

King County Metro: Moving to Zero Emission Transportation

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Topics Today

1. Response to Audit and Next steps
2. Zero Emissions Program Update

Response to Audit and Next steps

Audit & Metro Approach to Zero Emissions

- Utility of the Zero Emissions Audit
- Strong Alignment with Specific Recommendations
- Nascent Technology + Go First Agency = Continuous Learning and Adaptation
- Embrace the Risk

Zero Emissions Program Update

Zero Emission Fleet Goal – Strategic Climate Action Plan

2025: 90% increase in utilization of (electric) trolley buses on weekends

2030: 70% reduction in GHG emissions from fleet (below 2017 levels)

2030: 100% electric vehicle (EV) fleet for light-duty, non-revenue vehicles

2035: 100% zero emission revenue bus fleet



All-electric Bus Prototype

Moving to Zero Emission – Key Bus Fleet Milestones



We
are
here

2022-2024

South Base Test Facility
40 BEBs in service
Procuring more battery electric buses
IT and charge management development
BEB Academy +
Planning for conversion efforts



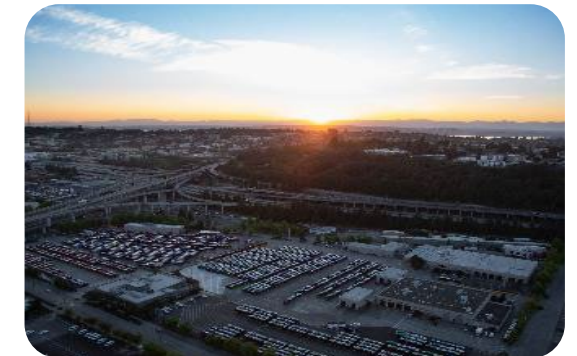
2026

Interim Base opens (120 BEBs)
Planning for future base conversion
Prepare operations: staff and train workforce



2026-2028

Four layover charging projects
Purchase additional trolleys
South Annex Base opens (250 BEBs)
Shutdown Central Base for conversion
Planning for additional chargers



2028 – 2035

Central Base re-opens
Conversion of Metro's remaining 6 existing bus bases
825 BEBs purchased
Additional layover charging around King County

- On-going partnerships with utilities, jurisdictions, transit partners, other agencies
- Workforce training and agency preparation

2023 Year in Review

\$33.5M FTA grant for buses and workforce development

\$4.9M Green Transportation Grant for opportunity chargers

ZE systems map and contextual analysis completed

CHARGING FORWARD

EVALUATING PUBLIC-PRIVATE PARTNERSHIPS FOR ELECTRIC BUS BASE CONVERSION TO SUPPORT A ZERO-EMISSION FLEET



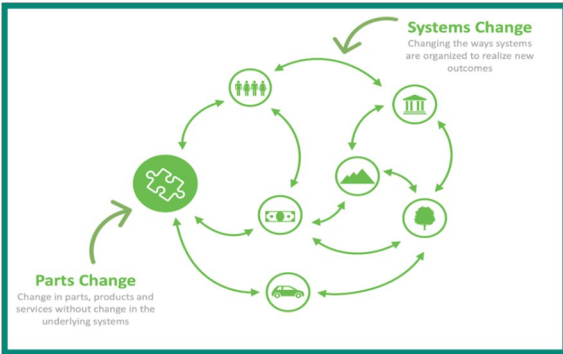
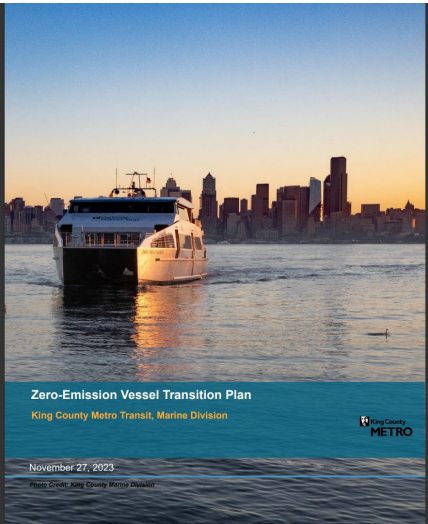
Completed reports/studies:

- Marine – Zero Emissions Transition Plan
- West Seattle Mobility Hub/Passenger Ferry Terminal Site Selection Study
- SCAP Biennial Report Update
- Public Private Partnership study in partnership with UW
- Transit System Electrification Planning (TSEP) Phase I initial report
- South Base Test Facility Winter Weather Pilot

Risks and Values Workshop series completed

WA State Clean Fuels Standards

KCM and KCIT received CIO 100 Award



2024 Achievements to Date

1 millionth battery electric bus mile

40th long range battery electric bus in service

Software procured:

- Charge Management Software (INIT)
- Scheduling Software (INIT)
- Yard Management Software (Giro/HASTUS)

Broke ground at Interim Base (pic below)

EV transition: 68 to date

South Annex Base nearing 90% design (pic top right)



Zero Emissions audit complete

Hydrogen fuel cell bus pilot planning

Battery electric bus procurement (GILLIG) awarded

Dept of Commerce EV charger grant award recieved

4 Opportunity charging locations under design

EV chargers installed at training site, Central Base, and 6th Avenue Garage

State of the Industry

- Dwindling number of U.S. zero-emission bus OEMs
- Lack of standards and interoperability between charger, bus, and battery manufacturers
- Evolving technologies
 - Battery technology including BEB range limitations
 - Charge management, dispatch, and yard management
- Utilities and grid preparedness
- Managing complexity and scale of fleet electrification: there is no industry standard to phase implementation

Hydrogen Fuel Cell Bus Pilot – 3rd Omnibus request



Purpose and Understanding

- Will HFCBs be able to operate **long hours** and distances?
- Will we be able to procure affordable **green hydrogen**?
- How do we **maintain** hydrogen fueling infrastructure?
- How does the **operational costs** of HFCBs compare to battery electric buses?
- How do we **train our workforce** to safely operate and maintain HFCBs?
- How to build HFCB **public awareness** and acceptance?

Pilot Recommendations



Retrofit an existing facility



Mobile fueling station



Two 40' and two 60' buses



Evaluate buses all seasons