

NARUC Electric Vehicles State Working Group

ELECTRIC SCHOOL BUSES

OCTOBER 21, 3:00 - 4:30 PM ET

Welcome

EV SWG Chair

Commissioner Katherine Peretick, Michigan Public Service Commission

EV SWG Vice Chair

**Commissioner Milt Doumit, Washington Utilities and Transportation
Commission**

EV Commission Staff Leads

Benjamin Baker, Maryland Public Service Commission

Steve Olea, Arizona Corporate Commission

NARUC Staff

Danielle Sass Byrnett

Margerie Snider, Jessica Diaz

Agenda

Feel free to enter
questions into chat at
any time

3

3:00 PM	Welcome and Announcements: Commissioner Peretick and Commissioner Doumit <ul style="list-style-type: none">• Agenda review
3:05 PM	Speakers: <ul style="list-style-type: none">• Kevin Matthews, First Student• Sue Gander, WRI• Amy McGuire, Highland Fleets
4:05 PM	Member Discussion
4:30 PM	Adjourn

Next EV SWG Meetings:

November 18, 3:00-4:30 pm ET
Utility Ownership of EVSE

December 16, 3:00-4:30 pm ET
Proactive Infrastructure
Investments & Planning

Upcoming Partner & NARUC EV Events

- ▶ **NARUC Annual Meeting & Education Conference**, November 9 – 12, 2025 in Seattle, WA
- ▶ **NASEO-AASHTO Western EV Charging Infrastructure Regional Meeting**, November 13 –14, 2025 in Salt Lake City, UT
- ▶ **NASEO-AASHTO Eastern U.S. EV Charging Infrastructure Regional Meeting**, December 9-10, 2025 in Washington, DC

If travel costs are a barrier to you attending one of these partner events, contact Danielle to discuss the possibility of a NARUC travel stipend.

WRI'S ELECTRIC SCHOOL BUS INITIATIVE

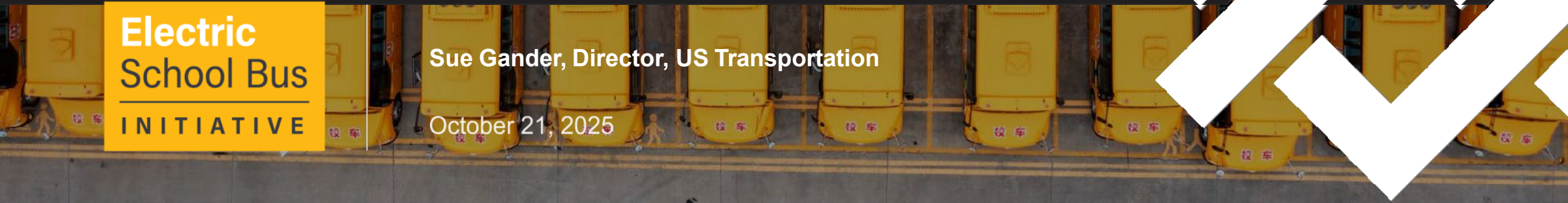
Driving Forward Together: The Role for PUCs



Electric
School Bus
INITIATIVE

Sue Gander, Director, US Transportation

October 21, 2025





DISCLAIMER

Images used in this presentation are for illustrative purposes only and are not meant to endorse any company, entity or brand.

WRI is a global research organization working to improve people's lives, protect nature and halt climate change.

WRI has country offices in Brazil, China, Colombia, Democratic Republic of the Congo, Ethiopia, India, Indonesia, Kenya, Mexico, Rwanda and the United States, as well as regional offices in Africa and Europe.

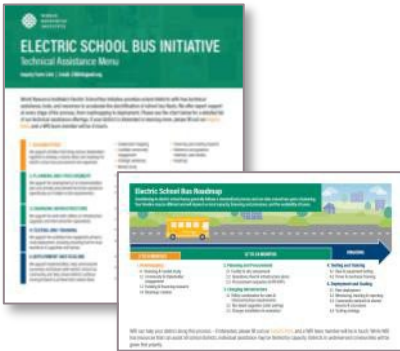


Our aim: Electrify entire U.S. school bus fleet

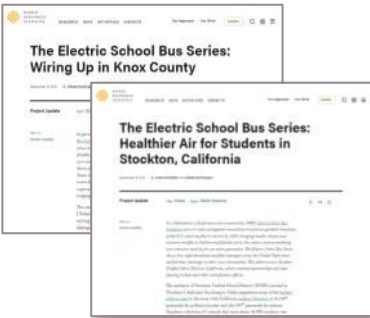
- Build -- unstoppable momentum to electrify 480,000 school buses in the U.S.
- Partner -- with communities, school districts, industry experts, manufacturers, utilities, and policy makers to transform and electrify the school bus market
- Ensure -- an equitable transition by focusing on underserved communities



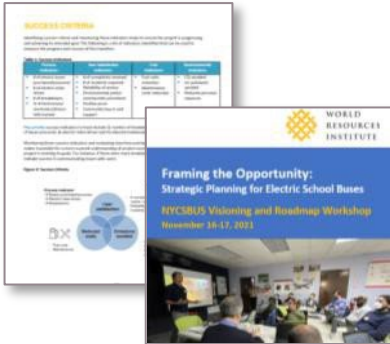
ESB Initiative resources



Technical assistance & instructional resources for school districts



Case studies sharing key learnings, best practices and practical knowledge



Partner-oriented strategic plans and roadmapping assessments



Dataset of U.S. School Bus Depots



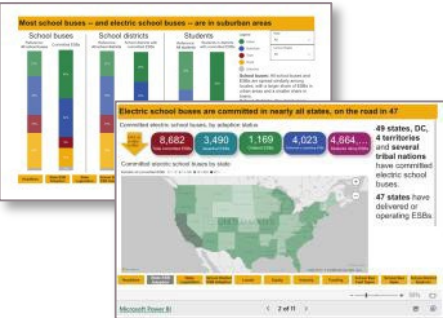
Step-by-step guide for school bus electrification



ESB Initiative Equity Framework and approach to prioritizing equity



Electric school bus US Market Study and Buyer's Guide



Electric School Bus Data Dashboard

Dataset of U.S. school bus depots

| The distribution of school bus depots in the 48 contiguous U.S. states and Washington, DC



The dataset **contains 11,309 depots** across the 48 contiguous U.S. states and Washington, DC.

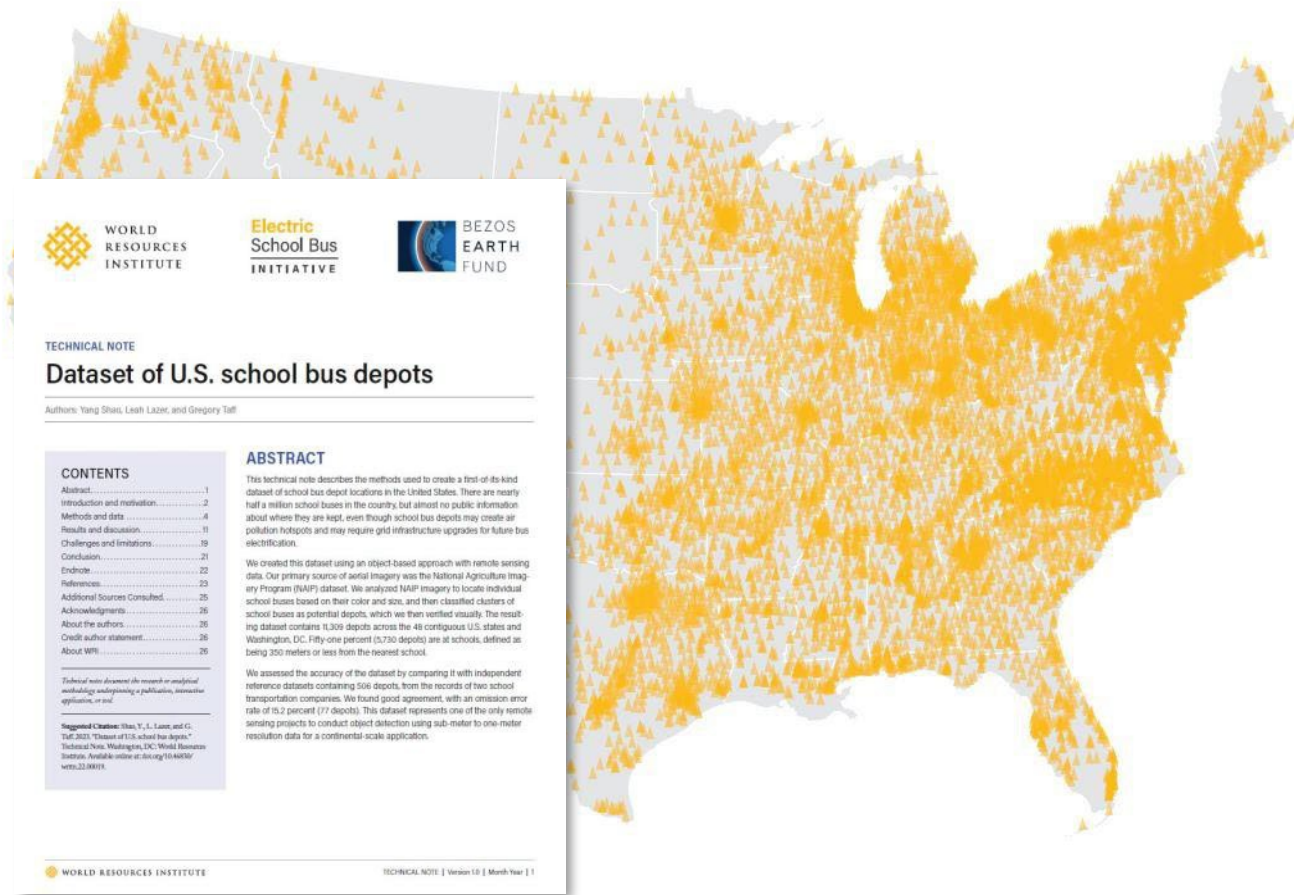


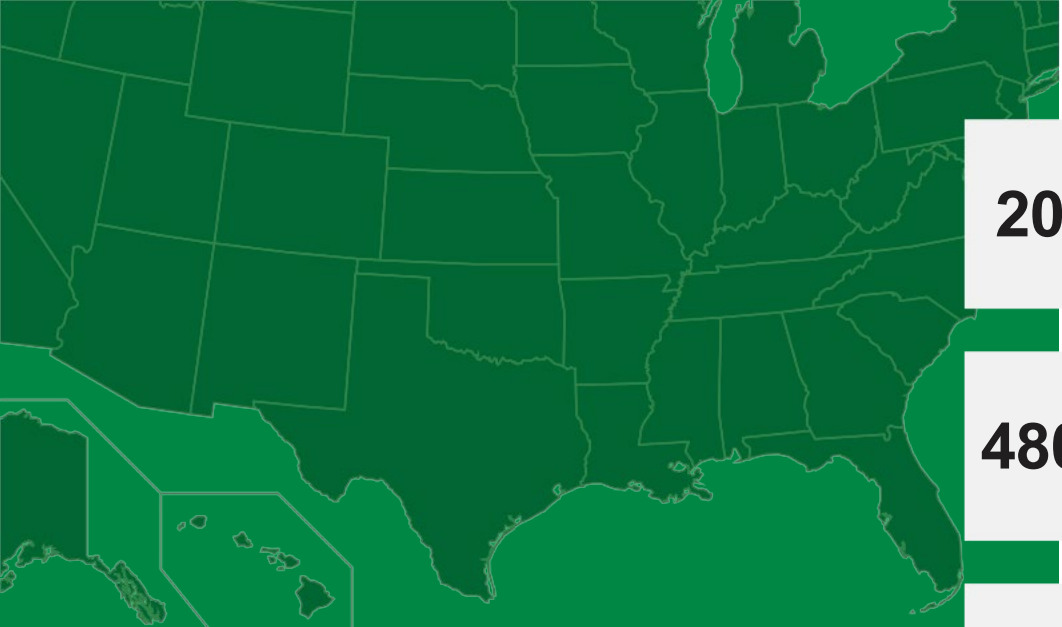
About 51% (5,730 depots) are **located at schools**



School bus depots can create **air pollution hotspots**, which can lead to health issues

More analysis on the way!





The WHY of Electric School Buses

20M

20 million students served by the U.S. school bus fleet every day

480K

480,000 total vehicles in the U.S. school bus fleet

7B

7 billion combined trips taken by vehicles in the U.S. school bus fleet each year

+

Converting these buses to electric ensures a **healthy ride for children, drivers and communities** and **lowers operational costs**

+

While also providing **climate benefits and building grid resiliency.**



ESBs Create Jobs and Growth

Electric school bus investments support manufacturing jobs across the supply chain throughout the United States:

- ✚ **Manufacturing Jobs**
 - 19+ manufacturers, 21+ facilities in 13+ states
 - 1,500+ new direct ESB manufacturing jobs for the local economy
- 👤 **Jobs: OEMs and Beyond**
 - Company new to ESB manufacturing: GreenPower.
 - New Micro Bird facility in Plattsburgh, NY
 - Growth in related industries (seats, wiring) and battery recycling
- 🏛️ **State-level Impacts**
 - Manufacturing Hubs are in GA, MI, IN, NC, SC, OK, and WV.
 - Recent investments from Microbird in a new New York facility.

Higher upfront costs

Infrastructure development

Learning new technology

Technology myths

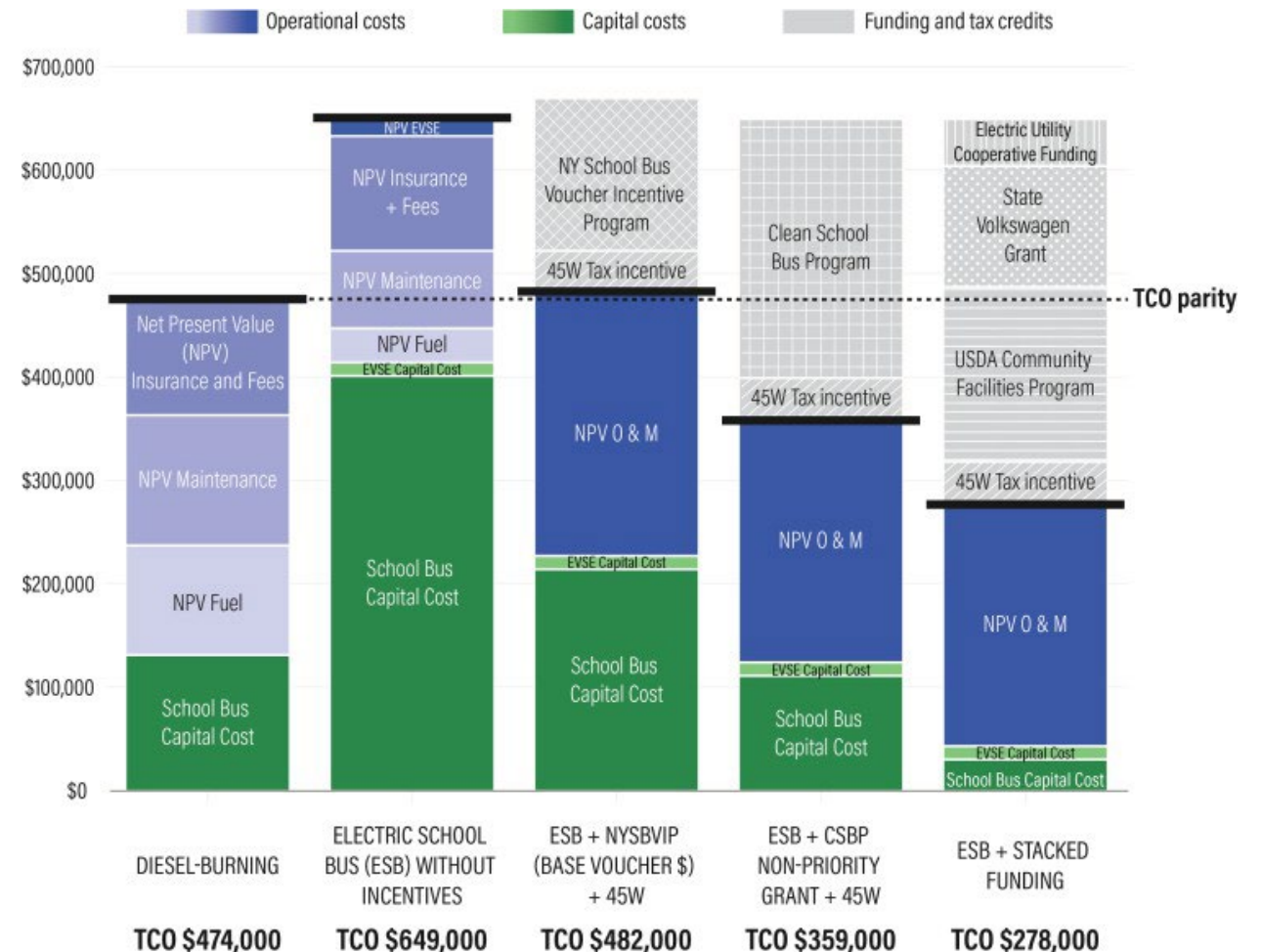
Needs to scale quickly

These disproportionately impact underserved communities

Challenges Facing Electrification

Bus total cost of ownership (TCO)

After incentives, the TCO for electric school buses can be **hundreds of thousands of dollars less** than the TCO of a diesel-burning school bus.





490K

490,000+ school buses in the U.S.



1%

About 1% of school buses on the road are electric (**5,000**)



49

School districts in **49 states** have deployed ESBs



\$8B

\$5.5B in federal funding + \$2.5B in state funding

Current Status

Electric School Bus Adoption

13K

13,900+ electric school buses committed, procured, delivered or in operation as of July 2025

1,542

1,542 districts and private fleet operators

36%

36% are in school districts with the highest shares of low-income households

49

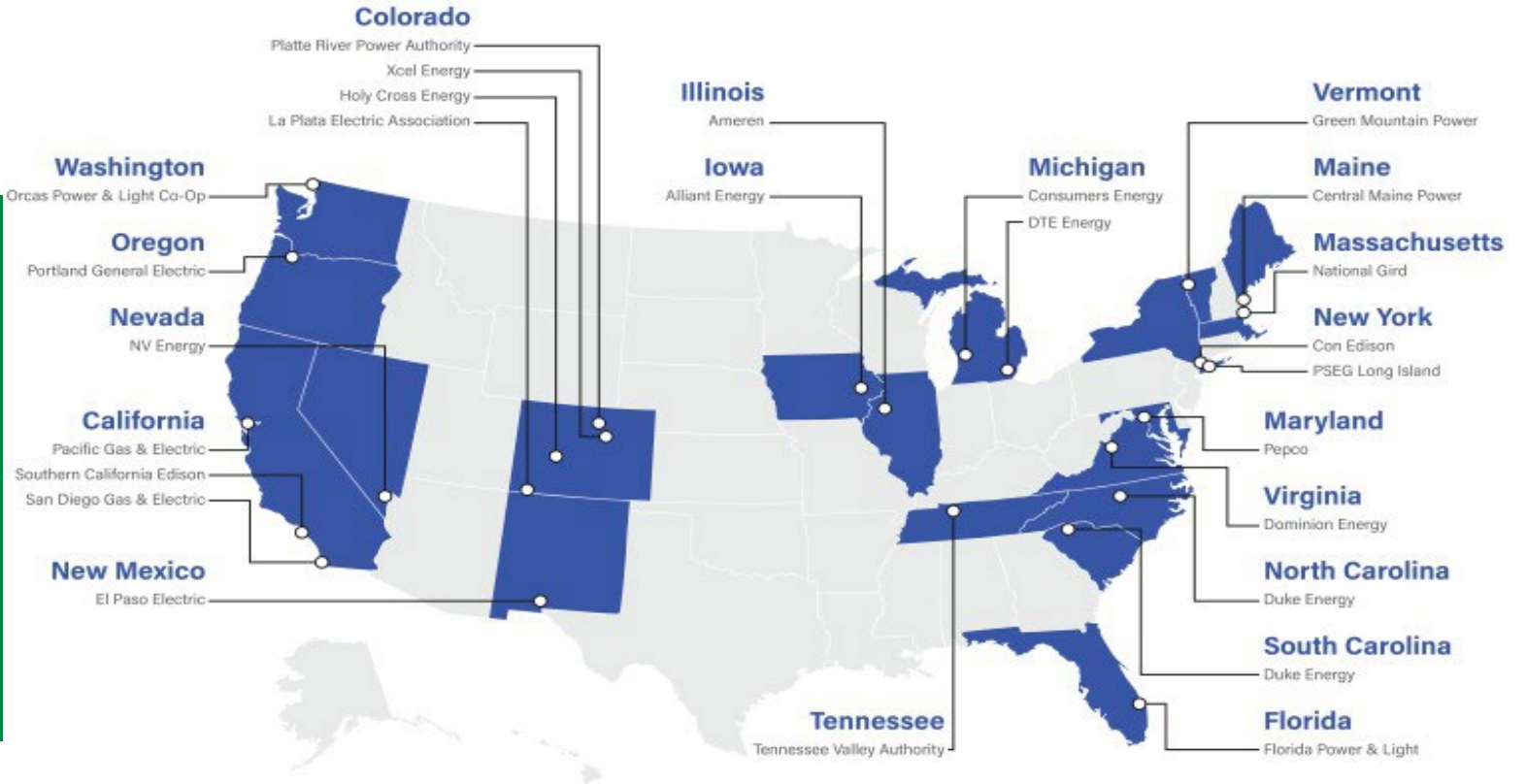
Commitments in **49** states, D.C., several territories and Tribal nations

60%

60% of electric school bus commitments are in non-urban areas: suburban areas (35%), towns (8%), and rural areas (14%) versus cities (40%).



Electric school buses are proving their potential as grid assets



Source: Authors.
25.04.17

Electric School Bus INITIATIVE



**Fleet Advisory
Services**

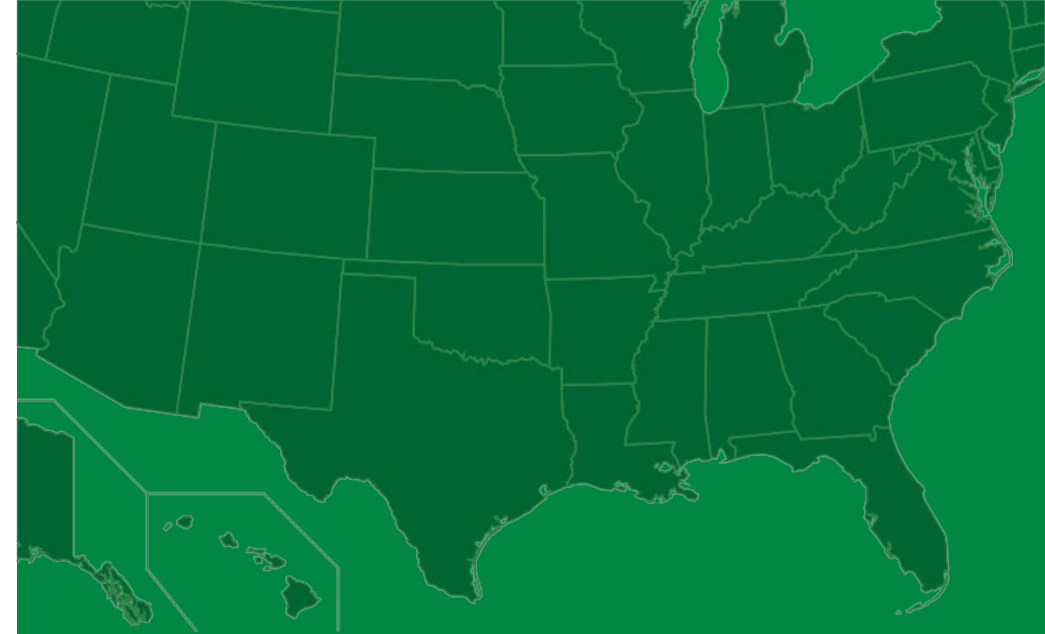
**Make Ready
Programs**

Proactive Planning

Flexible Connection

**Managed Charging +
V2X**

Many tools are
tried and true and
ready for
deployment at
scale



How PUCs Can Help

Electric School Buses – What V2G Could Mean to Communities

October 21, 2025



The most trusted transportation provider



1 Billion

Annual Student
Trips

20,000

Schools
Served

~46,000

Vehicles

63,000+

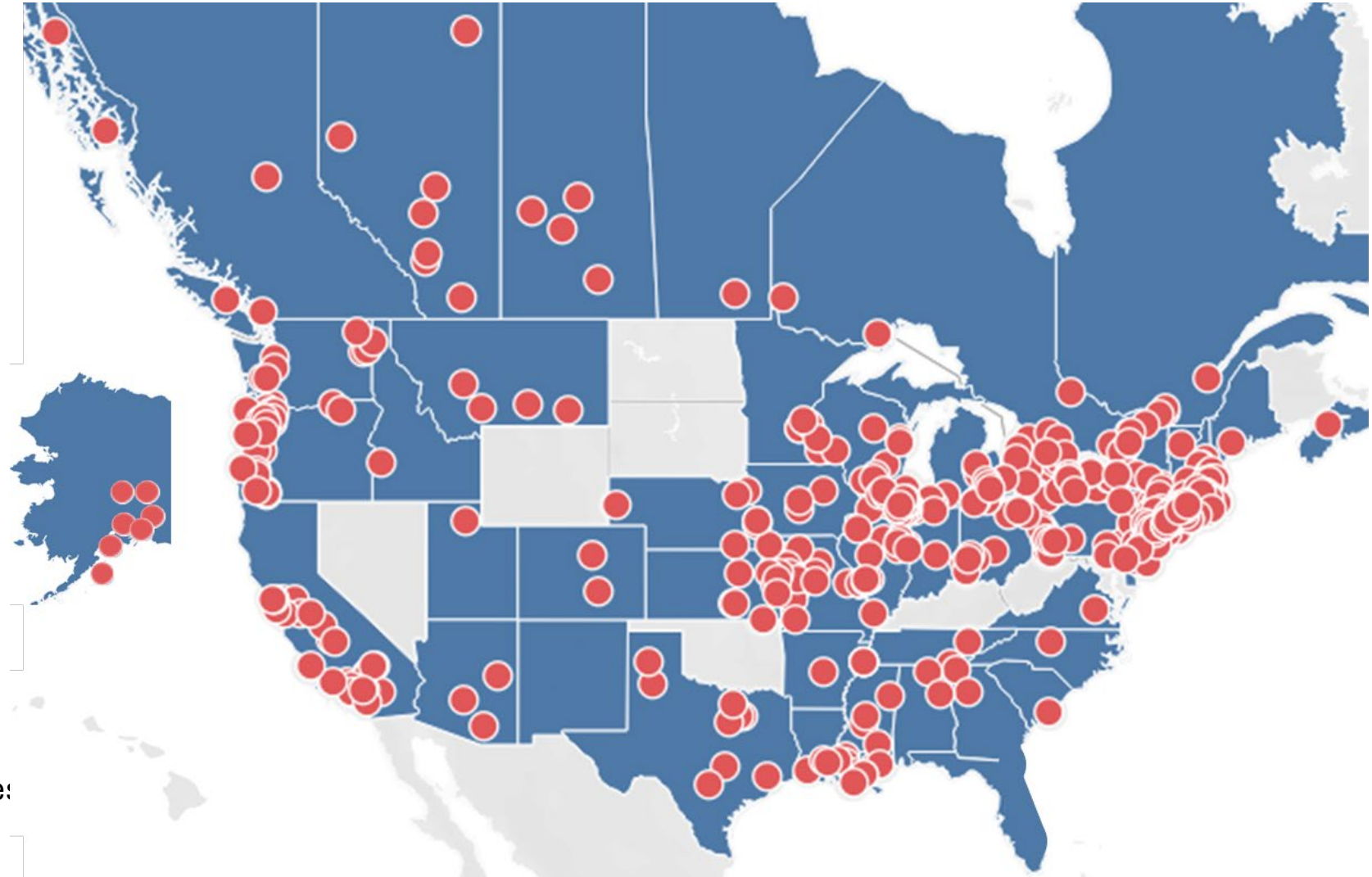
Employees

545

Operating
Locations

42 | 8

US States |
Canadian Provinces



Electrification awards





The school bus fleet is considered the nation's largest public transportation system in the U.S.

40 buses

Average fleet size for School Districts



13,000

school districts



490,000

school buses in operation



26 million

students 2x a day



Over 10 billion trips annually



Less than
6k
EBs operating



14k buses

committed for adoption by school districts and fleet operators





Current view

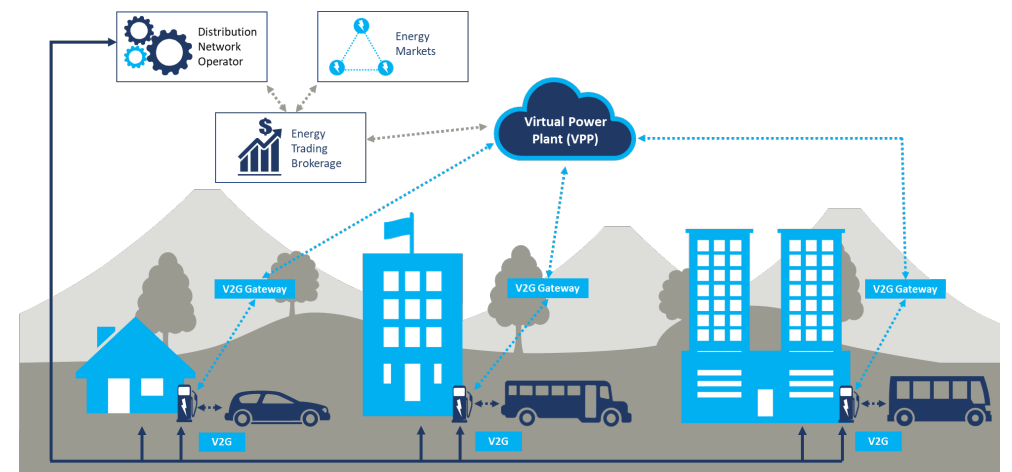
- At the school district level, superintendents talk positively about bringing in EVs until they see what it is going to cost
- They want to spend dollars in the classroom – not outside (Avg. SD Transportation Budget is 8-12% of total SD Budget)
- We have a problem bringing more EVs to the market
 - Fully dependent on Grants and Incentives from public sector and utilities
 - Grants are likely finite – EPA Program expires end of Sept. 2026
- We need new revenue that will help bring down the cost of student transportation



Solutions



- School buses sit 80% of the hours of a year
 - Summer
 - Weekends
 - Holidays
- V2G
 - Usage pattern of school buses is very much in line with when the grid needs the most amount of energy (4pm – 9 pm – M-F; ESBs parked)
 - Most ESBs return from afternoon routes with 40-60% SOC
 - There are impediments to V2G
 - There is no regulatory framework across the states that allows us to know what kind of revenue we can bring to the table if we plug into the grid
 - Bi-directional infrastructure costs 30 - 40% more





Thinking differently

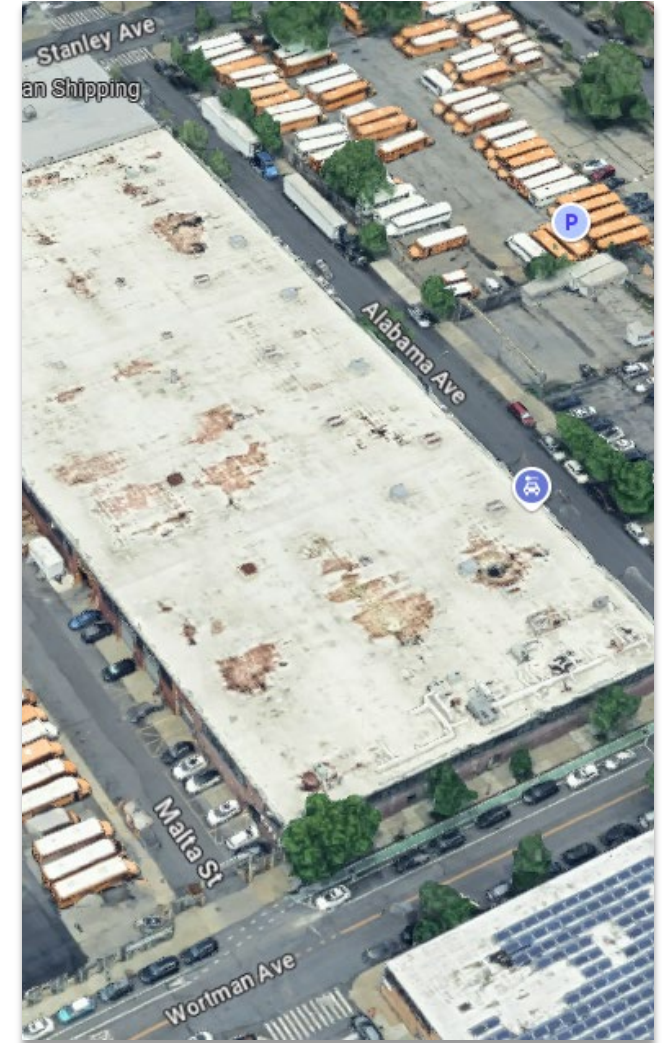
- 100 ESBs sitting in a parking lot translates into:
 - 100 chargers at 30kw for a total of 3 megawatts of power
 - We would be pushing energy back to the grid during peak hours
 - Total capacity being at 100%, we would be able to push 1.8 megawatts of power to the grid
 - If we assume V2G after afternoon routes and during peak hours, it would be approximately 900k to 1 megawatt of available power to push back to the grid
- An ISO/RTO developed a revenue model for one of their existing energy market for one of our locations in their territory – using operational parameters we provided
 - FINDINGS: \$18K per year per bus – even at \$10K per bus makes a meaningful cost of ownership for a district
- How many potential MW of storage could be sitting in your community/state through ESBs

Con Edison



Brooklyn Demonstration Project

- First Student, ConEd and Bechtel Engineering
- Awarded a \$9M dollar grant from ConEd
- Project will showcase how ESBs combined with solar energy and First Charge can function as a virtual power plant
 - Solar panels on top of 12 ESBs
 - First Student depot at Malta Street in Brooklyn will have a 500-kilowatt solar array installed on the rooftop
 - Depot will be equipped with a two-megawatt battery system to store energy generated from the solar panels
 - Stored energy is used to charge buses during off-peak hours, ensuring efficient power use
- Buses will still transport students, but will all be mobile storage units, with the ability to provide electricity to the local grid, hospitals, schools, or emergency shelters during emergencies

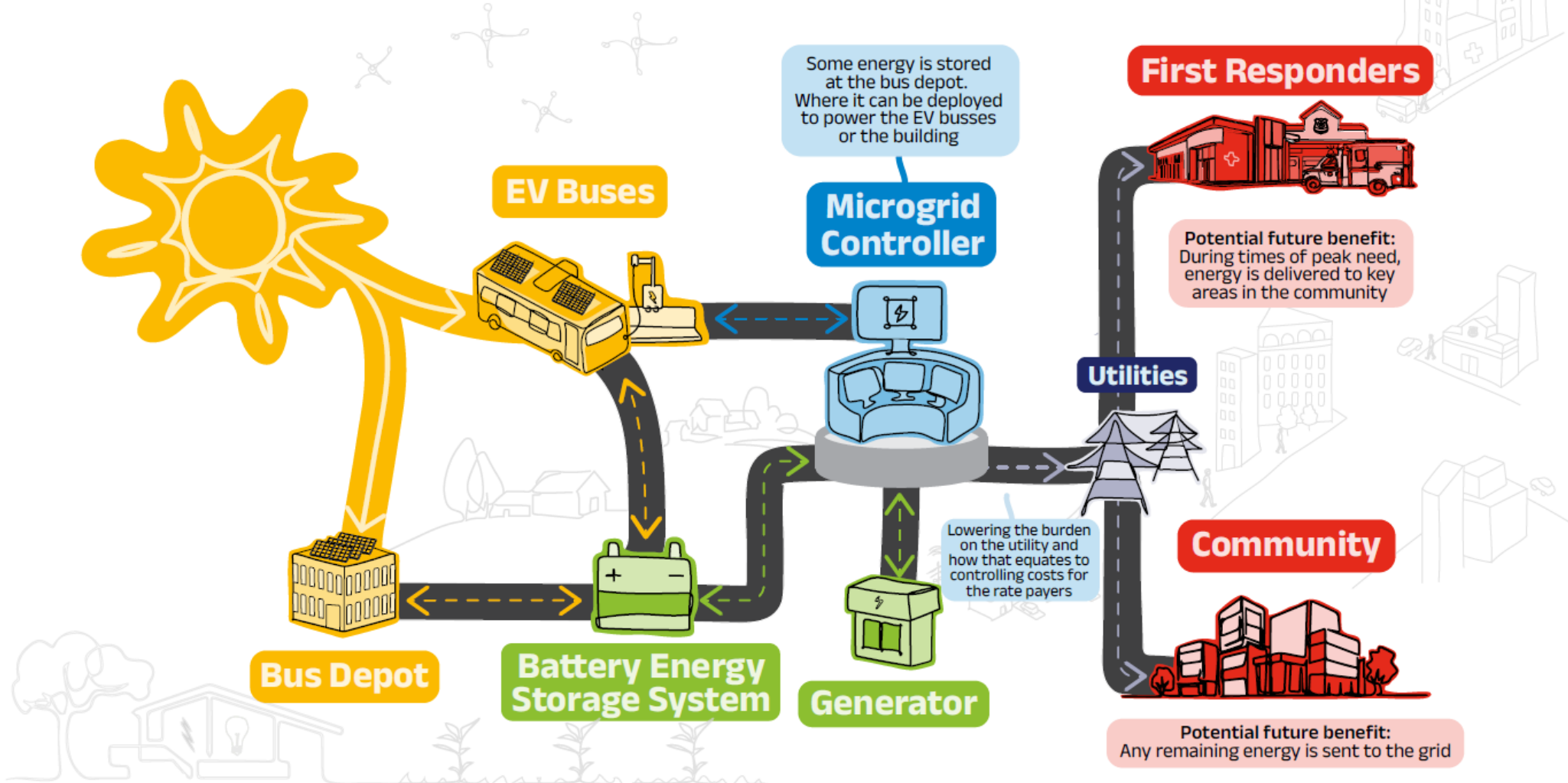


The possibilities for the future are endless



The First Student / Con Edison Vehicle-To-Everything Smart Energy Hub in Brooklyn, NY:

A New Energy Generation, Battery Storage and Power Delivery System Using Solar Powered Electric School Buses





The Ask – Our Nation's Children are waiting

- Pilot programs are welcomed – First Student is participating in 8
- Regulatory Action to affirm V2G/V2X programs is needed
- School Bus Operators need to know there is a path to revenue to deploy EVs (Bidirectional infrastructure +30-40% cost)
- Could utilities buy EVs for school districts if they are tied into the grid?
- V2G/V2X programs can accelerate the adoption of zero emissions school buses in the U.S.
- Electric School Buses can lead the way to understanding and advancing V2G/V2X - move the yellow school bus from being the red head stepchild of the transportation industry – to the most cutting-edge vehicle on the road
- We need to partner with you to make this a reality



The path to electrification isn't walked alone



- We take the journey together as an industry to destination zero
- We apply best practices across varying environments
- We all share the same common goal of leaving future generations a better place
- We are here to help you be successful





Kevin L. Matthews
Head of Electrification
First Student

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Highland Fleets

AMY MCGUIRE

SENIOR DIRECTOR, MARKET DEVELOPMENT

Member Discussion Questions

- In your state:
 - What is the status of any pilot programs, utility filings, or stakeholder requests for electric school buses?
 - Do you have any challenges or successes with adoption to share?

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