power onboard market market available vehicles of vehicles of the same type as type as Beaumont's existing existing fleet and do not not allow for on-route charging. Thus, this technology is not sufficient sufficient to perform Beaumont's service and was was not considered a feasible option.

Mixed Fleet

Pros

- Multiple technologies provide greater redundancy and resilience benefits; less reliant on the grid or fuel supply

Cons

- Three to four different fueling infrastructures will be required at depot for three to four propulsion technologies (CNG, gas, hydrogen, electric)

FCEB Fleet

Pros

- Operationally similar to current fleet. No service or schedule changes are required due to the technology
- Anticipated fuel price reduction due to regional renewable H₂ supply developments

Cons

- Delivery of hydrogen occurs through diesel trucking in cost analysis

Other Considerations

Transition plans are living documents that are meant to be revisited as the market matures.

- These analyses are based on the Existing Conditions Report published in November 2022
- There are operational costs and impacts that may increase the need for personnel such as ZE project managers, operations staff, trainings, grants managers, which are not included in this analysis.
- Scheduling changes are not included in this assessment. Operators can review operational modifications that may simplify their transitions to ZEV.
- Prices used in the analysis are a snapshot of today's market, while they are evidence-based predictions, the hydrogen market is nascent and will likely see large pricing drops with increased supply and commercialization.
- While shared infrastructure offers cost savings, there is potential for increased deadhead with shared infrastructure.
- EV Rate Schedules do have end dates projected, so electricity prices are likely to rise.
- Selecting a single technology can increase operational simplicity and cost savings.
- Selecting multiple technologies does make a fleet more resilient to grid-down or fuel supply shortage scenarios.

What Are Local Partners Doing?



Riverside Transit Agency - Fuel Cell Electric per submitted ICT Rollout



SunLine Transit Agency - Fuel Cell Electric per submitted ICT Rollout



OmniTrans - Battery Electric per submitted ICT Rollout



OmniTrans is now implementing a mixed fleet solution including **Fuel Cell Electric Buses**



City of Corona - Recommending a mixed fleet solution to City Council.



Cities of **Banning**, **Beaumont**, and **Riverside**, and **PVVTA** are in the process of reviewing options for ICT Rollouts developed in concurrence with the **City of Beaumont**.

Next Steps for Zero-Emission Transition

Staff Recommendation - Mixed Fleet Bus Fuel Technology (Tonight's Meeting 4/4/2023)

Receive City Council Approval of Final ICT Rollout Plan for submission to CARB (June 6th, 2023)

RCTC staff to compile ZEB rollouts for all operators to develop a countywide Financial Strategy for future funding and implementation - July to October 2023

Incorporate necessary changes into the proceeding Short Range Transit Plans

Questions ?