Class 3-7 All-Electric Commercial Vehicles
Vans, Buses, Trucks & Motorcoaches
Intro to Lightning eMotors

COMMERCIAL ZEVs

- Class 3-7 electric vans, trucks & buses already deployed & in production
- Powertrains and EV technology for OEMs and Second Stage Vehicle Manufacturers
- New and Repower both available

ANALYTICS

- Actionable fleet intelligence – driver and route efficiency, HVAC usage etc.
- Unique Big Data on drive cycles

CHARGING

- Complete charging solutions – Level 2 AC and Level 3 DC Fast Charging
- Patented mobile charging solutions

Electrifying Medium Duty Vehicles TODAY
Lightning HQ in Colorado

- 250,000 sq ft facility, on a 1 million sq ft campus with 500,000 sq ft available for future expansions
- All-electric powertrain production, assembly and installation on chassis or full vehicles – new and repower
- 250 employees and growing
Buy America and Buy American Compliant

Federal funding requirements for preferring US-manufactured goods.

This program relates to **federally-funded transit projects**. The requirement is that a minimum of 70% of the components of the product must be produced in the USA. Our analysis for our E-450 conversion shows 83.3% domestic-produced components (by cost).

https://www.transit.dot.gov/buyamerica

This program relates to federal funding of **Airport Improvement Programs**. We meet the two requirements for one of the waiver provisions:

- At least 50% US-produced components
- Final assembly in the US

https://www.faa.gov/airports/alp/buy_american/c
Electric Commercial Vehicles Across Many Use Cases

New and Repower

Certified

Class 3
- Cargo van, passenger shuttle van and ambulance

Class 4
- Shuttle bus, school bus, box/delivery truck, work truck and ambulance

Class 5
- Shuttle bus, box/delivery truck and work truck

Class 6
- Work truck, box/delivery truck

Class 7
- City bus, single and double decker motor coaches

Current ZEV Offerings

KEY CUSTOMERS

KEY PARTNERS
1,800,000 miles
BROAD APPLICABILITY: NEW AND EXISTING COMMERCIAL VEHICLES

**Convert NEW Vehicles**

- Shuttle buses
- Delivery/work trucks
- Short haul trucks

**VEHICLES**

- Lower vehicle TCO than gas or diesel

**ECONOMICS**

- Near OEM chassis plant

**Repower EXISTING Vehicles**

- Shuttle buses
- Transit buses
- Delivery/work trucks

**VEHICLES**

- Up to 75% less expensive than new ZEV

**UPFITTER LOCATION**

- Near customer deployment location
Lightning’s Powertrain System

- A powertrain sled carries the electric motor, the integrated transmission, the inverter and accessories such as power steering pump and AC compressor.

- Powered by the highest quality batteries from global manufacturers such as Proterra and CATL.

- Entire system is thermally managed for maximum safety and efficiency.
Important Efficiency and Safety Features for All Lightning Platforms

Creep
- Emulates ICE vehicles, especially for reversing so driver doesn’t have to judge pressing accelerator pedal when backing up

Hill Hold Assist
- EV vehicles don’t operate with two pedal driving, potential for rollback on startup eliminated

Regenerative Braking
- Operates throughout speed range – maximum benefit increases when used at higher speeds
- Brake lights illuminate
- Lessened automatically at high SOC (state of charge)
- Does not require driver action to activate – it’s automatic by lifting foot off accelerator
- Optimized for passenger comfort

Glass Cockpit
- Our proprietary glass cockpit driver dashboard allows the driver to easily monitor their overall efficiency, state of charge, average kWh per mi, & discharge/charge rate (from regenerative braking)
Lightning Electric Transit T-350HD

- Battery-electric vehicle, 100% zero-emissions
- Up to 10,360lbs GVWR passenger van
- 140- and 170-mile range options
- CARB certified and HVIP approved
- Level II 13.2kW AC and Level III DC fast charge up to 80 kW standard
- Lightning Analytics standard - gives insight into usage and efficiency
- Buy America compliant
- FTA Altoona Testing, projected complete Q2
- A variety of upfit options:
  - ADA Accessible, rear or side loading, up to 9+1 passengers
    - Abilitrax Shift-N-Step
  - Bi-fold bus door option available
Lightning Electric E-450

• Battery-electric vehicle
• 130-mile range
• CARB certified and HVIP approved
• Level II 13.2 kW AC and DC fast charge up to 80 kW standard
• Lightning Analytics standard - gives insight into usage and efficiency
• Buy America compliant
• FTA Altoona Testing, projected complete Q2
• ADA lift options available
• Compatible with most Forest River body configurations
112.6 mi
Distance Driven
27.02
Avg Moving Speed (mph)

54.2 kWh
Energy Used

2.08 mi/kWh
Daily Efficiency
143.08
Expected Range (mi)

90
Average Temperature (F)

3630 ft
Elevation Gain

5.4 hrs
Vehicle On Time
4.0 hrs
Driving Time

Real World Data – Class 3

Speed (mph), SoC (%) – LocalDateTime

Power Used by System

Route Time Distribution
Offering Immediate Operational Savings

**Monthly Fuel + Maintenance Cost**

<table>
<thead>
<tr>
<th>Class 3 Lightning Electric Transit (3,500 miles / month)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$1,488</strong></td>
</tr>
<tr>
<td><strong>$137</strong></td>
</tr>
<tr>
<td><strong>$1,351</strong></td>
</tr>
<tr>
<td><strong>$346</strong></td>
</tr>
<tr>
<td><strong>$75</strong></td>
</tr>
<tr>
<td><strong>$271</strong></td>
</tr>
</tbody>
</table>

77% less

**Cost Comparison**

<table>
<thead>
<tr>
<th>Illustrative LEASE Example</th>
<th>Gasoline</th>
<th>Lightning eMotors With Grants</th>
<th>No Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel and Maintenance Cost per Month</td>
<td>$1,488</td>
<td>$346</td>
<td>$346</td>
</tr>
<tr>
<td>Vehicle Lease</td>
<td>$702</td>
<td>$978</td>
<td>$1,584</td>
</tr>
<tr>
<td>Charger Lease (assuming level 2 11.5kW charger)</td>
<td>--</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>LCFS (Low Carbon Fuel Standard) Credit</td>
<td>--</td>
<td>($615)</td>
<td>($615)</td>
</tr>
<tr>
<td>Total Monthly Cost</td>
<td>$2,060</td>
<td>$738</td>
<td>$1,344</td>
</tr>
<tr>
<td>Monthly Cost Difference to Gasoline</td>
<td></td>
<td></td>
<td>$1,322</td>
</tr>
</tbody>
</table>

13
Lightning Energy – Simplifying the Electrification of Fleets With Integrated Charging Solutions

• One stop shop for electric vehicles, charging solutions, and related software

• Provide peace of mind through an integrated solution with “a single point of contact” if anything isn’t working correctly
Rural Communities – Rethinking Transportation To Better Serve the Community, Environmental Stewardship, Optimize Tax Dollars, and Utilize Funds Available Through Local, State, and Federal
Rural Communities – Consider Current Conditions

Transit Agency

• Geographical Size of Community
• Population Size of Community
• Duty Cycle – Continuous or Downtime Between Routes
• Hours of Operation
• Miles of Routes
• Portfolio of Vehicles – smaller passenger vehicle fleets

Issues Facing Community

• Increased Costs - of health care, fuel, and everything...
• Increased Healthcare transportation needs
Hardware for Strategic Infrastructure Solutions

- Evaluate Duty Cycle – 8-10 hours/day, Continuous, or Downtime Between Routes
- Redesign Routes
  - On Demand
  - Porterville

- DC Charge - Opportunity Charge
- AC Charge – Fixed Hours of Operation

- Portfolio of Shuttle or Vans
  - Single Vehicle – expand fleet to add a vehicle utilizing all funding mechanisms
  - Evaluate size of shuttles/vans, move to a larger or smaller size vehicle to adjust routes
How do I do this?

• Hours of Operation – Infrastructure Cost Planning and Funding
• Portfolio of Vehicles – Portfolio of products in market approved by Altoona and FTA funded to support rural communities.
  – Forest River – Vans and Cutaways Passenger and Paratransit that support all Electric

• Conventional FTA Funds
• Lo-No 2023
• Bus and Bus Fixtures 2023
• Local Air Quality Management Funding
• HVIP
How do I do this?

- Information Technology for Telematics and Analytics
  - Helps fleet operators track vehicles and find the closest charging station
- APPS - Examples
  - Plug Share
  - ChargePoint