Highland

Houston-Galveston Clean Cities Stakeholder Meeting

February 2023

The Highland story

Founded in 2019

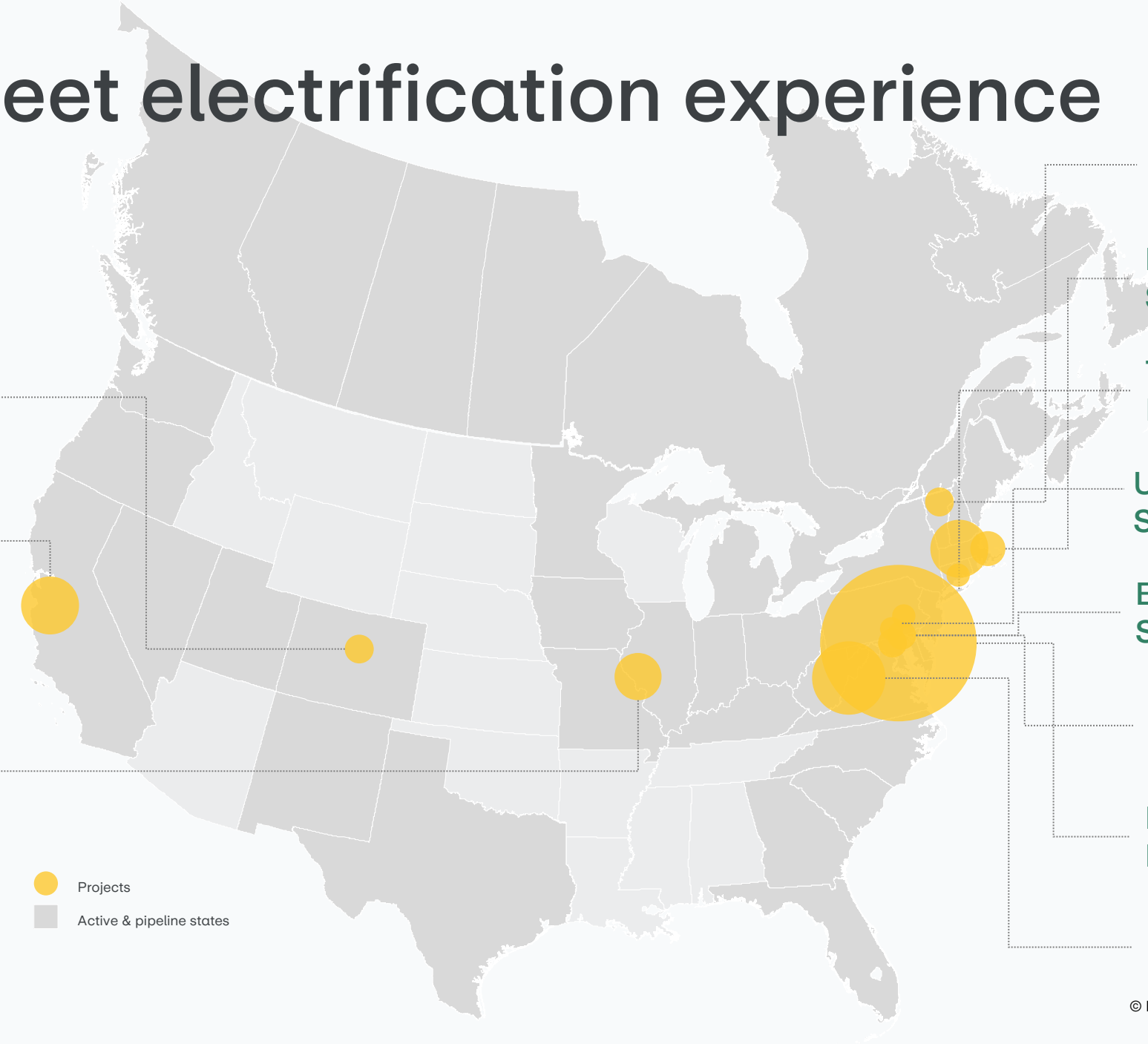
$253M capital raised

Largest electric school bus project in North America:
MCPS, Maryland

First commercial electric school bus V2G program in the U.S.

Leader in public-private partnerships: 375+ buses under contract

Broad fleet electrification experience



Peak to Peak Charter Schools, Inc., CO

Salinas City Elementary School District, CA

Hardin County Community District No. 1, IL

South Burlington School District, VT

Beverly Public Schools, MA

Third-party Fleet Manager, Dracut, MA

Unionville-Chadds Ford School District, PA

Baltimore City Public Schools, MD

Baltimore County Public Schools, MD

Montgomery County Public Schools, MD

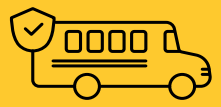
Manassas City Public Schools, VA

BUILDING YOUR ELECTRIC SCHOOL BUS FLEET

Why not go electric?

More affordable, cleaner student transportation

Highland



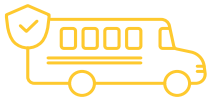
A reliable electric fleet - without the headaches

Cleaner buses, healthier communities

10%+ savings vs. cost to purchase, fuel, and maintain diesel buses

More affordable, cleaner student transportation

Highland



A reliable electric fleet - without the headaches

Cleaner buses, healthier communities

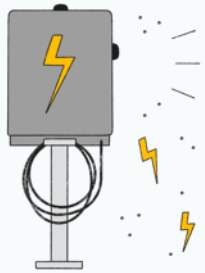
10%+ savings vs. cost to purchase, fuel, and maintain diesel buses

Implementing an electric fleet is complex

Successful electric fleets include infrastructure, operations, and energy management

Interconnection & Infrastructure

- Utility interconnection and new service
- Primary & secondary construction
- Engineering, permitting, and grant compliance



Chargers & Charge Management

- Charger selection, connectivity, and maintenance
- Charger & fleet management software
- Utility connection for charging & vehicle-to-grid (V2G) events

Operations & Maintenance

- Procurement, testing, and commissioning of each vehicle
- Driver & mechanic training
- Routine and unexpected maintenance

Complexity takes up time & resources

Electrification & fleet operation requires up to:

1,000+ hours of labor

12-18 months of planning & implementation

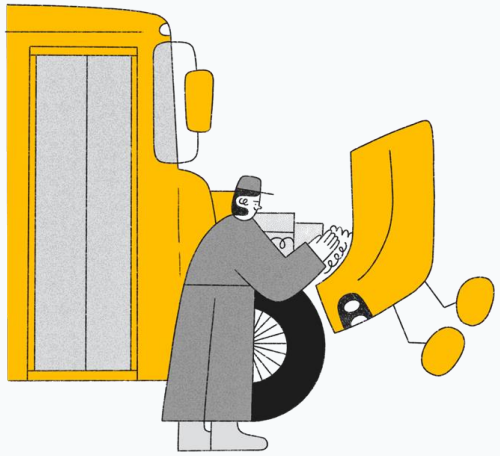
5+ dedicated FTEs

3+ subcontractors

Electrifying my fleet alone was like having a second full-time unpaid job for two years. It took a lot of time and planning, a team of people, and a lot of homework.”

— Tim Shannon, Director of Facilities Planning & Efficiency, Twin Rivers Unified School District

A reliable electric fleet without the headaches

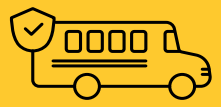


1	**Plan**	We design and implement the entire project.
2	**Budget**	We create a budget together that encompasses all aspects of your electric fleet.
3	**Build**	We procure school buses & infrastructure and manage the construction of depot upgrades.
4	**Train**	We train your drivers & mechanics to operate & maintain your new fleet.
5	**Charge**	We charge the school buses during off-peak hours, ensuring a “full tank” before each trip.
6	**Maintain**	We provide a complete service plan, reimbursing for all repair costs, including parts and labor.

Our Guarantee: Buses will be charged & route-ready every school day – if not, we pay for the downtime

More affordable, cleaner student transportation

Highland



A reliable electric fleet - without the headaches

Cleaner buses, healthier communities

10%+ savings vs. cost to purchase, fuel, and maintain diesel buses

Health issues associated with diesel buses

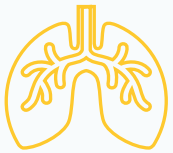
Across the board, diesel fumes are harmful to our communities

Children riding diesel buses have

16%

More Exposure

TO INHALED NOx & AIR POLLUTION [1]



Air pollution exposure leads to

7%

Higher Risk

OF PEDIATRIC ASTHMA HOSPITALIZATION [2]

Students riding clean school buses have

8%

Less Absenteeism

THAN STUDENTS RIDING DIESEL BUSES[1]

Exposure to air pollution is linked to **impaired cognitive development & lower academic performance** [3]

*Citations located in Appendix

Cleaner buses, healthier students

Reduce pediatric asthma risk by going electric

First Phase of Deployment

5 electric buses will reduce pediatric asthma risk for:

1,500
STUDENTS*

Secondary Deployment

100 electric buses will reduce pediatric asthma risk for:

30,000
STUDENTS*

*Note: Based on Montgomery County Public School ridership figures

ELECTRIC FLEET

Community benefits

School Budgets
Restore balance to your transportation budget with predictable pricing.

Academic Success
When your students breathe cleaner air, they miss less school and perform better.

Community Health
Emissions-free vehicles eliminate toxic diesel fumes from school yards and neighborhoods.

Driver Satisfaction
Recruit and retain drivers with clean, quiet, and easy-to-drive vehicles.

Emergency Resilience
As Distributed Energy Resources (DERs)—batteries on wheels—electric school buses can power your community in an emergency.

Environmental Justice
Electric school buses improve air quality for traditionally poor and underserved communities.

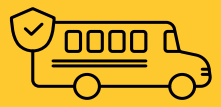
Climate
Upgrading your fleet to electric reduces pollution & greenhouse gas emissions.

Grid Modernization
With vehicle-to-grid technology (V2G), electric school buses are helping build America's new energy grid, buffering peak demand and providing storage capacity for renewable energy.

*Citations located in Appendix

More affordable, cleaner student transportation

Highland



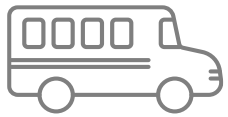
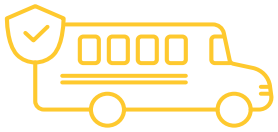
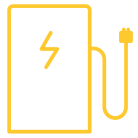
A reliable electric fleet - without the headaches

Cleaner buses, healthier communities

10%+ savings vs. cost to purchase, fuel, and maintain diesel buses

10%+ savings, guaranteed

Highland reduces the cost to purchase, fuel, and maintain your fleet

	BUSES	FUEL	MAINTENANCE
Diesel Fleet	 Market rate	 Market rate	 Market rate
Highland Fleet	 Highland discounted bus pricing	 Electricity delivered below diesel costs	 Warranty + maintenance reimbursement

10%+ savings, guaranteed

How do we do it?

Bus costs ↓

- Asset depreciation
- State & federal grants
- V2G participation
- Bulk orders & contracts

Fuel costs ↓

- Long-term energy purchasing
- Managed charging & energy optimization software
- Scalable electric depot construction & operation

Maintenance costs ↓

- EV technology expertise
- Lower cost of operation EV vs. diesel

No upfront costs & a long-term electrification partnership

A fixed payment for your entire fleet

With a long-term Highland partnership:

No upfront costs

Performance-based 10-15 year contract with no upfront cost or time investment.

Predictable budgets

One contract for design, implementation, and operation. Everything is included in one simple, annual price.

Fixed operating costs

Fuel and maintenance costs are locked in for the duration of the contract.

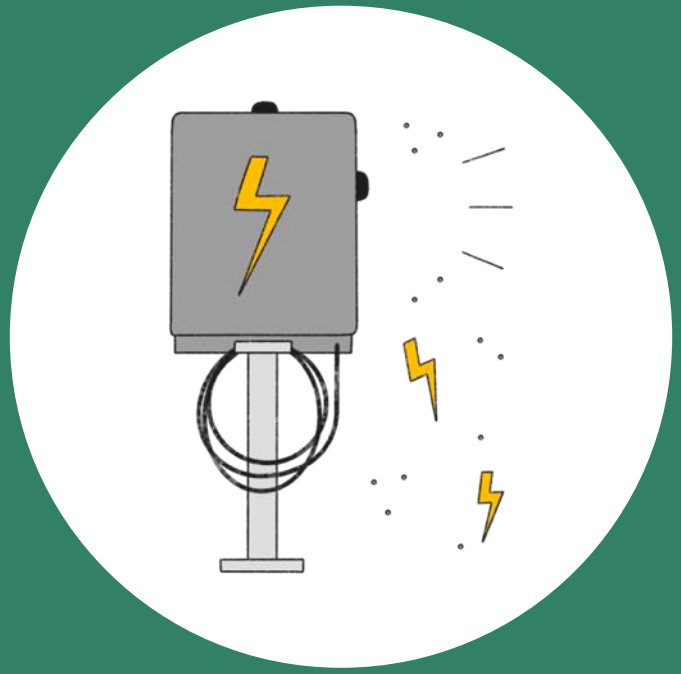
Why now?

Policy Support

IRA/EPA incentives

State policies/mandates

Utility programs



Major Manufacturers, Track Record

OEMs committed to electrification

1,700+ electric buses on the road for 5+ years

Business Model Innovation

Zero upfront cost

Lower cost of operation

Summertime V2G

Thank You

Claire Alford
832.797.1460 | Claire@highlandfleets.com

Appendix

Highland Guaranteed Pilot

Customer Testimonials

Solving electrification complexity

Sample Project Timelines

Vehicle-to-grid (V2G) with Highland

Industry Partnerships

Highland Products – Fleet, Depot, Dashboard

Beverly Case Study

Montgomery County Case Study

Citations

Highland Guaranteed Pilot

Guaranteed pilot fleet in the ‘23-24 school year

- Minimum 2 bus pilot fleet
- **10%+ savings** vs. cost to purchase, fuel, and maintain diesel buses
- Expedited depot electrification
- Signed contract required by March 31st, 2023

The buses are quiet and fun to drive. And the students seem to enjoy the ride, too! From the initial concept to rollout, Highland has been there every step of the way, answering questions and getting answers to new questions as they come up. They've made a complicated process smooth and simple."

— Jim B., Transportation Depot Manager

Reliable buses in every climate

> Our electric bus handled great all winter -- in the rain, snow, and sleet. With diesel, I had to warm the engine up for 30 minutes and now I’m ready to go in 5-10 minutes. My visibility is better since the windows don’t fog up as much with the electric heating system. Plus, the fans & heating system are quieter, so I can hear the kids better if they need me.”

— Gerrie Cahill, Driver, Beverly Public Schools

We’re thankful for the partnership, as well as for the prospect of a long-lasting relationship with Highland. Their clear dedication to customers, vision for a future of zero-emissions school buses, and unique model of providing a holistic, turnkey solution is the perfect complement to our own engineering and manufacturing expertise.

— Kevin Bangston, President and CEO, Thomas Built Buses

Solving electrification complexity

	Legacy Fleet	Going Electric Alone	With Highland
Vehicle Ops			
Fueling			
Maintenance			
Utility Electricity Cost			
Training	–		
Construction	–		
Planning & Permitting	–		
Charger Management			
Financing & Grants			

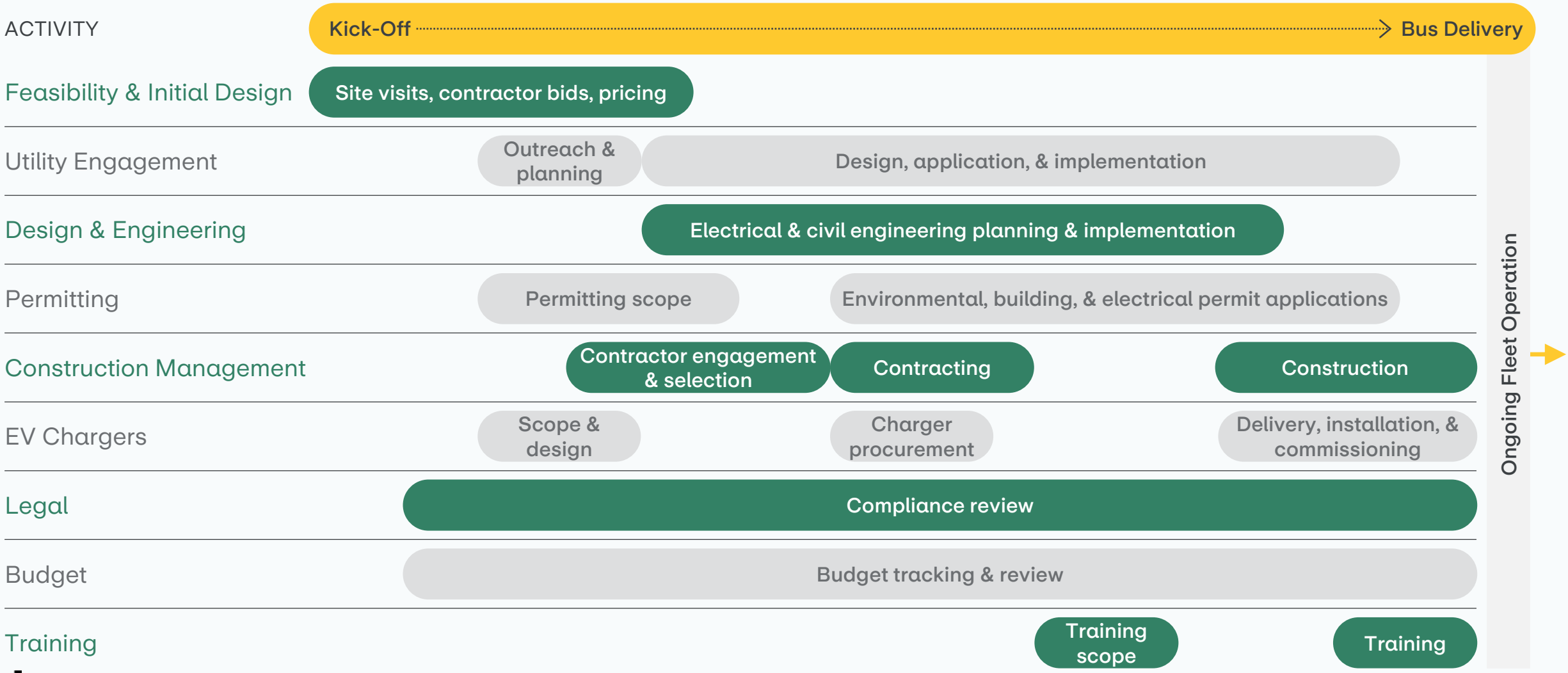
Highland makes it simple.

We manage the complexity so you can focus on what you do best.

FLEET MANAGER

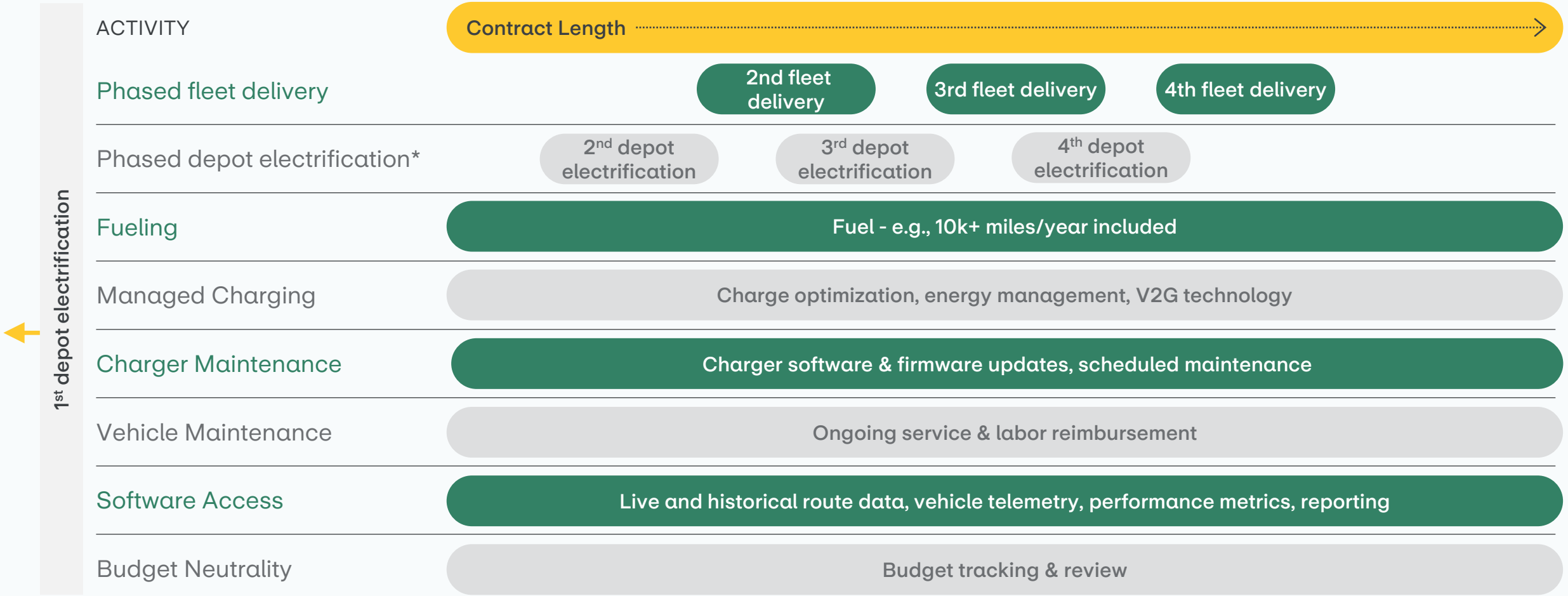
Sample depot electrification timeline

Project development must begin at least 12–18 months before buses arrive



Ongoing electric fleet operation

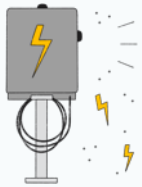
Highland supports fleet operations for the duration of the 10–15-year contract



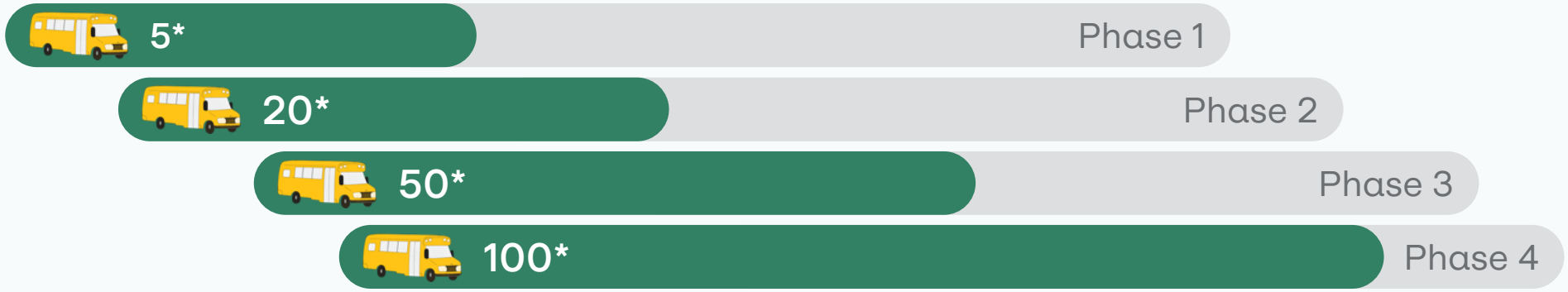
*Additional depot construction or existing depot expansion

Phased & future-proofed fleet deployment

Electrify at your own pace and save on construction costs



Depot Electrification



How to future-proof your electric depot

1. Plan for phased electrification by installing underlying infrastructure for the next 10+ years.
2. Only break ground once. Save on construction costs by doing it right the first time.
3. Start with a smaller deployment and build the skills needed to operate a larger electric fleet in the future.

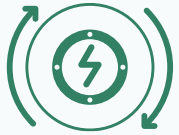
*Number of buses/phases are illustrative and at the discretion of the district

Vehicle-to-grid (V2G) with Highland

# OF BUSES	ENERGY CAPACITY	IMPACT TO COMMUNITY
25	5 MWh	116 Local Homes for 1 Day
275	58 MWh	1,400 Local Homes for 1 Day
1,100	231 MWh	5,500 Local Homes for 1 Day

Electric school buses are essentially batteries on wheels. They're ideally suited to provide capacity, stability, and emergency power to the grid.

500k electrified buses add 60GWh of storage capacity.



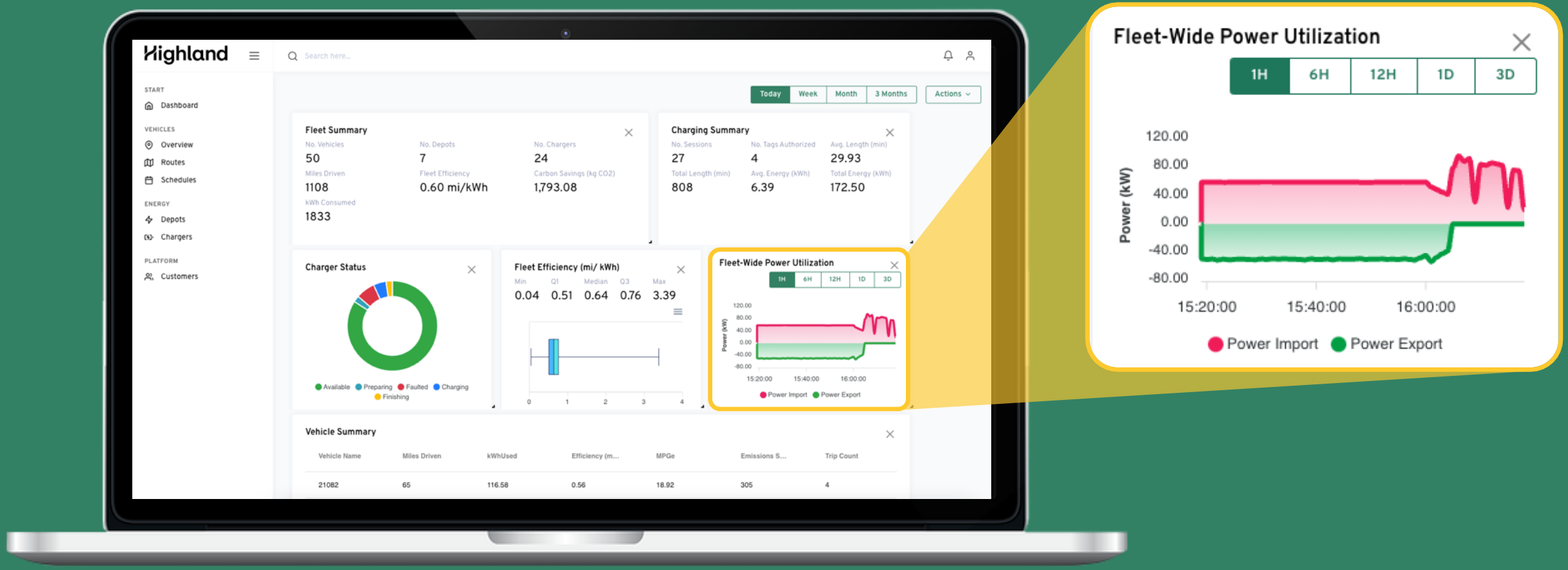
Highland uses V2G participation to offset the upfront cost of electric buses and make your fleet more affordable.

Real Results

In the summers of 2021 and 2022, Highland orchestrated a commercial V2G program with National Grid in Beverly, MA, that sent **10.8 MWh** back to the grid over **158 hours**.

V2G events with Highland

Dashboard: Highland's charge & fleet management software



Industry-leading partnerships

BUSES

Thomas Built Buses

BLUE BIRD

DISTRIBUTED ENERGY RESOURCES

voltus

CPower

CHARGER INFRASTRUCTURE

Rhombus Energy Solutions

POWER ELECTRONICS

SOFTWARE

Synop

UTILITIES

pepco

nationalgrid

GREEN MOUNTAIN POWER

Xcel Energy

FINANCIAL PARTNERS

VISION RIDGE PARTNERS

FONTINALIS PARTNERS

ELECTRIFICATION PARTNERS

PROTERRA

Purchasing Scale allows us to secure a strong equipment pipeline at attractive prices

Close Relationships enable us to quickly address any issues that may arise

The right product for your district

Highland's offerings are customized to meet your needs

Savings

10%+ savings vs. cost to purchase, fuel, and maintain diesel buses

Simplicity

Just plug in your buses and let Highland handle when they charge.

Reliability

Know your buses are charged and ready to go, every day.

H: Fleet

Our all-inclusive electric bus fleet solution, Highland Fleet includes everything you need to transition your fleet to electric - planned & implemented together at your pace.

- School Buses
- Chargers
- Training
- Maintenance Cost
- Fleet & Charge Management

H: Depot

For districts with existing electric vehicles, Highland Depot upgrades your infrastructure - providing reliable chargers, affordable fueling, coverage of unexpected repairs, and software to manage your fleet.

- School Buses
- Chargers
- Training
- Maintenance Cost
- Fleet & Charge Management

H: Dashboard

Dashboard is the software tool built for districts with electric buses & reliable charging infrastructure. Dashboard connects and coordinates all aspects of your electric fleet - keeping your school buses charged, reliable, & safe.

- School Buses
- Chargers
- Training
- Maintenance Cost
- Fleet & Charge Management

EPA Clean School Bus Program (CSBP) Guidelines

https://www.epa.gov/cleanschoolbus

HR 3684

The Bipartisan Infrastructure Law's Clean School Bus Program (CSBP) provides an unprecedented $5B to spur the transformation of the nation's fleet of school buses.

The Program

- Under Title XI: Clean School Buses, the Bipartisan Infrastructure Law (BIL) provides $5 billion over five years (FY22-26) for the replacement of existing school buses with clean school buses and zero-emission school buses
- The first funding opportunity under this program will be the 2022 $500MM Clean School Bus Rebates
- Half of the $5 billion total funding is dedicated for zero-emission school buses
- Half of the $5 billion total funding is dedicated for clean and zero-emission school buses
- Random number generator lottery process
- One application allowed to replace up to 25 units
- First round applications May 2022-August 2022, selection process September 2022, notification of award October 2022, PO & payment request forms through April 2023, deadline for implementation October 2024
- Eligible applicants: SDs, non-profit school transportation associations, Indian Tribes & eligible contractors
  - Sell EVSBs or related charging or fueling infrastructure to school bus owners or arrange financing for such a sale
  - VARs & OEMs are eligible contractors
- 2010 operational Type A, B, C & D diesel bus(es) scrap or scrap, sell or donate 2011 or newer units
- New replacements must be MY21 or newer
- Districts must own EVSBs
- Prioritization criteria
  - 2020 Small Area Income & Poverty Estimates (SAIPE) 20% or more students living in poverty
  - Rural SDs with National Center for Education Statistics (NCES) locale codes "42" & "43"
  - Tribal SDs

EPA Clean School Bus Program (CSBP) Funding

https://www.epa.gov/cleanschoolbus

Funding Levels

This tables display the maximum funding levels—the EPA will not disburse rebate funds in excess of the actual infrastructure costs.

EVSB Funding

School District Prioritization Status	Maximum EVSB Funding Amount Per Unit	
	Type A EVSBs	Type C& D EVSBs
Buses serving school districts that meet one or more prioritization criteria	$285,000	$375,000
Buses serving other eligible school districts	$190,000	$250,000

Infrastructure Funding

School District Prioritization Status	Type A, C & D EVSBs Infrastructure Funding
Buses serving school districts that meet one or more prioritization criteria	$20,000
Buses serving other eligible school districts	$13,000

Infrastructure Criteria

- Infrastructure limited to fleet's side of the meter for Level 2 charging (EPA Energy Star Rated)
- EPA strongly recommends that all other charging infrastructure under this program be listed by a Nationally Recognized Testing Laboratory (NRTL)

CASE STUDY

Beverly, MA


CASE STUDY
Beverly, MA
Play

The Team

Beverly's Electric Fleet

Planning/ Budgeting

We partnered with Beverly's Transportation Director, Dana Cruikshank, and his team to implement a 2-bus pilot that's now expanding to 30 buses.

Training

We trained Beverly's drivers and mechanics on how to use and maintain the electric vehicles.

The Fleet

Beverly's Electric Fleet

Fleet Build

Beverly selected Thomas Built Saf-T-Liner® C2 Jouley® for their fleet, designed to their specifications.

Fleet Charging

We installed high power, bi-directional charging stations to fully charge buses in 3 hours.

The Depot

Beverly's Electric Fleet

Depot Build

We future-proofed Beverly's depot by installing infrastructure for 24 buses.

Depot Charging

We powered the site in partnership with National Grid, enabling vehicle-to-grid connectivity.

CASE STUDY

Montgomery County, MD

MCPS, Maryland

Highland

The MPCS Electric Fleet

EVSB Site Implementation

Montgomery Country Public Schools partnered with Highland to deploy the largest electric school bus fleet project in North America.

Over a four-year deployment, Highland will provide 326 buses across five depots, as well as V2G services for Pepco and synchronized reserves for PJM.

Citations

1	American Journal of Respiratory and Critical Care Medicine	https://www.atsjournals.org/doi/full/10.1164/rccm.201410-1924OC#.VTVtZK1Vikp
2	American Journal of Respiratory and Critical Care Medicine	https://www.atsjournals.org/doi/10.1164/rccm.201706-1267OC
3	Environmental Epidemiology	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8663889/
4	Community Health	https://projects.iq.harvard.edu/covid-pm,
5	Environmental Justice	https://uspirg.org/reports/usp/electric-buses-clean-transportation-healthier-neighborhoods-and-cleaner-air
6	School Budgets	https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2DXL0_PTE_NUS_DPG&f=W
7	Academic Success	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3351840

