



Lassen Transit Service Agency Zero-Emission Bus Rollout Plan



Lassen Transportation Commission Update
November 13th, 2023



Presentation Overview



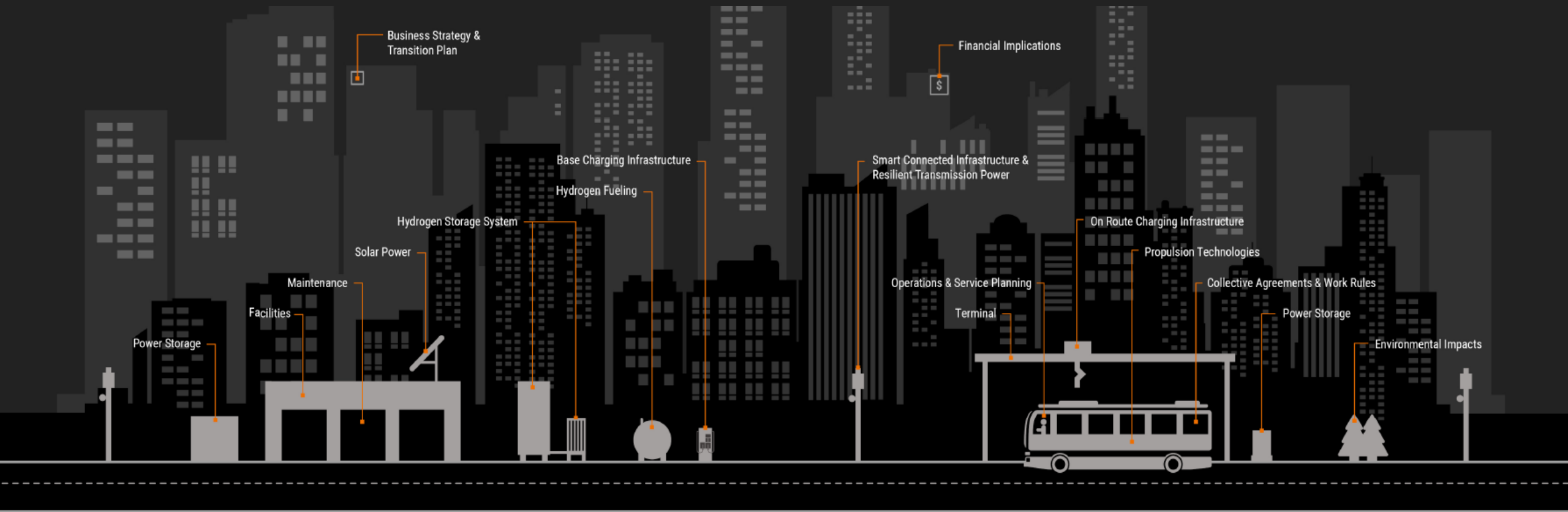
1. Project Purpose
2. Project Phases
3. Key findings from existing conditions
4. Lassen Constraints
5. Next Steps



Project Purpose & Recap



An Incredibly Complex Transition





Project Purpose

- 1. To develop a CARB-compliant zero-emission rollout plan in response to the ICT Regulation
- 2. To develop a transition plan and strategy for the agency's goal of 100% ZE fleet by 2040



Section Description	
Section A	Transit agency information
Section B	Rollout plan general information
Section C	Technology portfolio
Section D	Current bus fleet composition and future bus purchases
Section E	Facilities and infrastructure modifications
Section F	Providing service in disadvantaged communities
Section G	Workforce training
Section H	Potential funding sources
Section I	Start-up and scale-up challenges



ICT Mandate

CARB:

1. Requires that small transit agencies begin **purchasing ZEBs in 2026, with 100% transition by 2040**
2. Requires that small transit agencies submit a **Board-approved plan by July 1, 2023.** LTC has an exception until January 2023
3. Exempts cutaways, motorcoaches and articulated if no Altoona tested vehicles are available
4. Provides exemptions for agencies based on **lack of feasible** vehicle alternatives, challenging terrain, operating profiles that aren't feasible with ZE alternatives, and other challenges.



ZEB Transition Planning

ZEVDecide

Modeling

ZEVDecide

Preferred Fleet Concept

ZEVDecide

Concept Design

Phasing Plan

ZEVDecide

Cost Analysis

Operational Assessment

ZEB conversion recommendations +
procurement and funding opportunities

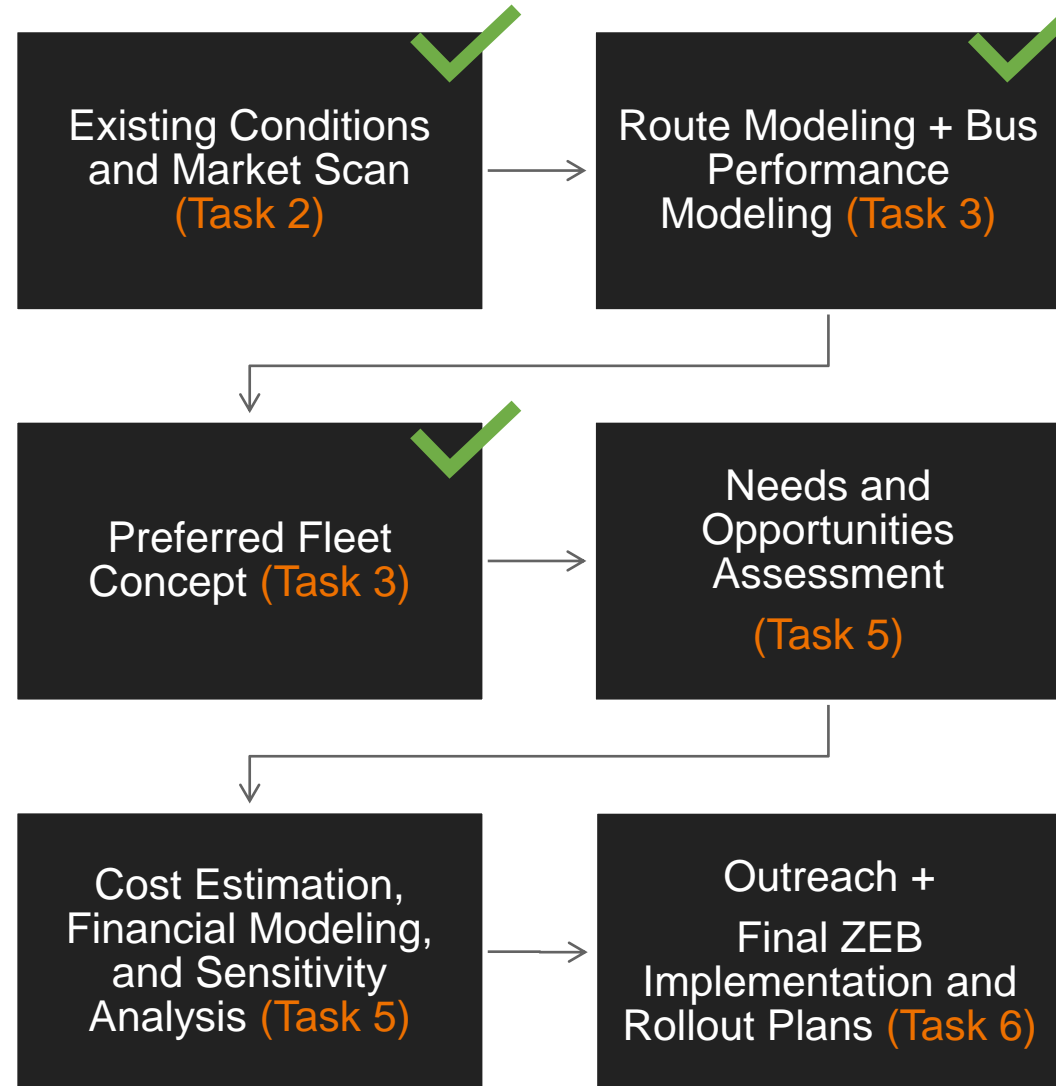
**ZEB
Implementation
Plan**



Project Purpose and Phases



Proposed Approach & Assumptions





Existing Conditions – Key Findings



Current Fleet



- Mix of **fixed route, deviated fixed route, and demand response services**
- Mix of **40-ft buses, freightliners, cutaways, and vans**
- Diesel and gasoline
- Total of **13 vehicles**

Quantity	Agency ID	Vehicle Year	Vehicle Type	Vehicle Manufacturer	Vehicle Length (ft)	Fuel Type	Vehicle Age (Years)
1	101	2010	Bus	Gillig	40	Diesel	13
1	102	2012	Bus	Gillig	40	Diesel	11
3	19-21	2014	Cutaway	Arboc	26	Gasoline	9
2	22-23	2016	Bus	Freightliner	30	Diesel	7
2	26-25	2019	Cutaway	GMC	26	Gasoline	4
1	24	2020	Bus	Glaval	32	Diesel	3
1	27	2020	Van	Ford	20	Gasoline	3
1	103	2020	Bus	Gillig	40	Diesel	3
1	28	2022	Cutaway	Dodge Chrysler	26	Gasoline	1

Notes: Vehicle ID 101 is to be retired in 2023 and will not be replaced, Vehicle ID 23 is at a repair shop for a long-term repair.



Bus Specifications

BEB Model	40 ft bus	Cutaway	Freightliner (30 ft bus)
Battery (kWh)	525	127	150
Curb Weight (lbs.)	45,000	14,500	29,700
Service type	South County Commuter, South County Route	Susanville City Route, Susanville City Route Express, Dial-A-Ride	West County Route



40 ft



Cutaway



Freightliner (30 ft bus)

FCEB Model	40 ft bus	Cutaway	Freightliner (30 ft bus)
Tank (kg)	37.5	13.5	37.5
Curb Weight (lbs.)	45,000	16,500	30,000
Service type	South County Commuter, South County Route	Susanville City Route, Susanville City Route Express, Dial-A-Ride	West County Route



40 ft



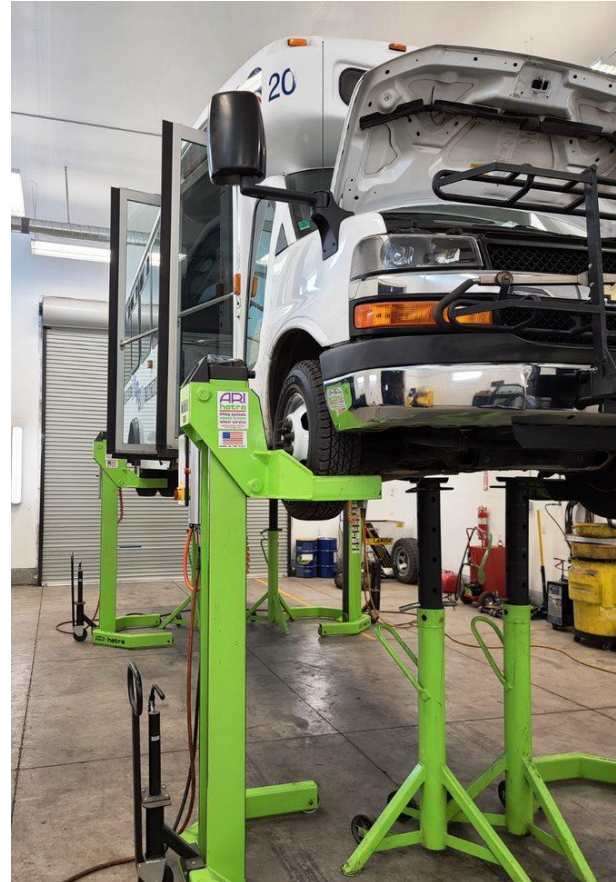
Cutaway



Freightliner (30 ft bus)



Operating Base and Maintenance Facility

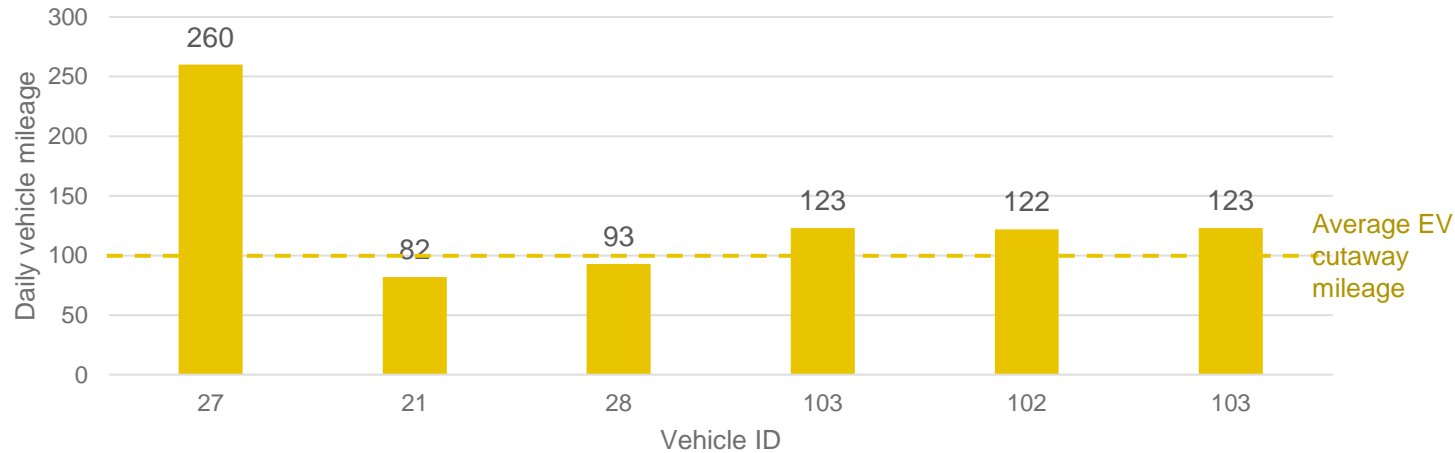


- Located in Susanville
- Houses vehicle washing, fleet parking, employee parking, maintenance, and operations
- Considerations:
 - Upgrade building exhaust systems
 - Gas detection system would be required for hydrogen
 - Significant electrical upgrades would be required for BEBs



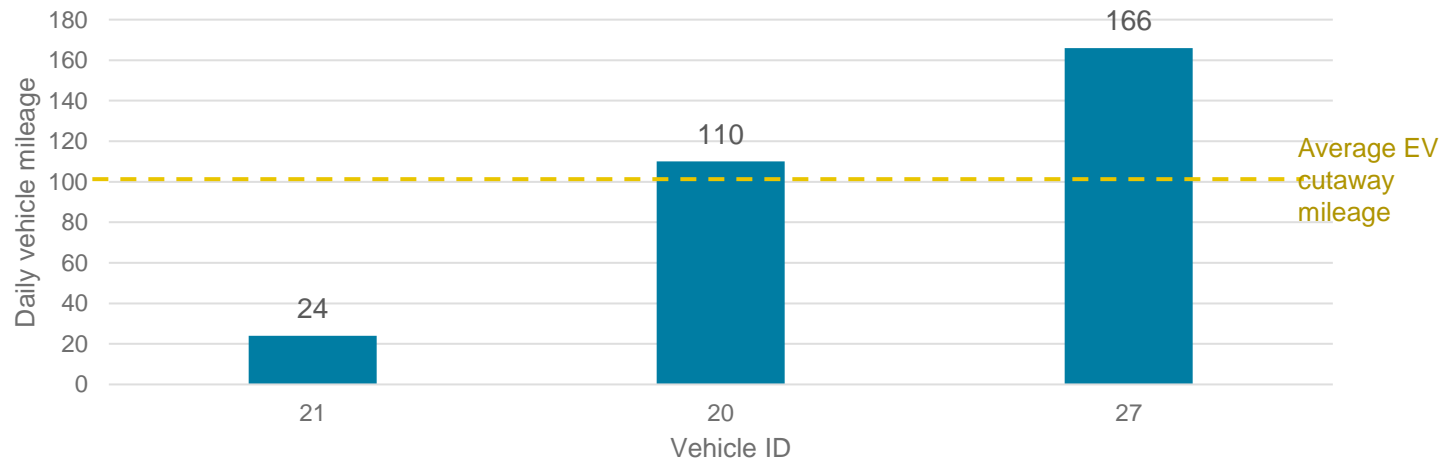
Block and Vehicle Mileage (Fixed Route)

Weekday Vehicle Mileage



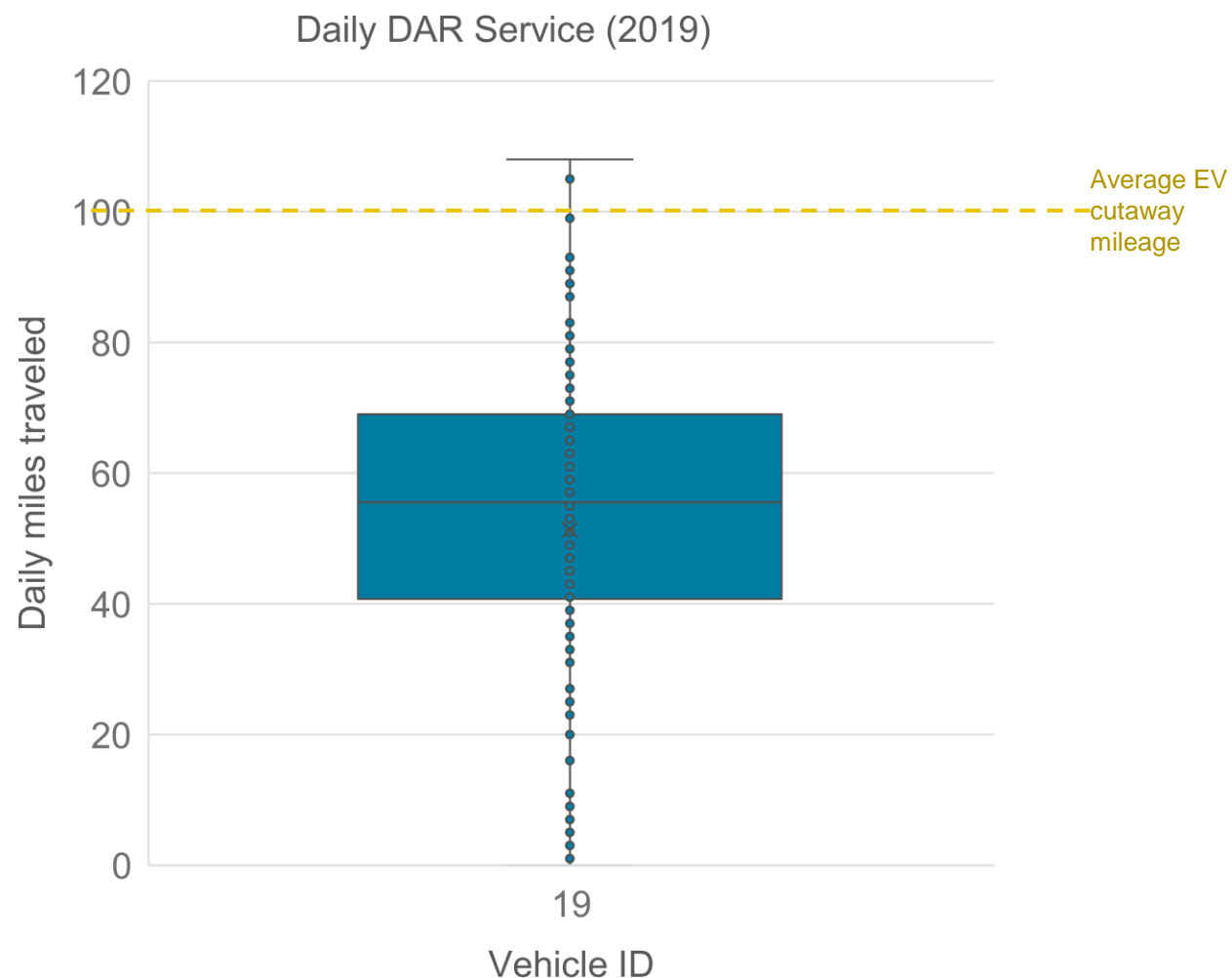
- Most vehicles operate multiple blocks in a day
- Most of vehicles operate above 100 miles which could be challenging for Electric cutaways

Saturday Vehicle Mileage





Demand Response Vehicle Mileage



- Dial-A-Ride paratransit within Susanville city limits
- 302 runs from 2019 were analyzed
- Average distance: 51 miles
- Median distance: 55 miles
- Maximum distance: 108 miles

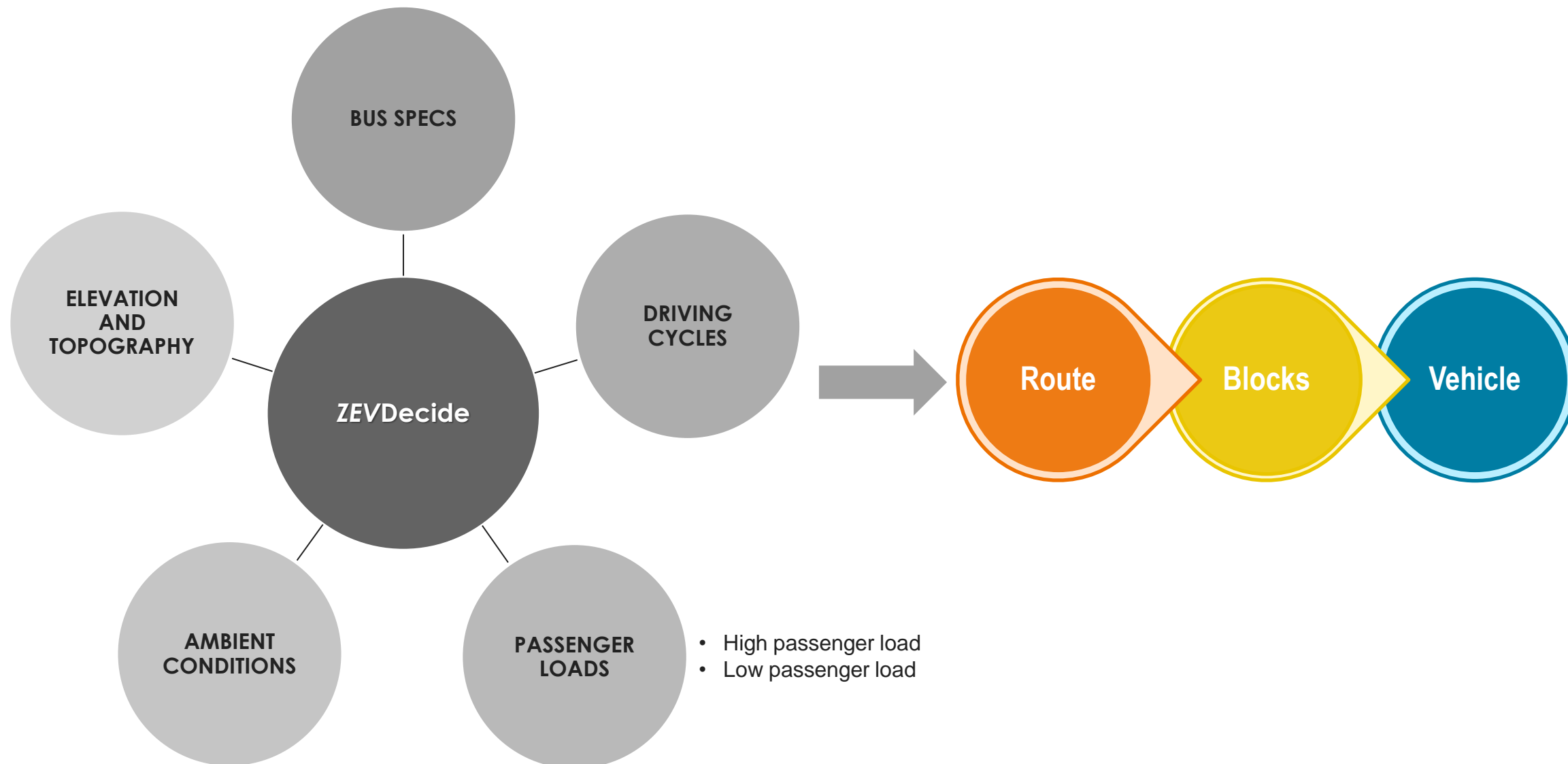


Key Findings and Observations

- LTSA operates a variety of service with a variety of vehicles
- Challenging climate
- Current mileage might be difficult to accommodate with smaller ZEs (cutaways, vans)
- Current facility will require significant upgrades for either technology type



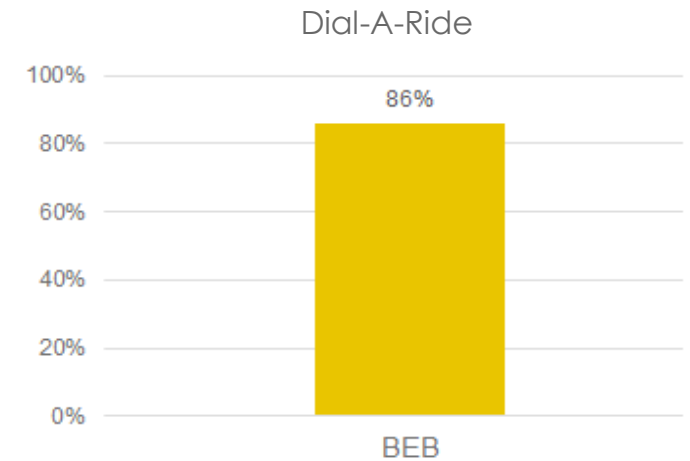
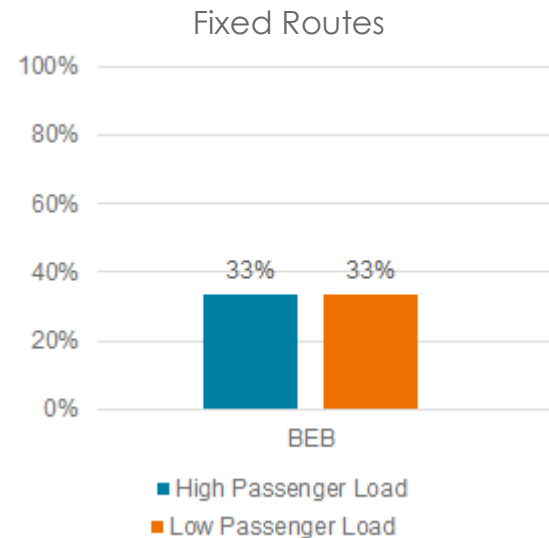
Modeling Process Overview





Modeling Summary

- Only 33% of current service can be served with BEBs without operational modifications
- Commercially available Electric Cutaways don't have enough range for fixed route operations
- No Electric equivalents for Freightliners.
- Dial-A-Ride success rates are high for Electric cutaways.





Lassen Specific Takeaways

Only 33% of current service can be served with BEBs without operational modifications

LTSA vehicles are part of the **county disaster preparedness**

Limited EV options for cutaways and freightliners

Automated snow chain systems are required for operations in winter season



Lassen Specific Takeaways

LTSA has a limited drivers pool – limits electric vehicle swaps

No EV maintenance availability in the region

Full conversion to BEBs with the same level of service will require **increasing** the size of the fleet.

The intent is to start the conversion process **after 2032**, to account for technology improvements that will better fit the operational needs of Lassen.



Next Steps



Next Steps

- Finalize phasing plan
- Determine infrastructure requirements and associated cost
- Financial Plan
- Final deliverable: ICT & ZEB Rollout Plan



Schedule