WEBINAR REMINDERS

- Please **Mute** your microphone unless speaking.
- You can place questions in the **Chat** which will be answered in the chat and during the Question/Answer Session at the end.
- You can use the **"Raise Your Hand"** feature to ask questions or make a comment during the Question/Answer portion of the webinar.
- This meeting will be **Recorded**.

North Central Texas Council of Governments

Regional Transportation Council

SMARTE
Saving Money and Reducing Truck Emissions

Saving Money and Reducing Truck Emissions Webinar Series

Right Sizing for Procurement/Deployment Needs

Date: Wednesday, March 18, 2026

Time: 1:00 PM – 2:00 PM Central Time

Hosted by the North Central Texas Council of Governments (NCTCOG)

Contact: Trey Pope, tpope@nctcog.org

Presenters:

Rick Mihelic

North American Council on Freight Efficiency

Ryan Bankerd

UPS

OVERVIEW


Image provided by Getty

Welcome, Introduction
Presenter: Trey Pope, Transportation Air Quality Planner, NCTCOG

Vehicle and Infrastructure Learnings
Presenter: Rick Mihelic, Director of Emerging Technologies, North American Council on Freight Efficiency

Optimizing Heavy-Duty Fleets: UPS Insights on Cost, Infrastructure, and Sustainability
Presenter: Ryan Bankerd, Global Director of Sustainability, UPS

Discussion

Local Updates and Close

Saving Money and Reducing Trucking Emissions Program

GOALS

Promote emissions reduction and cost saving strategies within the trucking industry

INITIATIVES

Build relationships within the trucking industry

Share information about emission reduction strategies

Connect SmartWay verified technology to trucking owner/operators and fleet managers

SMARTE

Saving Money and Reducing Truck Emissions

SMARTE
Saving Money and Reducing Truck Emissions
North Central Texas Council of Governments

SMARTE Webinar Series: Right-Sizing for Procurement/Deployment Needs

NACFE
NORTH AMERICAN COUNCIL FOR FREIGHT EFFICIENCY

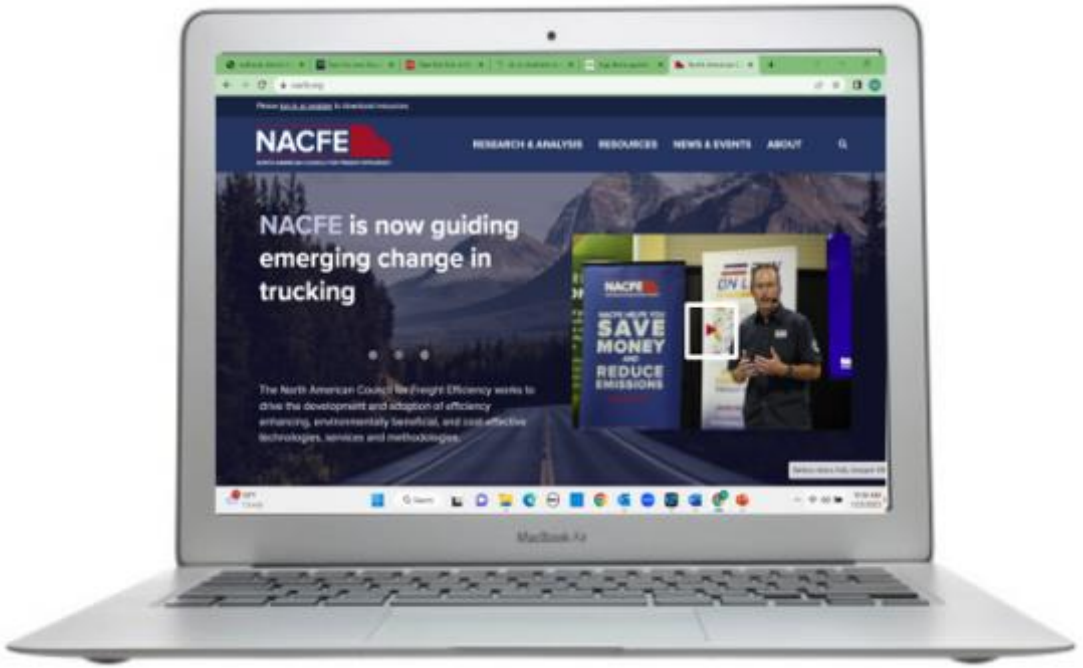
Vehicle and Infrastructure Learnings

Rick Mihelic

March 18, 2026

RUN ON LESS MESSY MIDDLE

North American Council for Freight Efficiency



- Unbiased, fuel agnostic, non-profit
- Mission to double freight efficiency
- All stakeholders
- Scale available technologies, guide emerging change and Run on Less demonstrations.

www.NACFE.org

www.RunonLess.com

NACFE
NORTH AMERICAN COUNCIL FOR FREIGHT EFFICIENCY

Run on Less by NACFE

2017

RUN ON LESS BY NACFE

Long Haul

7 Fleets

10.1 MPG

2019

RUN ON LESS REGIONAL

Regional Haul

10 Fleets

8.3 MPG

2021

RUN ON LESS ELECTRIC

All BEVs

13 Fleets

EV Truck Pilots

2023

RUN ON LESS ELECTRIC DEPOT

BEV Depots

10 Depots

Infrastructure

2025

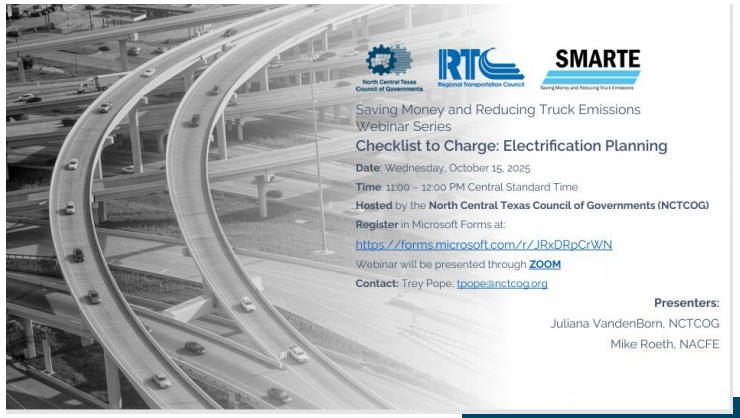
RUN ON LESS MESSY MIDDLE

Long Distance

Many Alternative Fuels

Key Resources

SMARTE Webinar 10/15/2025
Checklist to Charge: Electrification Planning

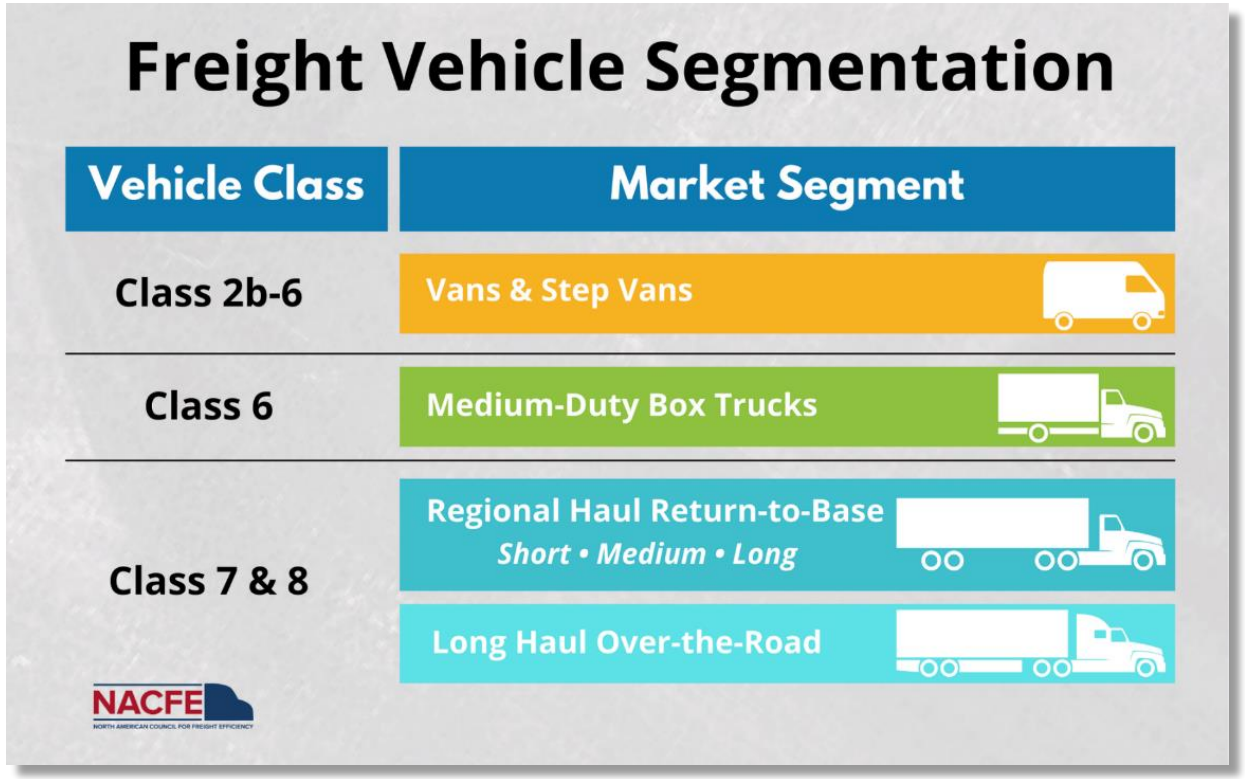


https://www.nctcog.org/getContentAsset/a16f037f-ca93-48f9-9f52-67e84b92bf5a/dfc3d011-8f63-43f6-9ed8-4b444333a1d0/SMARTE-Webinar-Series-Checklist-to-Charge.pdf

NACFE's New Report
March 2026

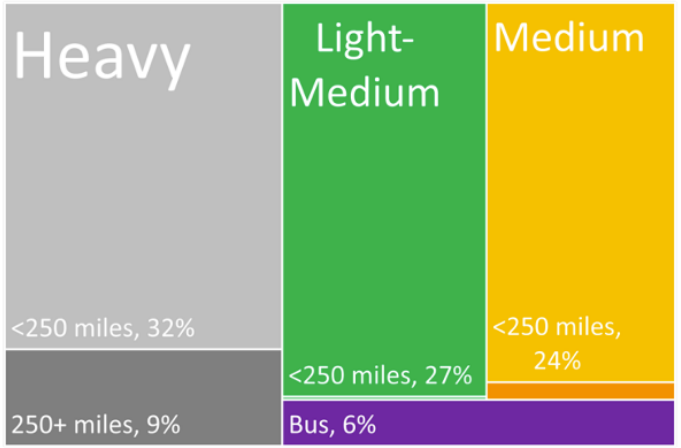
https://nacfe.org/research/run-on-less/

Commercial Vehicle Market Segmentation

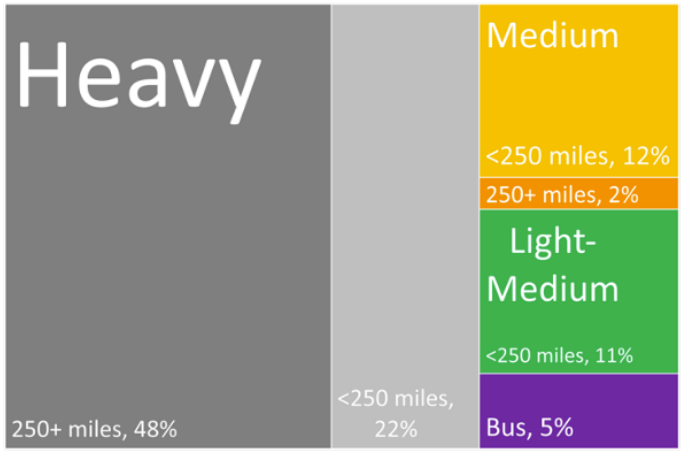


Heavy trucks are ~40% of total vehicle stock but are responsible for about 70% of emissions

Market Segmented by Vehicle Class



Market Segmented by Emissions



2019 Data: https://docs.nrel.gov/docs/fy22osti/82081.pdf

Run On Less Overview

RUN ON LESS MESSY MIDDLE by NACFE

Demonstration Scope

September 2025 • Production Vehicles • 10-Second Telemetry Intervals

13	14	4	18	73K+	2.2 M
Fleets	Trucks	Powertrains	Days	Miles	Data Points

Diesel/RD	CNG/RNG	BEV	Hydrogen
4	3	5	2

Fleet Distribution by Powertrain Technology

https://results-2025.runonless.com/

Classifying Run On Less HD Trucks

Class 8 Tractors Across Duty Cycles

Archetype 1: Long-Haul Over the Road

Share: 40% to 45% • Tractors: 680K to 765K

Run on Less Tractors: Albert Transport, MVT, JoyRide

Archetype 2: Long Return to Base / Regional Linehaul

Estimated Share: 20% to 25% • Estimated Tractors: 340K to 425K

Run on Less Tractors: Schneider, UPS, Saia T2

Archetype 3: Regional Return to Base

Estimated Share: 20% to 25% • Estimated Tractors: 340K to 425K

Run on Less Tractors: Wegmans, Frito-Lay, Kleysen, Nevoya, Pilot, Penske

Archetype 4-5: Drayage / Pickup & Delivery

Estimated Share: 10% to 15% • Estimated Tractors: 170K to 255K

Run on Less Tractors: 4Gen, Saia T1

RUN ON LESS MESSY MIDDLE by NACFE

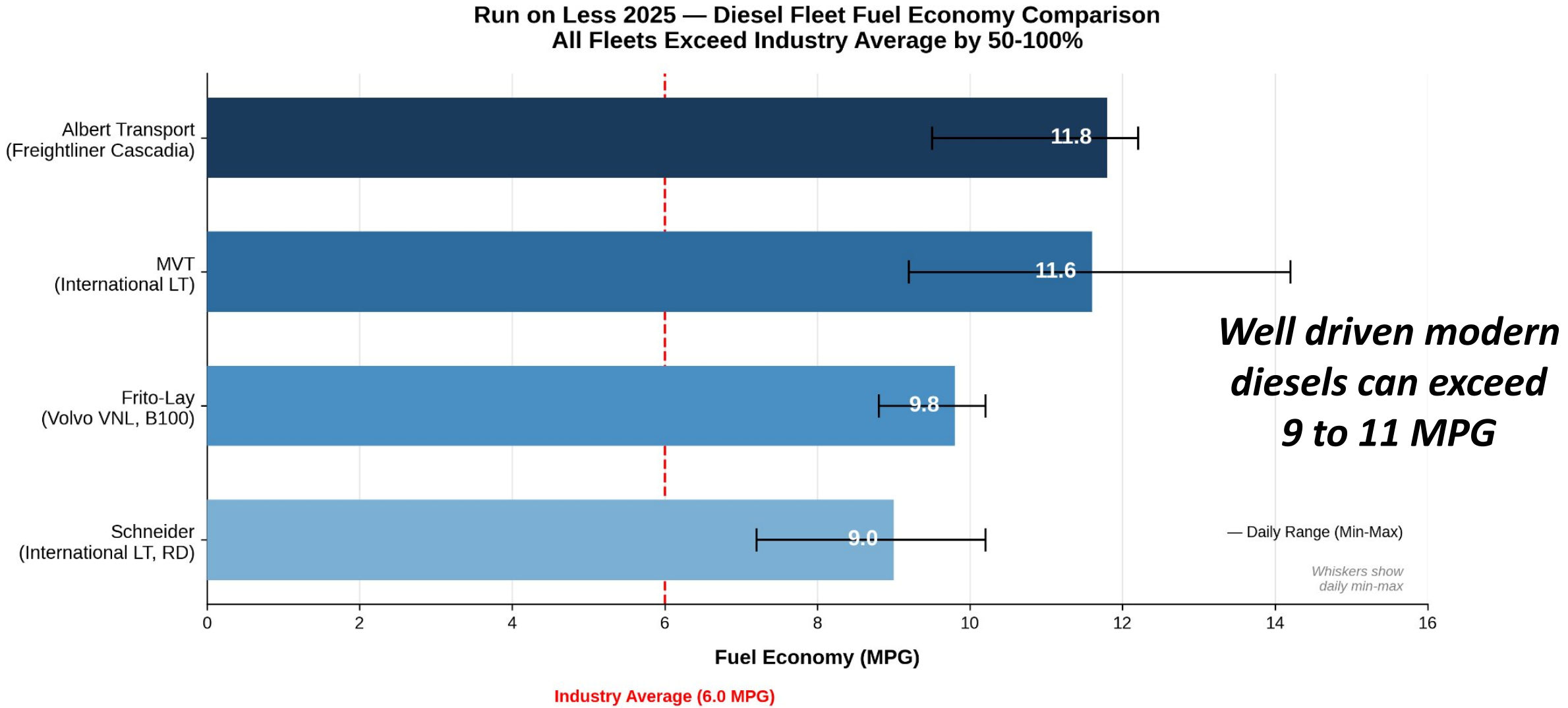
Results

Aggregated Performance Data for All Four Powertrains

Technolgy	Fleets	Total Miles	Active Days	Avg Mi/Day	Max Daily Miles	Primary Metric
Diesel/RD/Biodiesel	4	32,225	62	518	1,175	9.0 to 11.8 MPG
CNG/RNG	3	20,737	37	557	951	4.5 to 6.7 mi/DGE
BEV	5	15,500	68	228	875	1.5 to 2.0 kWh/mi
Hydrogen FCEV	2	5,900	27	218	427	7.5 to .8 mi/kg H_2

Note: The BEV column includes 4Gen, Nevoya, SAIA (2 trucks), and JoyRide deployments. Schneider diesel (renewable diesel) is counted in the Diesel/RD category. CNG/RNG efficiency (mi/DGE) should not be compared directly to diesel MPG due to different duty cycles. All three CNG fleets operated at 100,000 to 140,000 lbs. with GCW of doubles or triples, versus 80,000 lbs. single-trailer operations for diesel fleets. When normalized for payload, CNG freight efficiency is competitive with diesel.

Diesel Results



Well driven modern diesels can exceed 9 to 11 MPG

BEV Results

Comparison of Operating Characteristics
Battery Electric Fleets

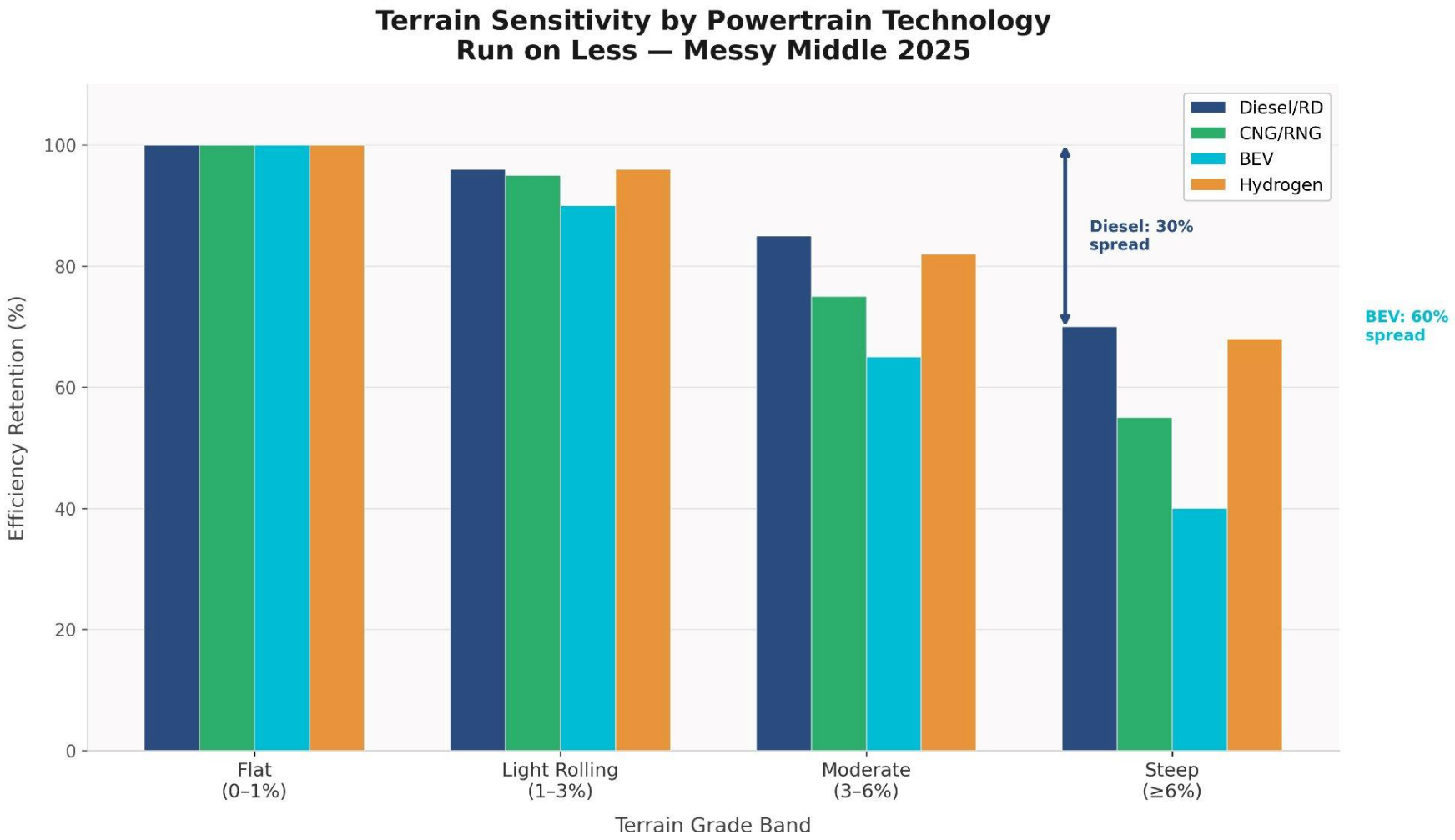
Fleet	Vehicle	Battery (approx)	Total Miles	Avg mi/day	Max Daily Miles	Efficiency mi/kWh	Regen Share (approx)	Terrain Profile	Primary Duty Cycle
4Gen	Volvo VNR Electric	565 kWh	2,612	≈201	388	≈0.530	≈11% to 20%	Inland Empire; ≈80% of miles <3% grade	Regional drayage and distribution, mixed congestion
JoyRide	Windrose sleeper	705 kWh	5,725	≈409	875	≈0.545	≈15%	TX → CA via Rockies, Sierra, Grapevine; ≈96% of miles <3% grade (interstate design)	Long-haul regional and corridor operations
Nevoya	Freightliner eCascadia	438 kWh	2,247	≈173	348	≈0.600	≈8.9%	Central Valley; ≈90% of miles <3% grade	Regional distribution and DC-to-DC transfers, evening-heavy
Saia 1	Tesla Semi	~800 to 900 kWh	1,025	≈79	130	≈0.569	≈19.7%	Bay Area / Central Valley; ≈90% <1% grade	LTL multi-stop regional distribution, evening-heavy
Saia 2	Tesla Semi	~800 to 900 kWh	4,841	≈372	660	≈0.624	≈13% to 15%	NorCal long-haul; ≈81% of miles <3% grade	Terminal-to-terminal LTL long-haul, overnight/early AM

Comparisons in High Mileage Line Haul

High-Productivity Linehaul Comparison

Fleet	Technology	Daily Avg	Max Day	Key Enabler
MVT	Diesel	770 miles	1,176 miles	Ubiquitous fueling, driver optimization
UPS	CNG	694 miles	699 miles	Fixed lanes, positioned infrastructure
Wegmans	CNG	541 miles	930 miles	Adjacent fast-fill, regional RTB
Albert Transport	Diesel	464 miles	828 miles	Flat terrain, overnight scheduling
JoyRide	BEV	409 miles	875 miles	Strategic charging, flat corridors
Saia 2	BEV	361 miles	585 miles	Corridor charging, highway-focused

Uphill Driving Differences



Efficiency retention shows performance relative to flat terrain (100% = best efficiency on 0–1% grades). BEV shows 50–70% efficiency swings; Diesel shows ~30% variation across extreme terrain contrast.

Note in downhill driving BEV regenerative braking recovers much of that energy where other modes do not

Route Consistency

Route Consistency Comparison of Messy Middle Participants

Fleet	Powertrain	Days	Avg mi/day	CV	Min-Max	Classification
4Gen	BEV	13	189	55.5%	41 to 429 miles	Variable
Albert Transport	Diesel	16	464	47.6%	75 to 828 miles	Fixed-Lane*
Frito-Lay	Diesel	13	409	35.9%	20 to 573 miles	Semi-Fixed
JoyRide	BEV	14	409	47.5%	144 to 875 miles	Variable
Kleysen	CNG/RNG	14	438	37.8%	22 to 576 miles	Semi-Fixed
MVT	Diesel	18	770	35.7%	149 to 1,176 miles	Semi-Fixed
Nevoya	BEV	13	173	61.6%	13 to 348 miles	Variable
Penske	Hydrogen	15	140	1.7%	136 to 145 miles	Fixed-Lane
Pilot	Hydrogen	15	271	50.1%	56 to 484 miles	Variable
Saia 1	BEV	13	79	35.4%	47 to 130 miles	Semi-Fixed
Saia 2	BEV	13	361	60.5%	71 to 585 miles	Fixed-Lane**
Schneider	Diesel	13	326	43.0%	39 to 568 miles	Variable
UPS	CNG/RNG	13	694	0.8%	676 to 699 miles	Fixed-Lane
Wegmans	CNG/RNG	10	541	46.7%	132 to 930 miles	Variable

Note: CV = Coefficient of Variation. Fixed Lane: CV <10%; Semi-Fixed: CV 10% to 40%; Variable: CV >40%.

**Albert operates three consistent routes year-round; high CV reflects route-length differences rather than operational variability.*

***Saia 2 linehaul shows CV of 10.7% on full-operation days (457 to 585 mi); overall CV inflated by partial days and downtime.*

Daily routing can complicate comparisons

Higher — Disparate routing daily

Route consistency introduces the metric "Coefficient of Variation" - CV

Lower — Same route daily

Infrastructure Availability and Energy Costs

Infrastructure & Operational Characteristics by Technology

Characteristic	Diesel	CNG/RNG	BEV	Hydrogen
Station Density	~150,000+	~1,000	~6,500 DCFC*	~60 Heavy-Duty
Refuel/Charge Time	10 to 15 minutes	5 to 15 minutes	30 to 90 minutes	Not measured†
Range Buffer Needed	~0%	10% to 15%	25% to 40%	30% to 50%
Avg Daily Miles (Run)	492 miles	558 miles	239 miles	206 miles
Range Utilization	63%	78%	50%	76%
Cost Position	Mid-range	Lower fuel cost‡	Variable§	Highest current
Cost Stability**	Moderate to High	High	Moderate	Low to Moderate

**Station density data from DOE Alternative Fuels Data Center. Most DC fast chargers are not truck-capable. HD = heavy-duty capable stations.*

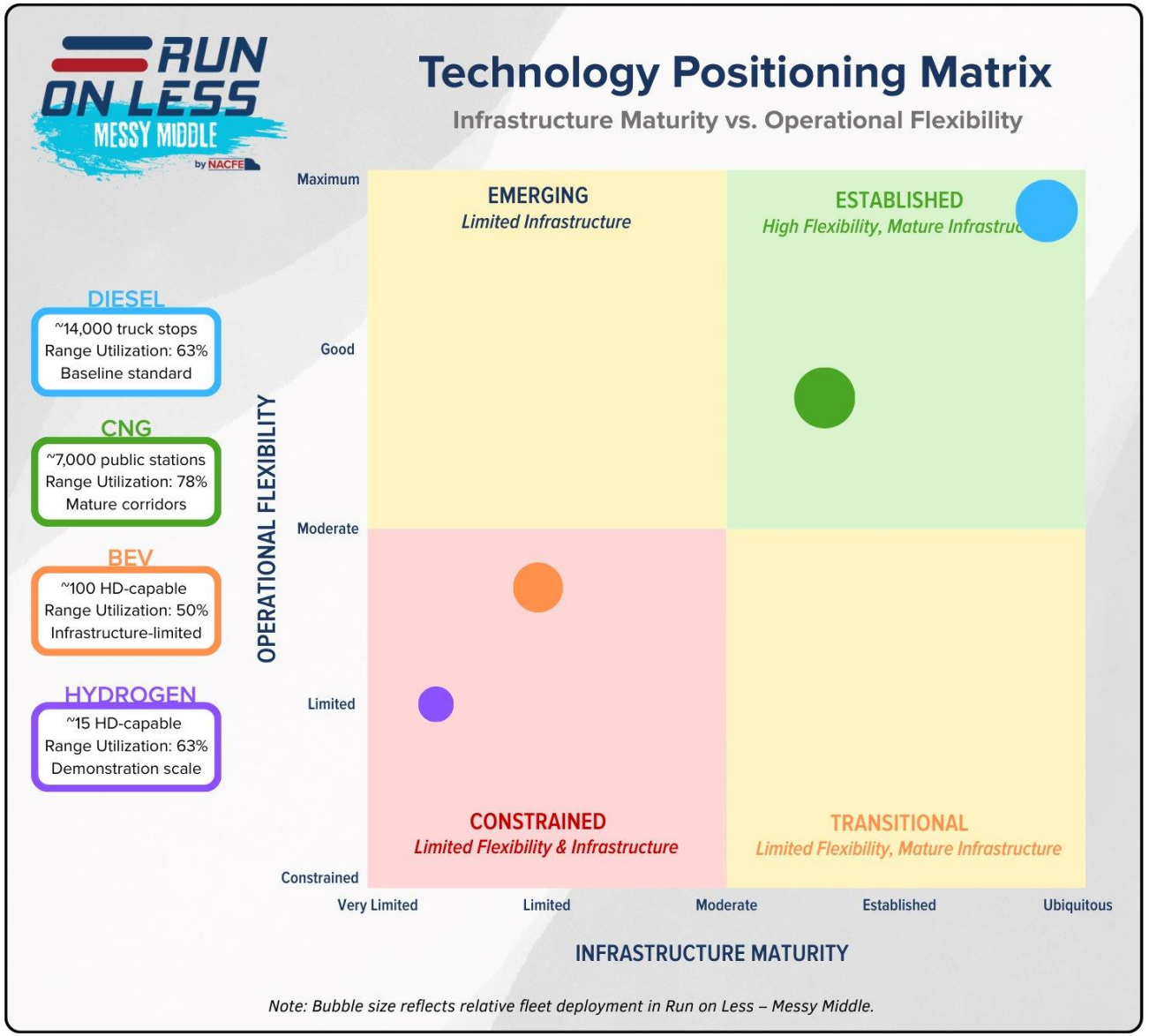
***Cost stability reflects general industry assessment of price volatility and contractual predictability; not measured during Run.*

†Hydrogen fueling time not measured during Run; manufacturer specifications typically cite 10 to 15 minutes.

‡CNG fuel cost per mile competitive with diesel; vehicle acquisition costs carry significant premium.

§BEV energy cost highly dependent on utility rate structure, time-of-use pricing, and demand charges; ranges from lowest-cost to above-diesel depending on charging circumstances.

Current Technology Positioning



Key Findings

Deployment Readiness Assessment

Five Dimensions to Evaluate Before Technology Commitment

ROUTE & CORRIDOR

- Terrain profile (grades >3%?)
- Daily mileage requirements
- Route predictability
- Speed requirements
- Infrastucture positioning

INFRASTRUCTURE

- Depot electrical capacity
- En-route station access
- Backup fueling options
- Buildout timeline & cost

OPERATIONAL READINESS

- Depot electrical capacity
- En-route station access
- Backup fueling options
- Buildout timeline & cost

ECONOMIC

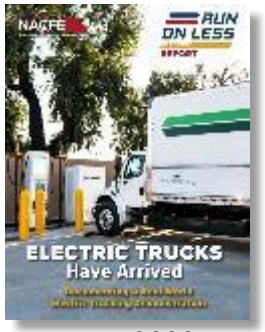
- Capital requirements
- Incentive availablity
- Energy cost assumptions
- Utilization impact

SUSTAINABILITY

- Organizational goals
- Customer requirements
- Regulatory environment
- Carbon intensity by pathway
- Reporting requirements

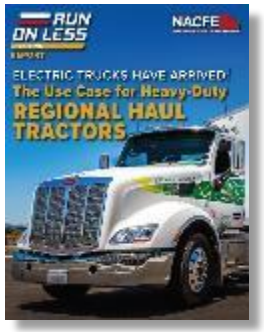
Note: Comprehensive TCO analysis will be addressed in a separate NACFE report.

Key NACFE Reports on ZEV Trucks



Jan 2022
Review Of Complete Demonstration:
Electric Trucks Have Arrived

Jun 2022
The Use Case For
Medium Duty Box Trucks

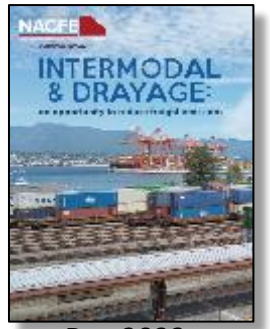


May 2022
The Use Case For
Regional Haul Tractors

Feb 2023
The Messy Middle: A Time For Action

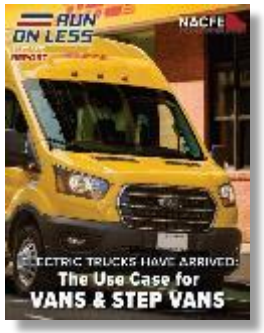
Dec 2020
Making Sense of Heavy Duty Hydrogen Fuel Cell Tractors

Apr 2023
Hydrogen Trucks: Long-Hauls Future?



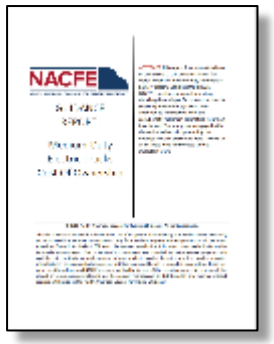
Dec 2023
Intermodal & Drayage

Mar 2022
The Use Case For
Terminal Tractors

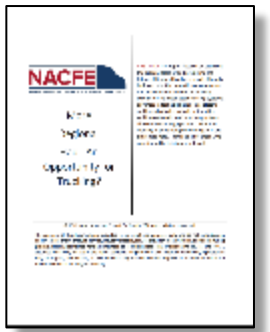


Apr 2022
The Use Case For
Vans & Step Vans

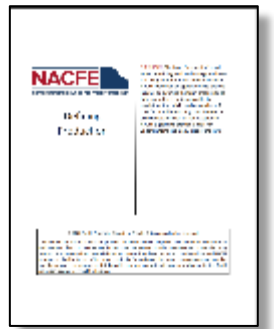
May 2018
Electric Trucks: Where They Make Sense



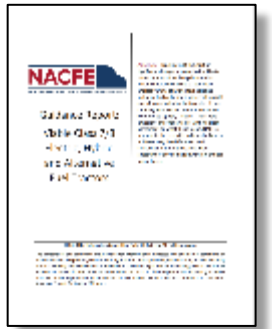
Oct 2018
Medium Duty Electric Trucks TCO



Apr 2019
More Regional Haul: An Opportunity for Trucking?



Jan 2020
Defining Production



Dec 2019
Viable Class 7/8 Electric, Hybrid and Alternative Fuel Tractors

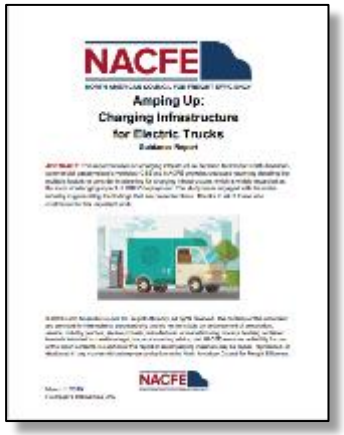
Key NACFE Reports on Infrastructure

Electric Truck Depots Are Evolving:
How 10 Fleets Grew Their BEV Populations

Issued May 7, 2024

Scaling BEVs In The Real World

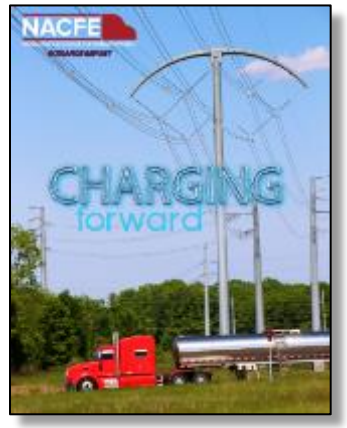
Issued July 9, 2024



[Amping Up]

Charting the Course for Early Truck Electrification

High Potential Regions for Electric Truck Deployments



Infrastructure Report

Contact Information

Rick Mihelic
Director Emerging Technologies
North American Council for Freight Efficiency
www.NACFE.org
rick.mihelic@nacfe.org

THANK YOU

Optimizing Heavy-Duty Fleets: UPS Insights on Cost, Infrastructure, and Sustainability

Ryan Bankerd | UPS | March 18, 2026

UPS has been leading

sustainable fleet

innovations for decades

Agenda

Fleet Decarbonization Strategy

Discuss strategies and operational impacts of transitioning to low-emission vehicle fleets for sustainability.

Right-Sizing Fleet Deployments

Explore optimal sizing for medium- and heavy-duty fleets to enhance efficiency and reduce emissions.

Infrastructure and Technology Readiness

Review necessary infrastructure and emerging technologies for successful fleet upgrades and operations.

Texas Grant Alignment

Align fleet planning and decisions with Texas grant priorities for funding and compliance.

First Electric UPS Delivery Vehicles, Los Angeles California, 1936

We Do

We are the world's largest package delivery company and a premier provider of global supply chain solutions

U.S. Domestic & International Small Package

Full spectrum of U.S. domestic guaranteed ground and air package transportation services

International Package

A wide selection of guaranteed day and time-definite international shipping services

150,000
Retail Entry Points

Package Delivery Fleet (package cars)
88,000

237
Aircraft

UPS Global Logistics Network

Supply Chain & Freight

Logistics & Distribution

Solutions to manage the flow of goods from receiving to storage to processing to shipping

17,800
Tractor Fleet

UPS Capital

Insurance, financing, and payment services

UPS Freight

Freight Forwarding

A portfolio of global air and ocean freight services

Customs Brokerage

Global Alternative Fuel & Advanced Technology Vehicles

Total Vehicles (U.S. & International): 19,000+

United States Fleet:

- Compressed Natural Gas Vehicles
- Liquid Natural Gas Vehicles
- Hybrid Electric Vehicles
- Electric Vehicles
- Propane Vehicles
- Electric Bikes

International Small Package Fleet:

- Propane Vehicles
- Compressed Natural Gas Vehicles
- Electric Vehicles
- Electric Bikes
- Ethanol Vehicles
- Liquid Natural Gas
- Hybrid Electric Vehicles

UPS Rolling Laboratory At a Glance

Alternative Fuel and Advanced Technology Fleet

OPERATING SITUATION

Suburban

ALTERNATIVE FUEL: **CNG & HYBRID (ELECTRIC & HYDRAULIC)**

Range: **100 MILES AVERAGE**

We're locating natural gas compressors, storage tanks, and fueling stations at large, suburban facilities to support CNG package cars.

OPERATING SITUATION

Regional (UPS HUB TO UPS HUB)

ALTERNATIVE FUEL: **LNG, CNG & BIOMETHANE (RNG)**

Range: **400-600 MILES AVERAGE LONG-HAUL**

Our LNG investments include refueling infrastructure corridors in the U.S. to service our growing natural gas fleet.

OPERATING SITUATION

City Center

ALTERNATIVE FUEL: **ELECTRIC & ETHANOL**

Range: **LESS THAN 60 MILES AVERAGE**

Electric vehicles help to reduce tailpipe emissions in urban areas, while ethanol is a viable fuel where local markets support production, such as Brazil.

OPERATING SITUATION

Rural

ALTERNATIVE FUEL: **PROPANE**

Range: **100+ MILES**

Propane provides a cost-effective fueling solution in locations with package cars that drive 100+ miles per day.

The Impact of Right-Sizing

Controlling Total Cost of Ownership

Right-sizing ensures assets match actual needs, preventing overspending and minimizing unnecessary costs for organizations.

Reducing Emissions

Aligning vehicles to real-world duty cycles helps minimize emissions, supporting sustainability goals and regulatory compliance.

Enhancing Reliability and Planning

Fit-for-purpose deployment improves operational reliability and demonstrates disciplined planning, making fleets more competitive for grants.

Three Pillars of Right-Sizing

Operational Demands

Analyze routes, payloads, and vehicle utilization to match fleet size and specifications with business needs.

Infrastructure Availability

Ensure fueling, charging, and site access are available and practical from the start for all fleet vehicles.

Vehicle Technology & Specifications

Select proven, serviceable vehicle technologies that meet regulatory requirements to optimize fleet performance.

Right-Sizing for Texas Grants

Operational Validation

Validate routes, duty cycles, and utilization to confirm vehicles match real-world Texas conditions for optimal performance. Fleet operators, Maintenance teams and Procurement should be providing input.

Site Readiness Assessment

Ensure deployment sites are prepared with charging, fueling, and power access for vehicle integration and efficient operation. Utilities and infrastructure providers need to be partnered with.

Technology Compliance

Select technologies proven to meet Texas regulatory, safety, and air-quality standards. Prevents stranded assets. Grant providers are a great resource.

Right-Sizing Accelerates Results

Aligning Costs and Operations

Right-sizing ensures fleet resources are used efficiently, reducing operational costs while improving performance and sustainability.

Strategic Route and Readiness Analysis

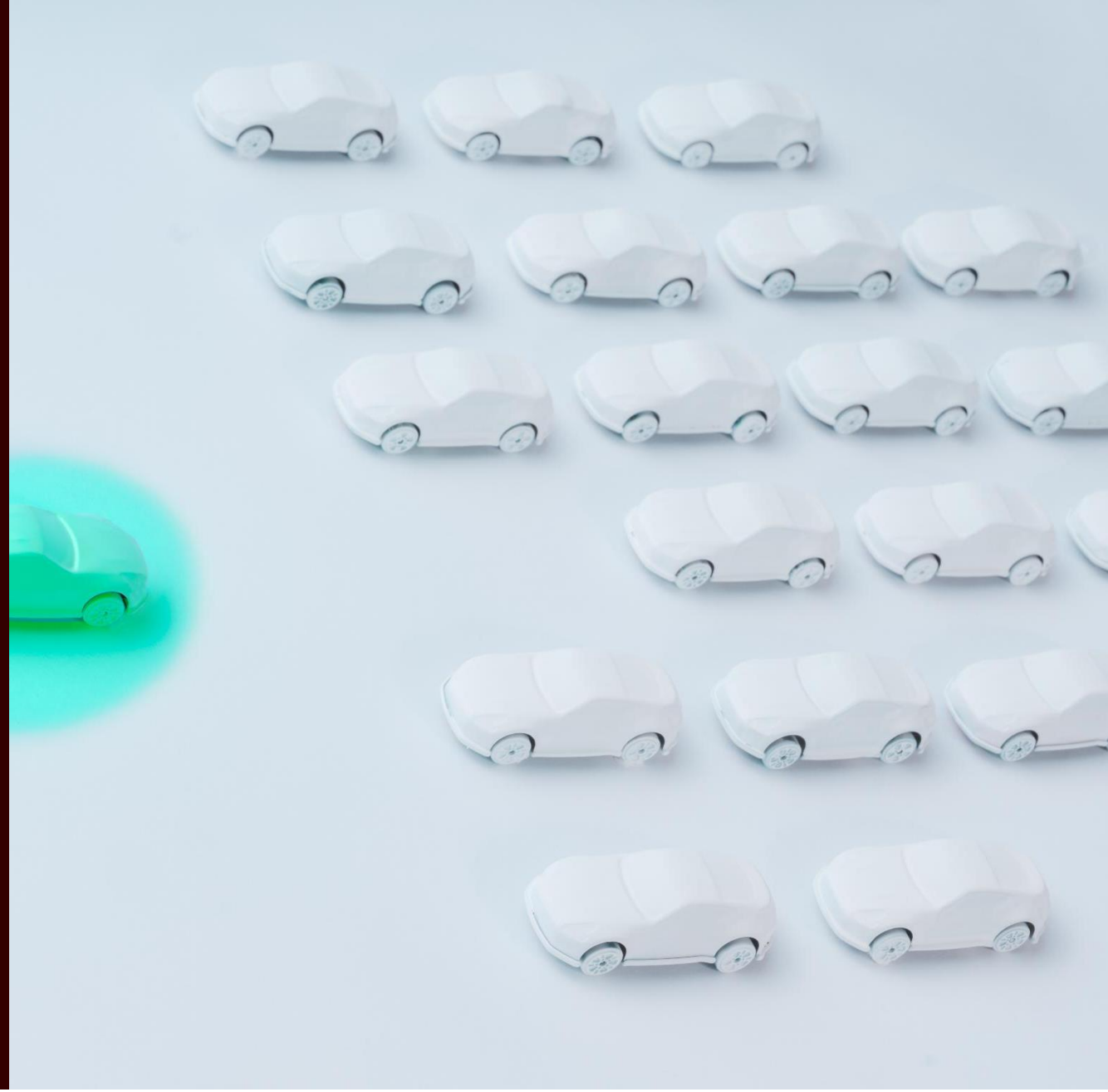
Analyzing real routes and infrastructure boosts deployment effectiveness and fleet adaptability to actual needs.

Disciplined Planning and Accountability

Disciplined planning reduces risk and ensures accountability, making funding decisions more reliable and transparent.

Environmental Benefits and Emissions Reduction

Optimally right-sized fleets directly support emissions reduction goals, providing measurable environmental gains.



THANK YOU

2023 e-Cascadia BEV tractor

Next SMARTE Webinar Session:

Dollars and Cents: Costs and Funding

Wed., 5/20/26, 1 p.m. CT

Presenters:

- Juliana VandenBorn, NCTCOG
- Katie Vassalli, The Transport Project

Register here in Microsoft Forms: https://forms.microsoft.com/r/7RQTWUwv5m

Image provided by Getty

CONTACT US

Trey Pope
Air Quality Planner
tpope@nctcog.org | 817-695-9297

Jason Brown
Air Quality Program Manager
jbrown@nctcog.org | 817-704-2514