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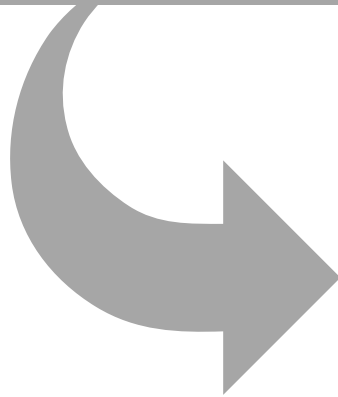


ELECTRIC SCHOOL BUS INITIATIVE MUTUAL AID AGREEMENT OVERVIEW

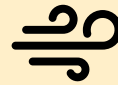
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WHY ELECTRIFY THE U.S. SCHOOL BUS FLEET?

Electrification can accelerate decarbonization while bringing direct, tangible benefits to every community



Improved health and cognitive outcomes for children



Cleaner air, especially in high-pollution corridors and communities of color



Reduced operating expenses for school districts



New jobs in green manufacturing



A **tipping point** for MHD + electrification



Enhanced **resiliency** and **renewables integration** with V2G



Issue Overview

- As more disasters occur, ensuring the resilience of communities is more important than ever.
- Underserved communities typically are hit the hardest by disasters:
 - Less resourced;
 - More densely populated;
 - Low income.
- Will encourage further ESB adoption.

Solution

Bidirectional
Enabled
ESBs
(V2X, V2B)

>

Diesel
Generators



Reasons V2X-Enabled ESBs are Well-Suited for Disaster Response

ESBs have:

- Regular schedules and routes with long idle times; and,
- Large batteries.
- Deployment is increasing, due to federal funding.
- Not generally transporting children during disasters.
- Transferable to other medium- and heavy-duty fleets, when they become available for bi-directional charging.



Benefits of V2X-Enabled ESBs for Resilience

By providing power to maintain essential services during disasters and outages, V2X-enabled ESBs:

- Enhance grid and community resilience;
- Strengthen our energy and national security; and,
- Decrease environmental and health impacts from diesel buses and generators.

Key Stakeholders

- Electric Utilities
- School District Officials
- School Facility Managers
- First Responders
- State/County/City Emergency Managers
- Electrical Contractors
- Public Utility Commissions and/or Regional Transmission Organizations
- ESB Manufacturers/Providers
- Charging Station Providers
- Service Providers

Implementation Steps Before an Emergency



- Develop and execute an MAA. (pg. 12)
- Identifying the resource needs (load and duration of backup power). (pg. 9)
- Specifying the requisite personnel and other stakeholders. (pg. 10)
- Determining software, hardware, and interconnection needs and other logistical priorities. (pg. 11)

Implementation Steps Before an Emergency



- Undertaking coordination efforts. (pg. 12)
- Analyzing additional potential needs. (pg.12)
- Conducting education and outreach; and, building support. (pg. 13)

Emergency Phase

- Identify and secure V2X-enabled ESB for the disaster. (pg. 13)
- Deploy V2X-enabled ESB. (pg. 14)
- Notify utility of use of V2X-enabled ESB for backup power. (pg.14)
- Island and connect ESB. (pg. 14)



Post-Emergency (Recovery) Phase

- Notify utility. (pg. 14)
- Disconnect ESB. (pg. 14)
- Determine amount of power consumed. (pg. 14)
- Recharge and park ESB;
conduct safety check. (pg. 15)
- Compensate ESB
owner/contractor and driver for
aid provided. (pg. 15)



Use of Mutual Aid Agreements (MAA)

Mutual aid agreements (MAA) establish the terms under which one party provides resources—personnel, teams, facilities, equipment, and supplies—to another party.

- V2X MAA template produced from - [National Incident Management System - Guideline for Mutual Aid \(fema.gov\)](#)
- MAAs can apply to specific emergency scenarios and will vary in scope (interstate, intrastate, local emergencies)
- MAA examples
 - [CA – Disaster and Civil Defense Master MAA](#)
 - [CO – Pueblo County Fire Protection MAA](#)
 - [NJ – Hazardous Materials MAA](#)
 - [Texas – Public Water Utilities MAA](#)

MAA Guidance

- Keep it Simple!
 - The focus should be on the intention. The more complicated the language, the less likely parties will want to participate.
 - Not everything needs to be determined now. If you need to put "TBD" you can!
 - The MAA is already being used. We have examples to follow. While ESBs as a resource in this capacity is new, we are looking to follow a similar agreement with an equipment supplier that would otherwise provide a mobile diesel generator
 - The MAA should survive employee transitions
 - As technology changes and more ESBs become available the MAA may need to be revisited and new ones may need to be developed.

THANK YOU

Please feel free to contact me:

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