



busworld[®] academy

NORTH AMERICA | JAN. 13-14, 2020

POWERED BY





Gary Horvat

NAVISTAR, VICE PRESIDENT eMOBILITY



IC Bus – Driving Choice



THE POWER OF CHOICE

Our goal is to help, and provide, the best choice!

Every IC Bus Except Electric comes standard with an Allison Transmission

DIESEL



- Reliable and efficient
- Most powerful
- Most durable
- Best fuel economy
- Maintenance experience (familiar)
- Access to fuel

Gasoline



- Lowest acquisition cost
- Limited aftertreatment
- Maintenance technician availability
- Ideal for stop and go & short routes
- Cold weather benefits
- Access to fuel

Propane



- Tax credit and grant availability
- Smooth, quiet, reliable power
- Most stable fuel price
- Clean burning
- Limited aftertreatment
- Cold weather benefits

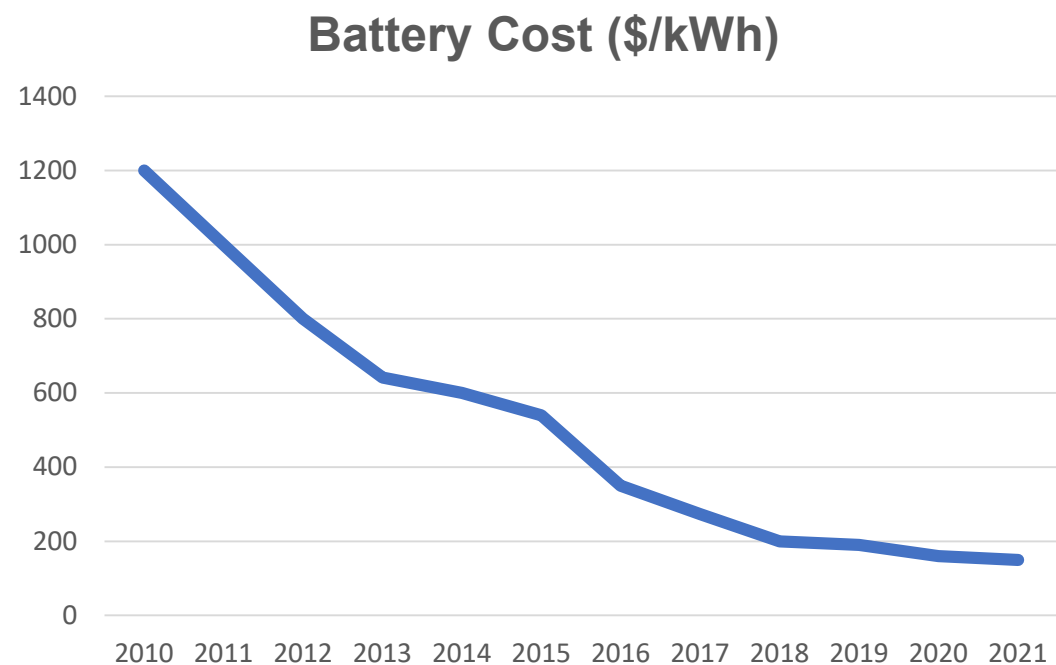
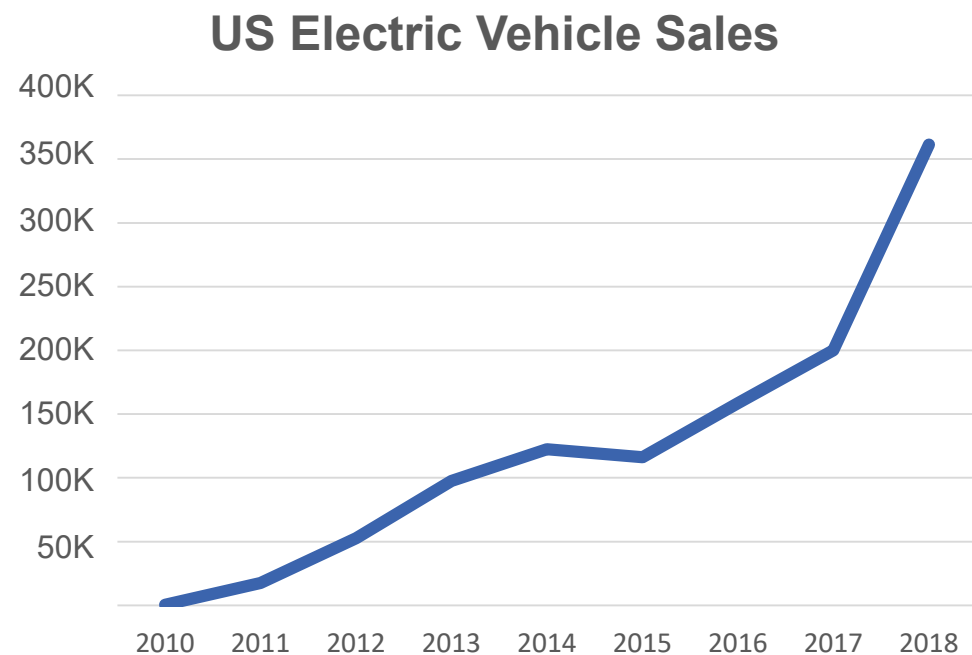
Electric (Concept)



- Tax credit and grant availability
- Zero emissions
- Lowest maintenance costs
- Unique power/acceleration/ off the line
- Estimated launch: 2020



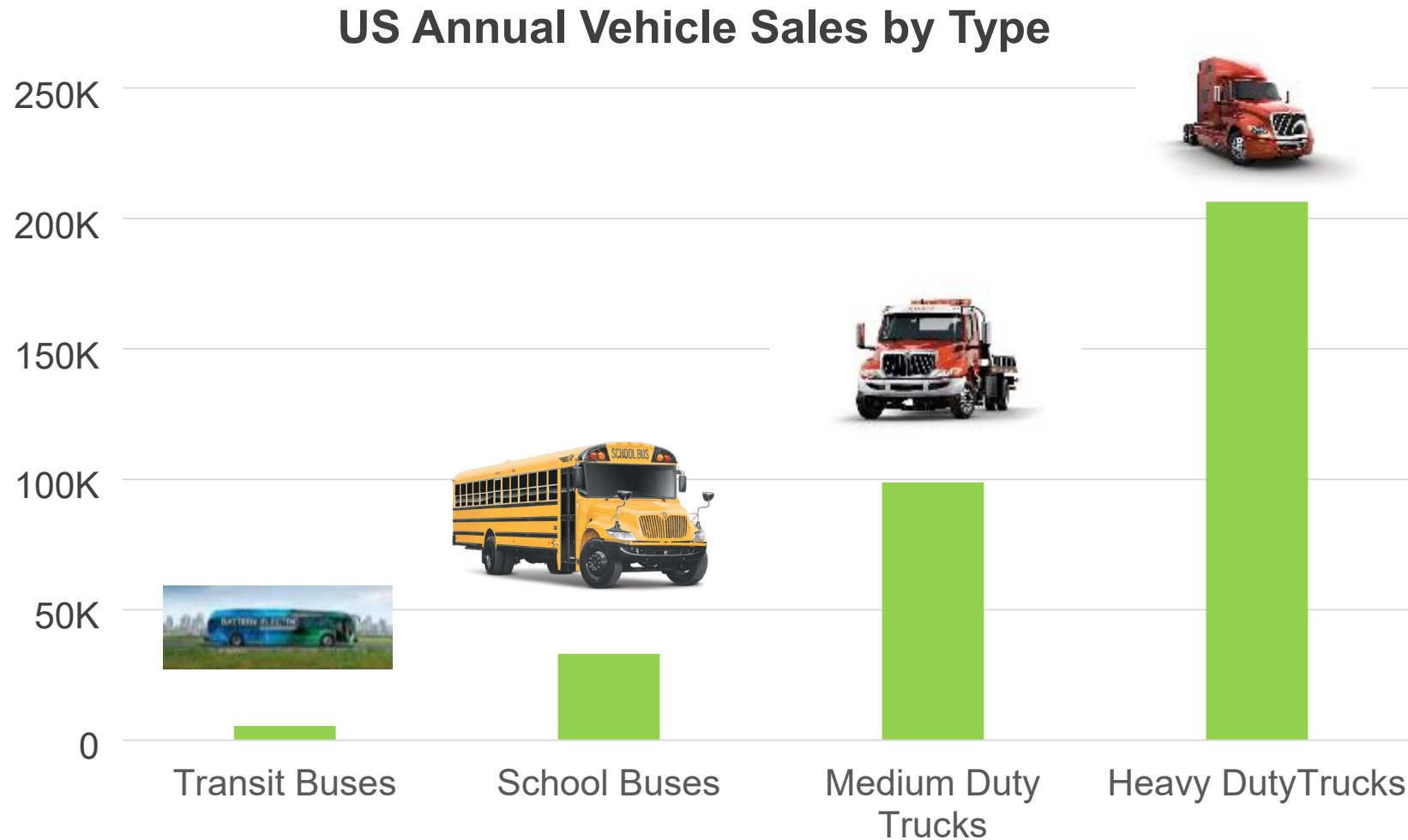
ELECTRIC VEHICLE ECONOMICS CONTINUE TO IMPROVE



As Electric Vehicle Volume increases, Battery Costs continue to Decrease



Market for Electric Commercial Vehicles



Electric Vehicle Adoption is already happening with US Transit Buses, but the larger market for electrification is with other Commercial Vehicles

Why School Bus is a Good Fit

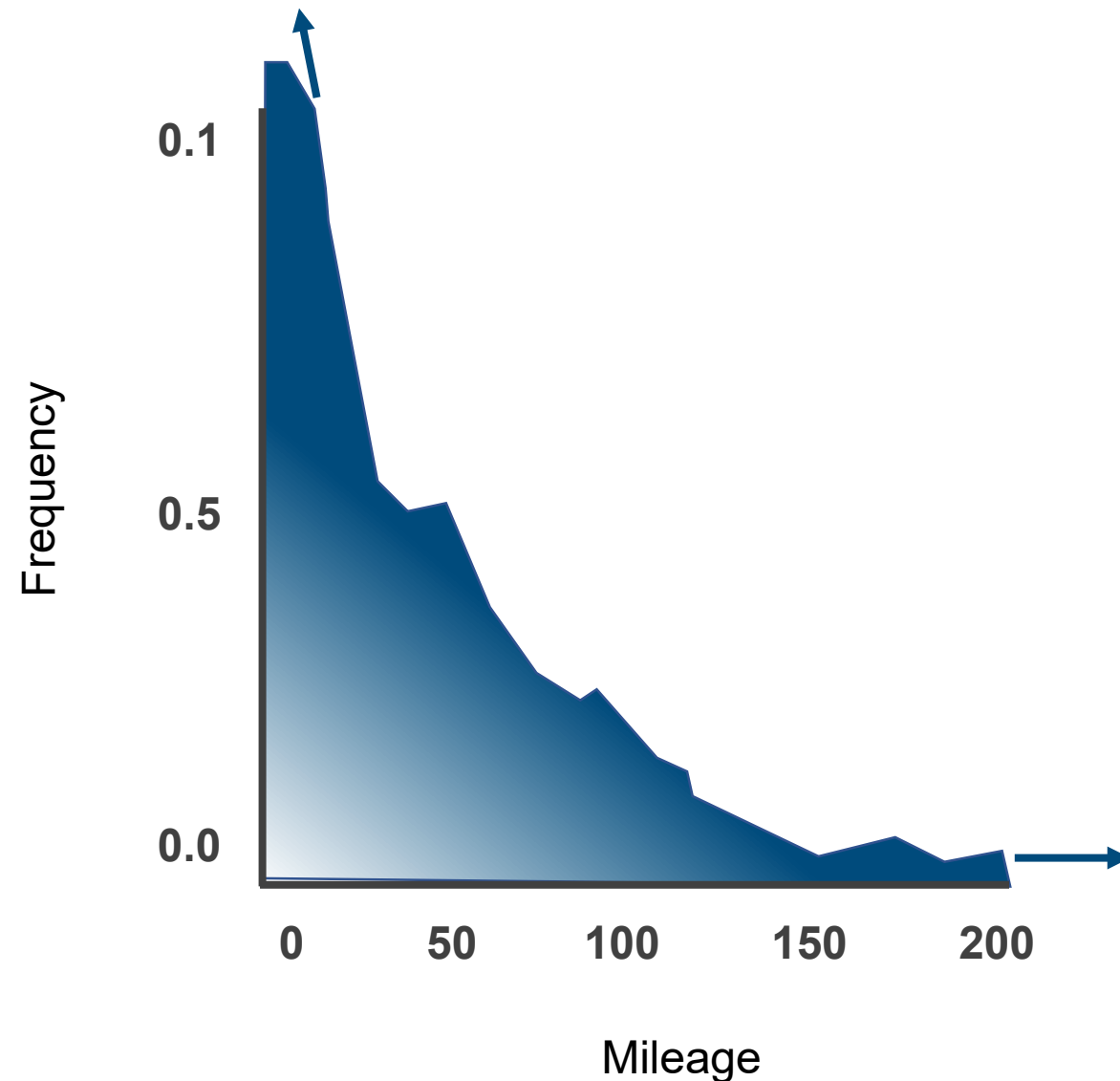
- Low average daily mileage : 60 to 70 miles
- Known, fixed route each day
- Return back to same location each day
- Possible to charge mid-day
- Start & Stop operation
- High availability of grant funding





DAILY ROUTE DRIVEN FOR SCHOOL BUS

Navistar School Bus > 26,000 lb
Daily Mileage Distribution





2018 chargE Roadshow

Customer Categories



Early Adopters

- Truly wants to be green
- Interested in latest technology
- Considering or already has alternative fuel buses

Volunteered Owner

- Forced to take technology due to funding/school board
- Risk averse to new technology

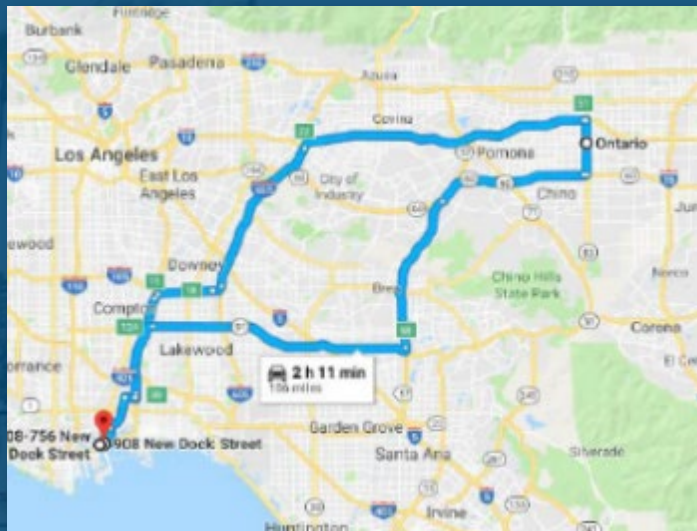
Laggards

- Wants others to test the technology first
- Infrastructure scares them
- Concerned about initial acquisition cost

Navistar's Path to Electric Success



Consulting



**Route
Simulation**



**Grant
Opportunities**



**Battery
Options**



Constructing

Building Trucks & Buses
at Navistar facilities





Charging

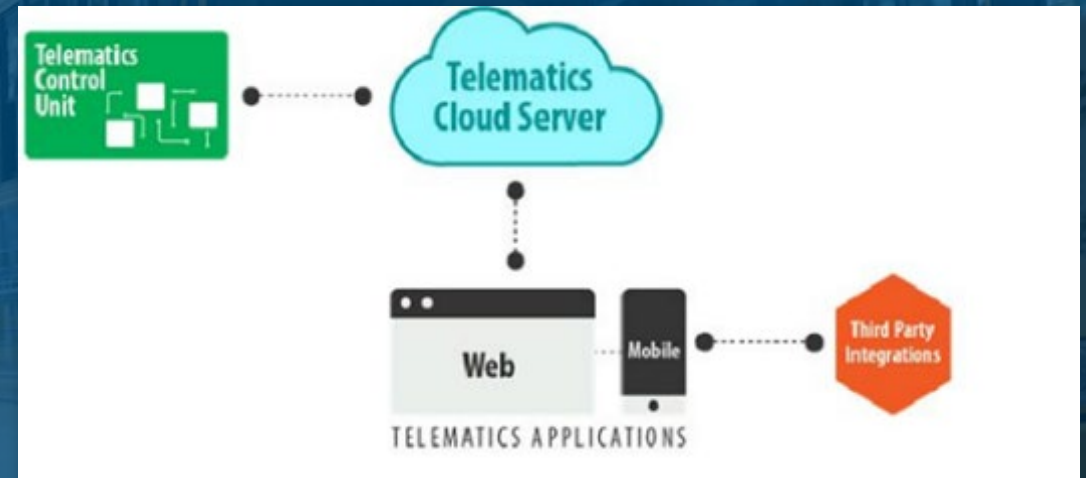
Recommend and Assist in determining
Charging Hardware Infrastructure





Connecting

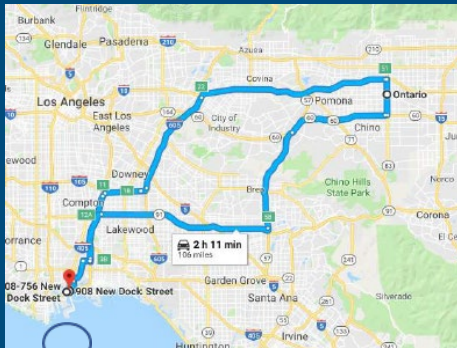
Connect to vehicles with Telematics to monitor vehicle and battery during operation plus connect with Dealer network



NAVISTAR'S APPROACH TO ELECTRIFICATION IMPLEMENTATION 4C'S

Work with Customer Through Entire EV Procurement and Implementation

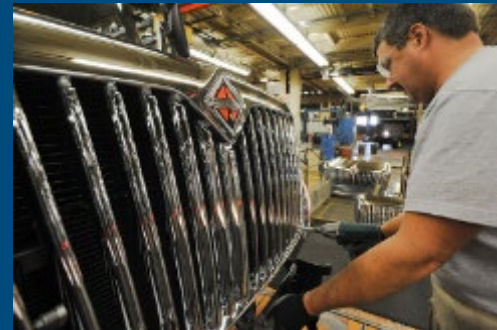
CONSULTING



Route Simulation to determine EV requirements and efficiencies

Share EV Funding Opportunities

CONSTRUCTING



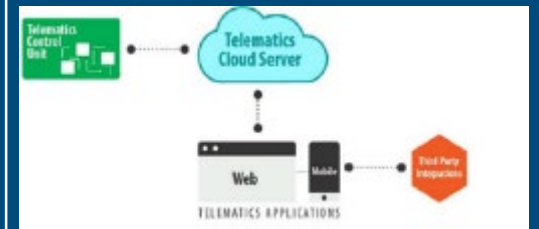
Configuring and Building Trucks and Buses in Navistar Facilities

CHARGING



Provide Requirements of charger, infrastructure and assist in charger installation

CONNECTING



Monitor and communicate EV vehicle performance with telematics and assist through dealer network