Electric School Bus Network Forum

Fleet Maintenance Operations and Escalation

October 7, 2026

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Icebreaker:
Candy corn, yay or nay?

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October 7, 2026

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CALSTART is now Catalyst Mobility™

Who is Catalyst Mobility?

- Catalyst Mobility is a global nonprofit that brings together industry, government, and communities to advance and accelerate affordable clean transportation solutions accessible to all. Our work is critical to delivering cleaner air, curbing climate change, and creating economic opportunity.
- **We are rebranding to best represent the scope and impact of our work now and in the future while honoring and respecting the heritage of collaboration and innovation that got us to this inflection point.**

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Catalyst Mobility™, formerly CALSTART

Strategic combination with Forth

- Both CALSTART and Forth share a vision of a future transportation system that is clean, equitable, affordable, and supports the movement of all people and goods.
- **Together, we can be stronger, more resilient, and more impactful.**

Our emails have changed!

- We are now @catalystmobility.org
  - Ex: SchoolBusTeam@calstart.org is now SchoolBusTeam@catalystmobility.org

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The Electric School Bus Network accelerates nationwide school bus fleet electrification through **peer-to-peer networking** and **dialogue-driven forum meetings** for school districts, advocacy organizations, government organizations, and industry representatives. The ESB Network provides access to educational tools, resources, and subject matter experts to help **support the electric school bus fleet transition**.

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MEET THE ESB TEAM

Mike Hynes
Deputy Director

Ian Fried
Lead Program Manager

Sarah Stalcup-Jones
Lead Project Manager

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Project Manager

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Background: What components are different between ICE and EV School Buses?

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Comparison of electric and internal combustion engine vehicle components by WRI

- **ESBs utilize motors composed of only around 20 parts, compared with 2,000 in a diesel engine. As a result, the vehicles:**
  - Require fewer fluid changes and don't use engine oil
  - Some EV models eliminate the need for a transmission
  - Overall have fewer parts to maintain than their diesel counterparts
- WRI broke down some of these similar and differing components in their 2024 Issue: Electric school bus US market study: A resource for school districts and other school bus operators for pursuing fleet electrification

Components Common for EV and ICE Buses

Body System	Body
	Doors
	Windows
	Head/ all lights
Suspension	Springs
	Shocks
	Air leveling
	Front axel
	Control arms
Brake System	Brake calipers
	Air compressor
	Reservoir
	Break pedal
Driveline System	Wheels
	Tires

Steering System	Steering wheel
	Gearbox
	Power steering pump
	Steering arm
	Tie rod
	Hydraulic system
Climate Control System	HVAC compressor
	Blower
	Ducts
	Vents
	Heat pump
	Burner/heater
	Controls

Gauge & Warning System	Instrument cluster
	System monitor system
	Display/ HMI
	Alert buzzer
Communications System	Transponder
	PA system
	Tracking
Lighting System	Control panel
	Lights (overhead)
Interior System	Seats
	Flooring
	Luggage storage
Public Interface	Display signage
	Advertising

Source: WRI's Electric school bus US market study: A resource for school districts and other school bus operators for pursuing fleet electrification

Components Changed for EV Buses

Chassis System	Frame
	Body mounts
	Engine mounts
	Suspension mounts
Driveline System	Shifter
	Rear axel(s)
	Differentials

Electrical/ Power Supply System	Battery
	Generator/ alternator
	Inverter
	Wiring
	Voltage/ current monitors
	Distribution module
	Outlets/ connections

Source: WRI's Electric school bus US market study: A resource for school districts and other school bus operators for pursuing fleet electrification

Components Only in:

ICE Buses

Engine System	Engine
	Radiator
	Turbocharger
	Oil Filter
	Coolant Hoses
Exhaust System	SCR catalyst
	DEF tank
	DPF canister
	Muffler
	Exhaust pipes
	Exhaust brake

Fuel System	Tank
	Pump
	Hoses
	Filter
	Separator
	Injector

EV Buses

Power Unit	Motors
	Drive reduction
	E-axel
	Battery
	Inverter
	Charger

Source: WRI's Electric school bus US market study: A resource for school districts and other school bus operators for pursuing fleet electrification

ESB Maintenance Responsibility Playbook

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ESB Maintenance Responsibility Playbook

Electric school buses (ESBs) require less routine maintenance than internal combustion engine (ICE) school buses because they have fewer mechanical components and systems that require regular servicing. However, the maintenance that remains can look different from what your school district is used to with ICE buses. This resource provides you with a roadmap for understanding those differences and growing your ESB maintenance capabilities over time.

Your school district can use this resource to assess where your maintenance operations stand, identify tasks you should be handling, and plan for additional responsibilities as your ESB fleet and experience grows. Maintenance tasks vary by vehicle, district capacity, dealer or original equipment manufacturer (OEM) agreements, and staff training, therefore, use this resource as a guide, not as a prescriptive list of required responsibilities. This playbook is intended for use by school districts that own and operate their own ESBs; school districts working with third parties should refer to their maintenance agreements.

How to Use the Guide

Tasks are color-coded in the table below to indicate when to prepare to take on a task and what level of training or capability is required:

Do now: Tasks to perform as part of routine ESB maintenance operations.

Build toward: Tasks to work toward taking on as your ESB fleet, staff experience, and maintenance operations grow.

Specialized training required: Tasks that require specialized training, appropriate tools, and additional safety procedures before you can take them on. Some tasks can affect the vehicle warranty, so consult your dealer or OEM beforehand.

Understand your fleet needs and capabilities, as well as the terms of your warranty and service agreements, before deciding which tasks to perform in-house.

Get Expert Guidance, Connect with Peers

Join the ESB Network to access the latest industry trends, best practices, and valuable insights from peers on similar journeys.

ElectricSchoolBusNetwork.org
SchoolBusTeam@catalystmobility.org

Maintenance Type	School District Fleet Responsibilities	Example Tasks
Initial Training	Ensure relevant staff attend the initial training conducted by the dealer and document it as needed. Dealers provide initial training when new ESBs are delivered. This training and hands-on exposure helps technicians better understand the vehicle's systems and prepare them to safely inspect and diagnose issues.	High voltage (HV) training is categorized into levels. Lower levels are provided with the delivery of the bus and include training on basic electric vehicle safety, HV component locations, charging, battery disconnect and isolation awareness, towing, storage, and basic operation. Low-level safety training teaches maintenance staff to distinguish between HV and non-HV systems by visually identifying HV cabling and components, testing for the presence of HV energy, and how to isolate and disable the HV system.
Driver Training and Daily Operating Practices	Receive driver training specific to ESB operations. Improper driving practices can contribute to avoidable brake and tire wear, buses not being plugged in or ready for service, and unnecessary range anxiety.	Training includes regenerative braking, charging and plug-in procedures, dashboard alerts, state of charge, and when to report problems. Recurring driver training serves as a refresher and reinforces proper ESB operating practices.
Facility Operations and Safety	Assess existing maintenance facilities and identify any upgrades or additional equipment needed to safely support ESB maintenance and repair.	Equip facilities with adequate work and isolation space, emergency and exit planning, fire-response equipment, personal protective equipment, insulated tools, and appropriate electrical test equipment.

Maintenance Type	School District Fleet Responsibilities	Example Tasks
Warranty Protection and In-House Handoff	Understand which types of repair work can void your vehicle warranties by checking your warranty agreements. Before performing unfamiliar work, maintenance, or repairs outside of your normal scope, confirm with the dealer whether it could affect warranty coverage, as losing that coverage can have significant cost implications.	Warranties commonly include high- or low-voltage auxiliary modifications, unauthorized HV work, improper charging, or modifications to wiring or the battery system. As warranties expire, more low-voltage (LV), diagnostic, and component work will move in-house as training and tooling improve.
Preventive Maintenance (PM) and Inspections	Perform PM work and inspections for all vehicles and chargers. Having a schedule and performing routine maintenance will help avoid sending the vehicle to a dealer or the OEM for repairs. Each vehicle comes with a PM schedule, provided by your dealer.	Additional ESB-specific PM includes checks of thermal-management components, 12V systems, fasteners and battery-cage torque, and visual inspections of the wiring and low- and high-voltage junction areas. Check out our Charger PM guide for recommended best practices to keep your fleet running safely and efficiently.
Escalation Path and Technical Support	Dealers are the first point of contact for technical support that school districts cannot resolve in-house. If dealer or OEM support is unavailable, contact qualified third-party service providers.	Be proficient in diagnosing and troubleshooting to facilitate transferring repairs to the dealer. The dealer is your first escalation point, especially for HV, software, battery, and warranty issues. Consult your dealer or OEM before performing unfamiliar work under warranty.

Maintenance Type	School District Fleet Responsibilities	Example Tasks
Basic Mechanical and Low-Voltage Repair	Perform basic mechanical and low-voltage LV repair work on ESBs. Most basic mechanical work remains similar to the work performed on an ICE bus.	Perform maintenance on components such as brakes, tires, wheels, seats, windows, lights, body and glass, filters, power steering, cooling and thermal-management items, and other non-HV components. LV (12V) work can be done in-house with proper electrical training and tooling. Many components that are fully replaced, rather than repaired, such as inverters, tend to be connected to the HV system; confirm before performing in-house maintenance.
Charging Infrastructure and Software	Monitor chargers, ensure buses are properly plugged in, identify charger-side faults, coordinate repairs, and determine whether maintenance is kept in-house or outsourced.	Monitor chargers, read codes, inspect wiring and connectors, distinguish bus-side from charger-side faults, and give the vendor a useful problem description if escalation is required. Maintenance involving electrical components beyond regular PM should be performed by a licensed electrician. When available, take advantage of training offered by charger providers so staff can diagnose basic charging issues and charger faults before escalating the issue for service.

Maintenance Type	School District Fleet Responsibilities	Example Tasks
Specialized Training and Technician Readiness	Consider dealer-, OEM-, or third-party-provided specialized training to staff to build confidence and in-house maintenance capabilities, which can help reduce vehicle downtime.	Higher levels of HV training include more in-depth instruction, such as electrical theory, specific ESB systems and diagnostics, applied vehicle maintenance, and troubleshooting. Be proactive and see if your OEM, dealer, or other organizations offer additional training courses beyond the initial training. These training sessions may require a fee and are generally technical and focused on a specific vehicle system or repair.
High-Voltage and Battery System Repair	Dealers handle HV and battery system repairs because those tasks are usually covered under the warranty. Dealers escalate issues to the OEM as necessary.	As technicians gain experience, more repair items will move in-house, such as LV and charger maintenance beyond regular PM. Dealers and OEMs cite that, in the long term, school districts will be able to perform their HV maintenance and repairs in-house.

Caution: When performing HV maintenance and repairs, you must obtain the proper certifications, perform lockout/tagout of the HV system, and wear personal protective equipment.

ANY QUESTIONS?

Please raise your hand or type your questions for our speakers in the chat!

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Thank You for Participating!

- A follow-up email will be sent **Friday, October 9**, with the following:
  - Recording of the meeting
  - Copy of the slide deck
  - A link to the ESB Maintenance Responsibility Playbook
- The next ESB Network Newsletter will be sent on **Tuesday, October 13**
- Mark your calendars for the next ESB Network Forum:
  - **December 2, from 1:00 to 2:00 p.m. ET**
- **Missed a previous Forum or want to rewatch? Check out the Session Archive**
- Please email schoolbusteam@catalystmobility.org with questions for our team

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