California Transit Association
53rd Annual Fall Conference

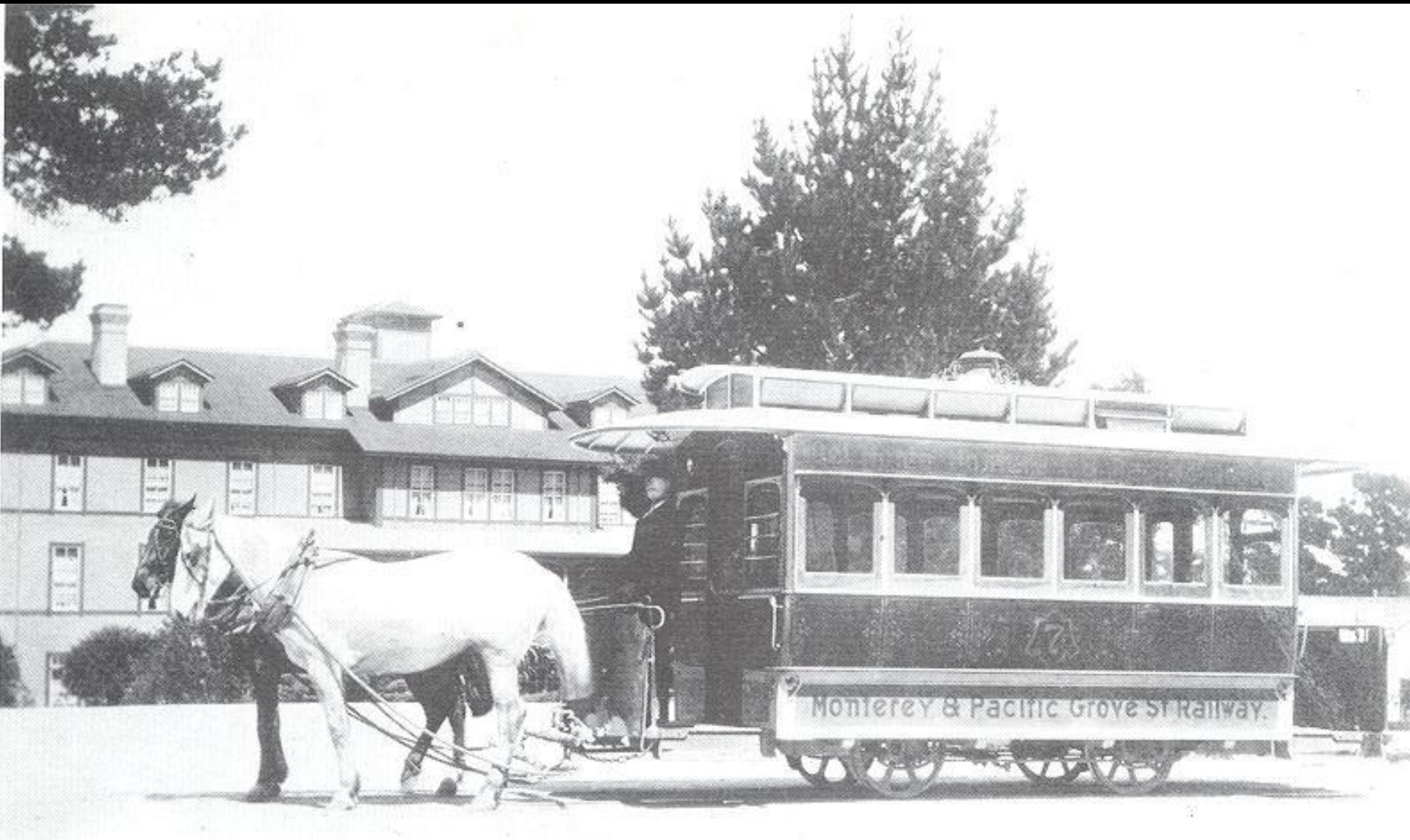
The Times They Are A-Changin':
Lessons Learned from Early ZEB Adopters

Monterey-Salinas Transit

Carl Sedoryk, CEO

MST Service Area

Initial Monterey ZEB Deployment (April 1891)



Monterey Transit Propulson History

1891 – 1901 – Horse drawn Streetcars

1901 – 1921 – Electric Trolley (Crude-Oil Generator)

1922 – Present – Diesel / Gasoline

- 1980's – Lead-Acid Battery
- 1990's – Compressed Natural Gas
- 2000's – Locally Grown/Processed Bio Diesel
- 2010's – Diesel Hybrid / Battery-Electric Bus

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MST Fleet Facts – 161 Buses

84	Heavy-Duty Diesel
70	Cut-away Minibus (Gasoline)
4	Hybrid Diesel-Electric
3	Battery Electric Bus (1 Inductive – 2 Plug In)

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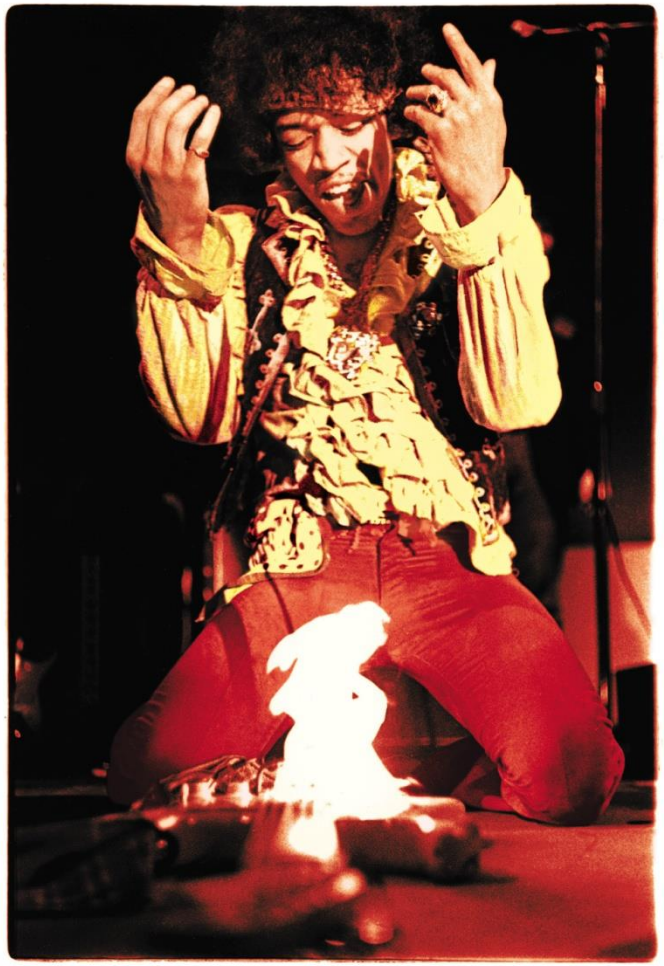
Monterey Electric Experience



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MST Inductive Powered Trolley

Electric Bus Costs

$425,000	Electric Trolley conversion
$ 660,000	Wireless Power Transfer
$454,000	Road and Power Infrastructure

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2 BYD 30’ Plug-In Buses - 2018

Electric Bus Costs

$1,344,000	2 – BYD 30’ Buses
$ (220,000)	2 HVIP Vouchers ($110k each)
$ 750,000	Monterey Infrastructure • 3,000amp transformer (3x power) • 10 total charging stations – 3 active
$ 350,000	Salinas Infrastructure •7 total charging station – 2 active

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MST Electric Bus Issues

Capital outlay for buses and infrastructure

Reliability of buses (Charging not a problem)

Operating Cost of electricity

Obsolescence of technology

Lack of interoperability of charging infrastructure.

Vehicle Range

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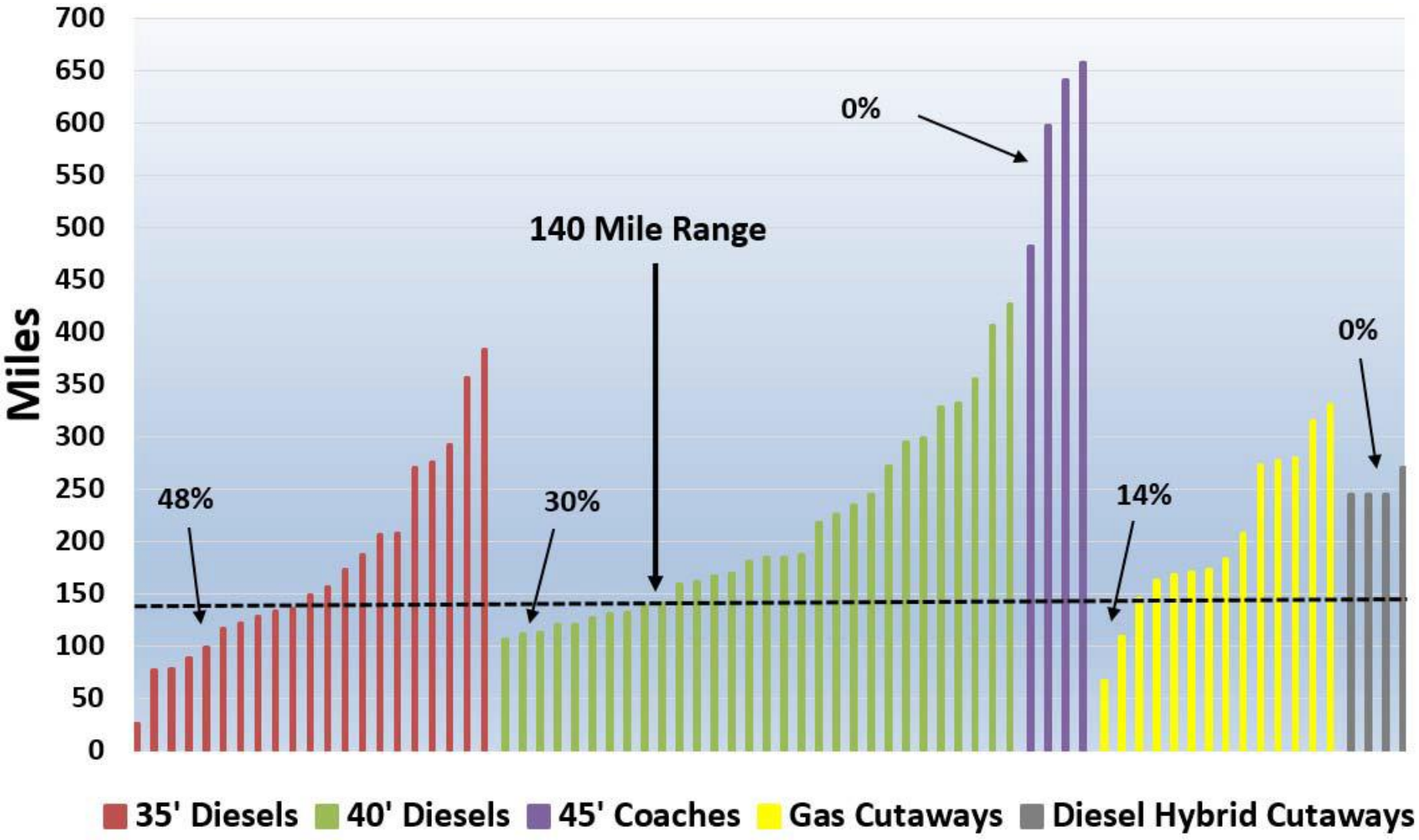
MST Daily Bus Duty Cycles



Innovative Clean Transit Rule

Innovative Clean Transit Rule

Transit agencies would be required to develop individual Rollout Plans to transition to a ZEB fleet by 2040.

Transit agencies would be required to acquire a minimum number of ZEBs at the time of new bus purchases, based on the required percentage of the total new bus purchases.

ZEB purchase requirements for calendar years 2023 and 2024 would be waived, if transit agencies collectively are purchasing a minimum number of ZEBs.

An option to implement zero-emission mobility programs in lieu of ZEB purchases as well as other flexibility options.

Requirement to purchase low-NOx engines if available for conventional internal combustion engine bus purchases.

Requirement to purchase renewable fuels when diesel or natural gas contracts are renewed.

All transit agencies would be required to report their fleet information annually starting from 2021.

Innovative Clean Transit Issues

Continued Access to Incentives

Performance Benchmarking and Off-ramps

Vehicle Applicability

Definitions of Large and Small Operator

Appropriateness of ZEB in Emergency Response

Innovative Clean Transit Rule

Provision	Expected Grade
Benchmarking & Regulatory Assessment	**C+**
ZEB Purchase Requirement	**A**
Waiver for Early Compliance	A-/A
Large vs. Small Agencies	**A**
Role of Incentives	**C**
Purchase Definition	A
ZEB Roll-Out Plan	A
ZEB Bonus Credit	**B/B+**
Excluded Buses	**A**
Deferral from ZEB Purchase Requirement	A
Optional Joint ZEB Groups	+?

Innovative Clean Transit Rule

Next Steps

ARB Staff Directed to work out differences with transit

ARB Board to finalize rule January 2019

More to follow

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