



WELCOME

Our Progress

OVER

37,000

VEHICLES ON
THE ROAD

OVER

1 Billion

MILES
ACCUMULATED

OVER

2,500

FLEETS



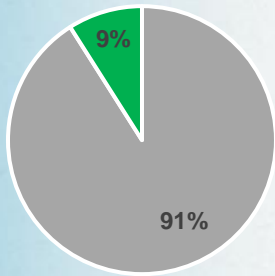


Spark Ignited Offering



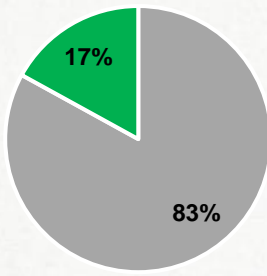
Disruptive Growth in Alt Fuels

FY 2012



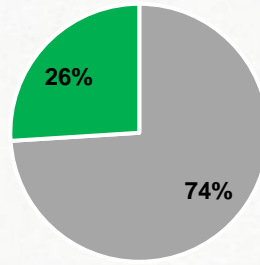
9%

FY 2014



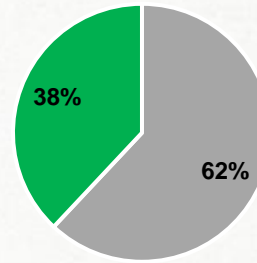
17%

FY 2016



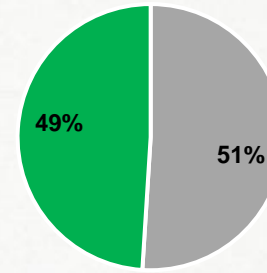
26%

FY 2018



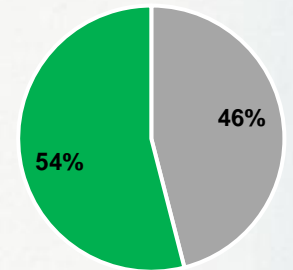
38%

FY 2019



49%






FY 2020



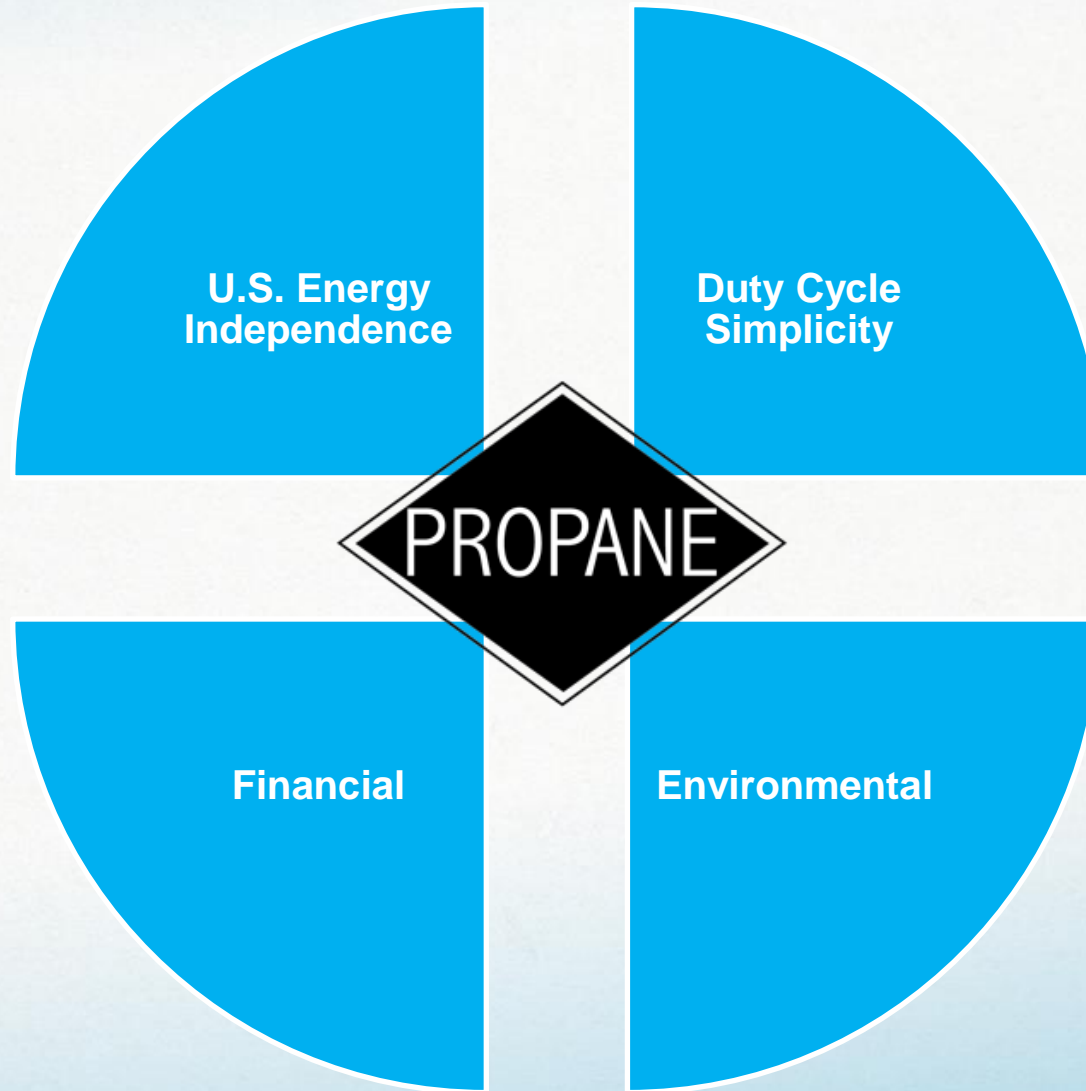
54%



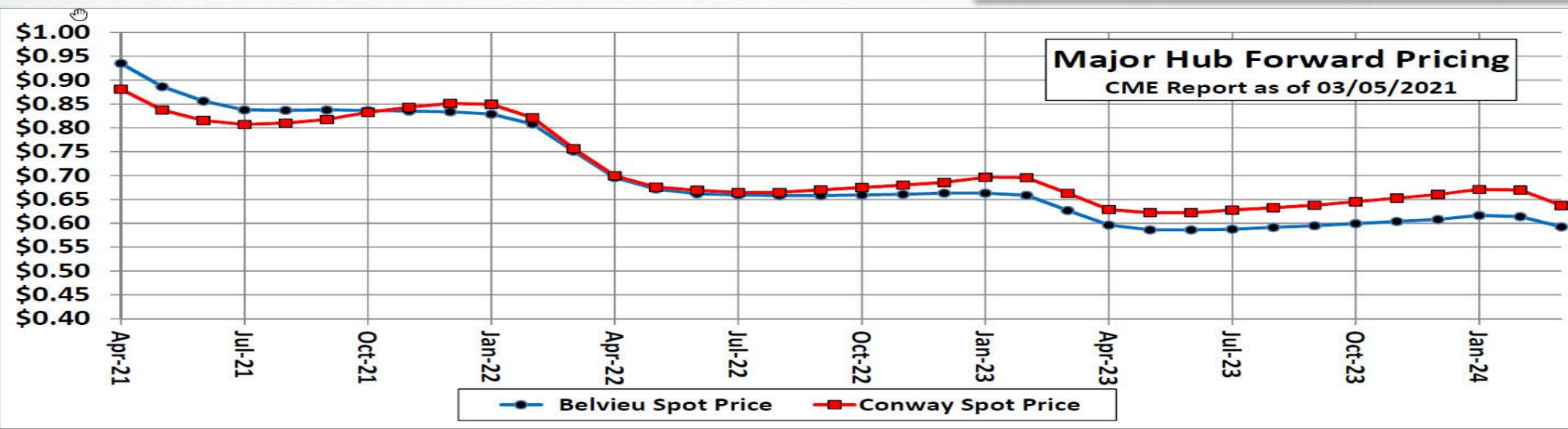
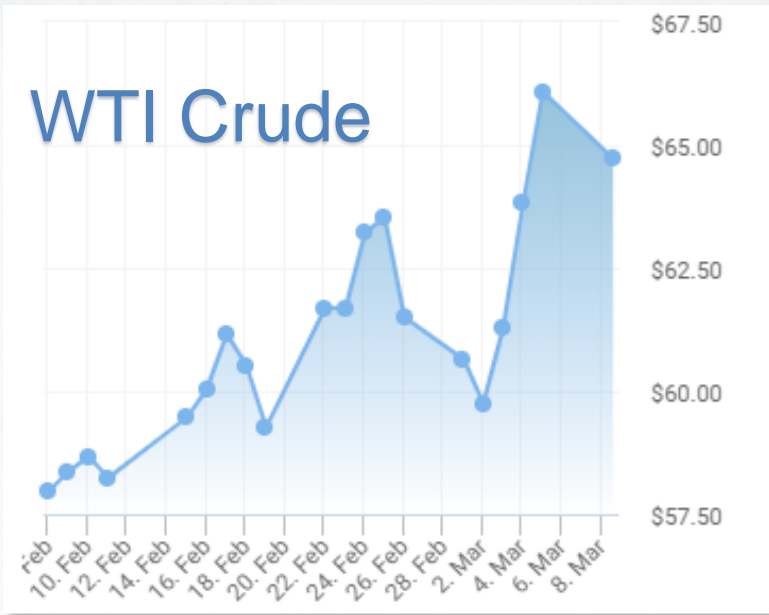
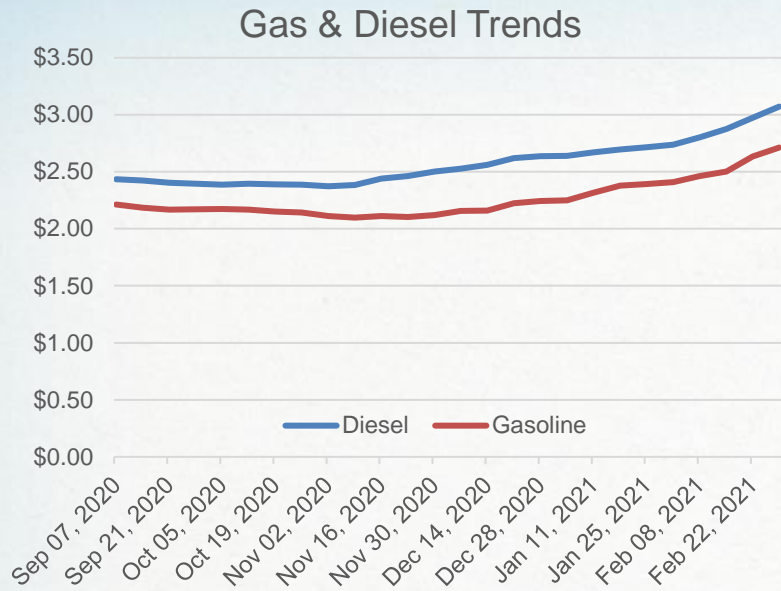
Your Fuel Options

					
Ease of Adoption	✓	✓	✓		
Energy Independence			✓	✓	✓
NOx Emissions			✓	✓	✓
Fuel Infrastructure	✓	✓	✓		
Cost of Ownership			✓		
Range	✓	✓	✓		
Maintenance		✓	✓	✓	✓
Scalable	✓	✓	✓		
Cold Weather Operation		✓	✓		

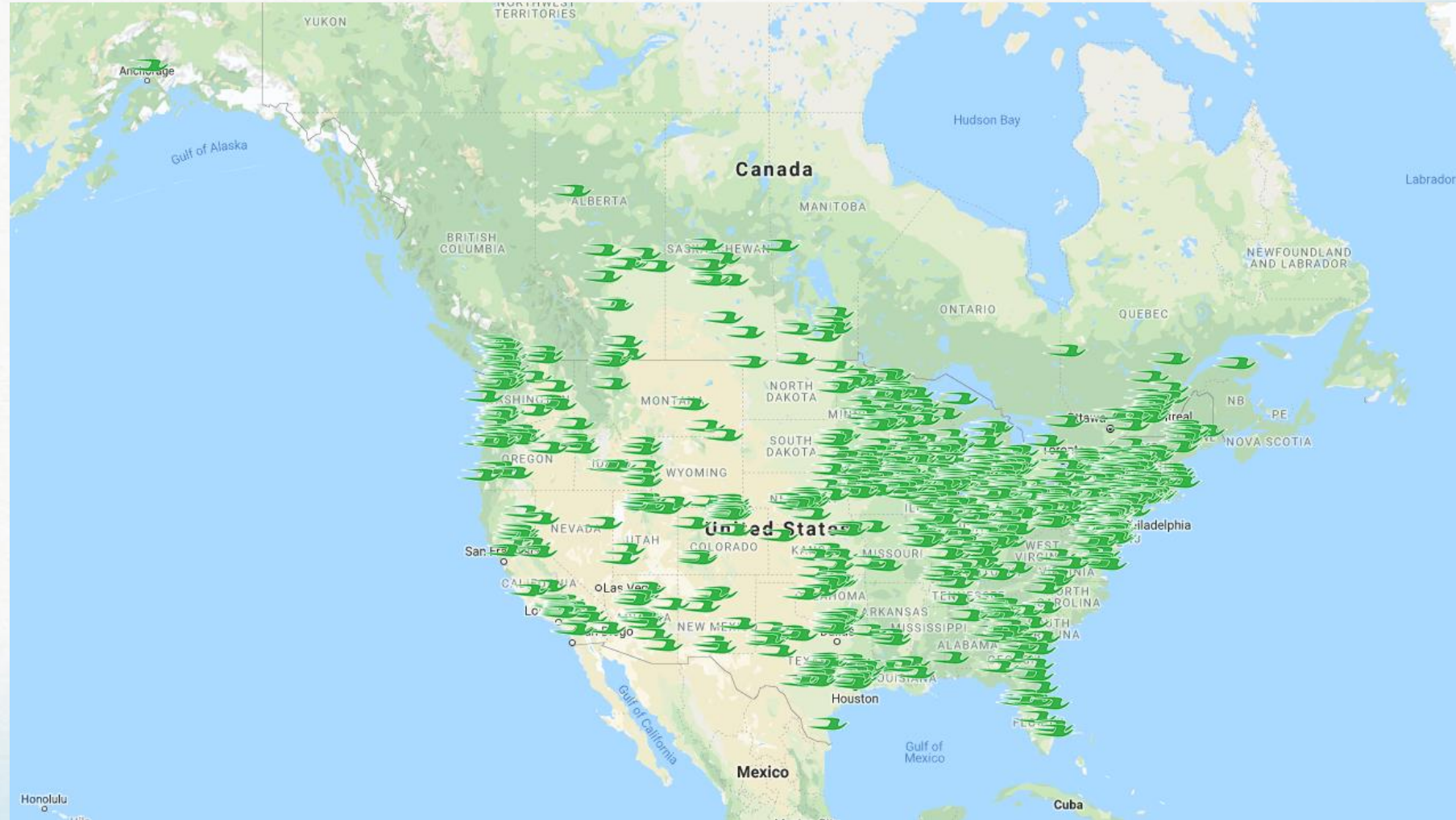
Buyer Motivators



Fuel Landscape & Trends



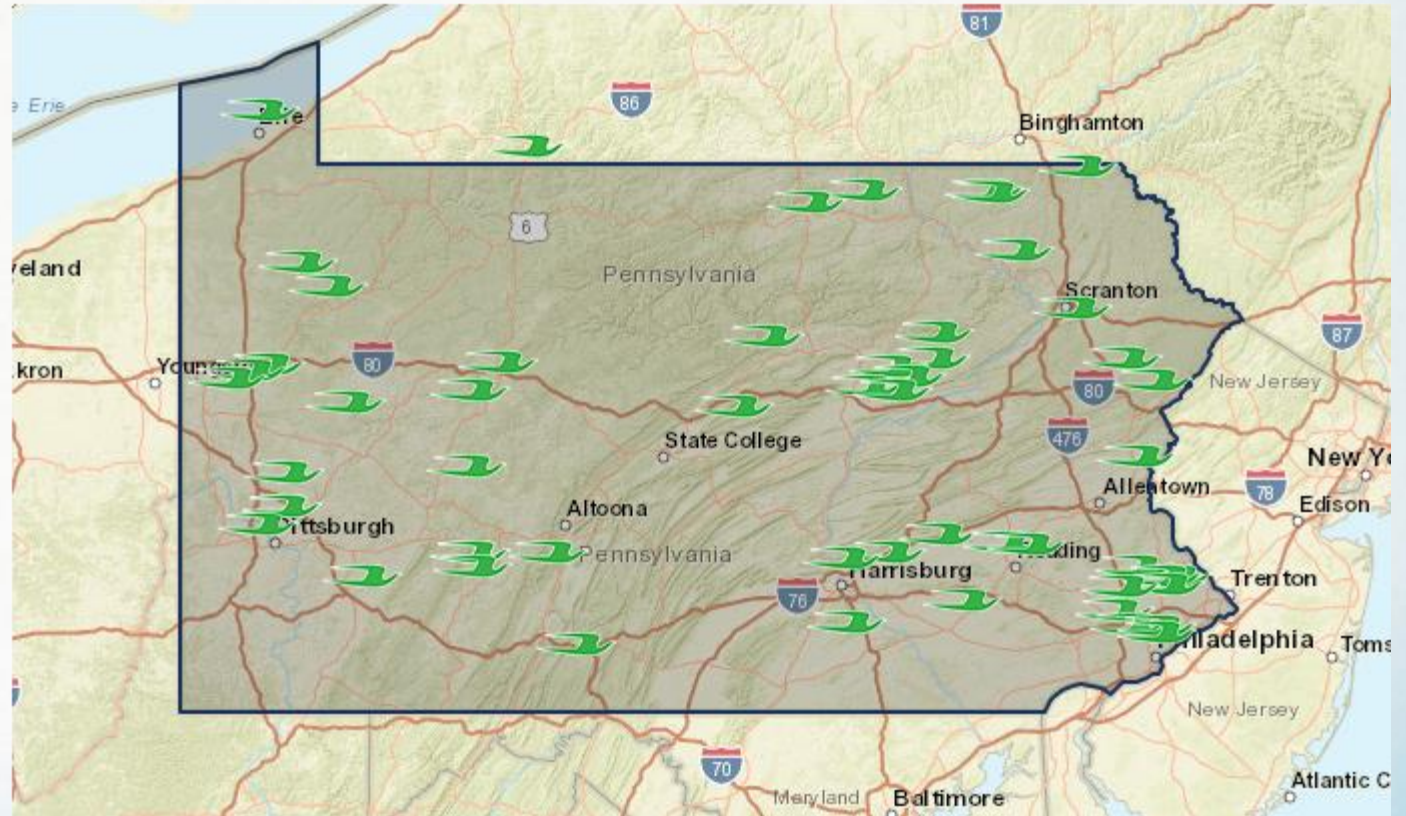
School Bus Deployments – Over 18,000 LPG



Blue Bird / ROUSH PA Deployments

1000+ Propane Buses

- **60+ School Districts**





FORD 7.3L V8 ROUSH GEN 5



Ford 7.3L V8

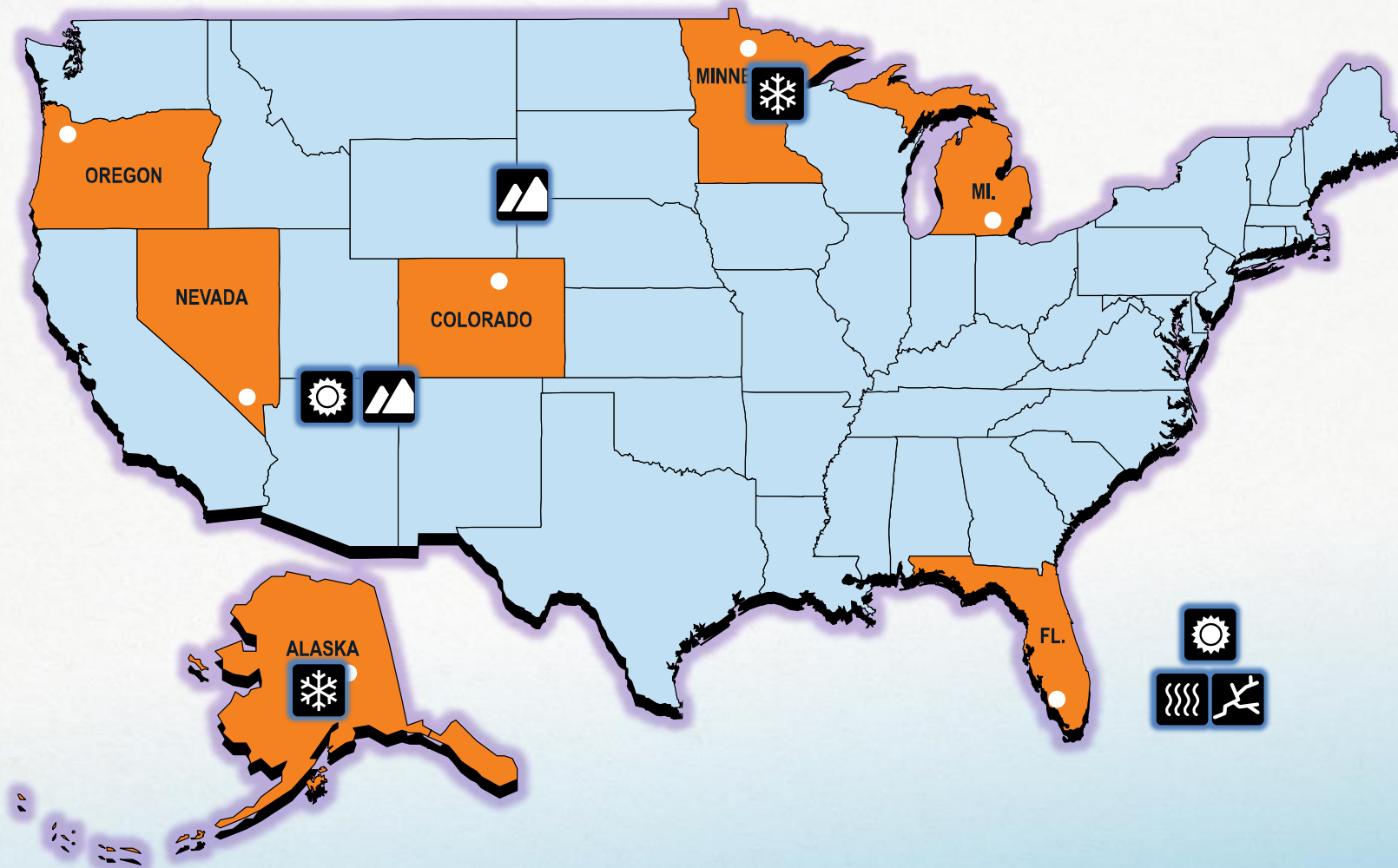
Meaner



Leaner





Cleaner

On-Road Vehicle Testing



**U.S. testing
locations**

7.3L Engine Stats

Engine RPM  Idle: 680 / Max: 4,050	Power  HP: 350 / Torque: 468 ft-lbs. @ 3,900 RPM
Design  90° V8 / 445 CI / Pushrod 2V	Compression  10.5 to 1

7.3

7.3L Scale

- Class 2 – 7
- High Volume
 - >600 / day
 - 6X Competition
- Wide Vocational Usage
 - Parts
 - Support
 - Experience





ROUSH / MICRO BIRD OFFERINGS

System Offerings - School

Model Years

2021

Engine Size

7.3L V8 PFI

Applications

138" wheelbase

6-speed automatic transmission.

Fuel Tank Capacity

Aft-axle: 41 gallons or 155 litres (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 10,050

Requires "91G" gaseous fuels prep. package.

Ford E-350 Single Rear Wheel



System Offerings - School

Model Years

2021

Engine Size

7.3L V8 PFI

Applications

158" wheelbase

6-speed automatic transmission.

Fuel Tank Capacity

Aft-axle: 41 & 64 gallons or 155 & 242 litres (usable)

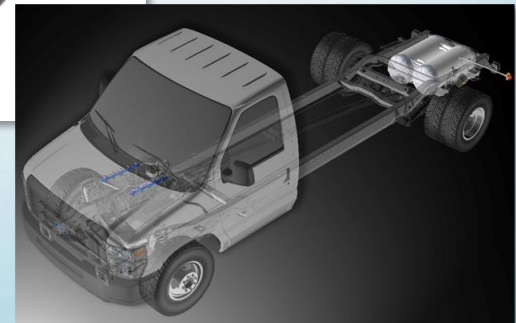
Technical Specifications

EPA and CARB approved.

GVWR: > 14,000

Requires "91G" gaseous fuels prep. package.

Ford E-450 Dual Rear Wheel



System Offerings - Commercial

Model Years

2021

Engine Size

7.3L V8 PFI

Applications

158", 176", 190" wheelbases

6-speed automatic transmission.

Fuel Tank Capacity

Aft-axle: 41 & 64 gallons or 155 & 242 litres (usable)

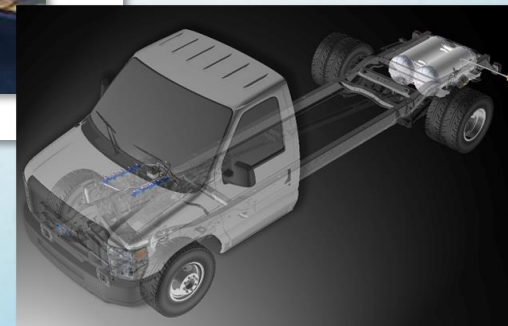
Technical Specifications

EPA and CARB approved.

GVWR: > 14,000

Requires "91G" gaseous fuels prep. package.

Ford E-450 Dual Rear Wheel





ENVIRONMENT

ROUSH 7.3L Propane - Emissions

Emission Constituent	Blue Bird Vision 7.3 LPG
NOx (Nitrogen Oxides)	0.021
HCHO (Formaldehyde)	0.00
PM (Particulate Matter)	0.002
NMHC (Non-Methane Hydrocarbons)	.051
CO (Carbon Monoxide)	5.85
Greenhouse Gas Emissions	
GHG Carbon Dioxide (CO ₂)	545
GHG Methane (CH ₄)	0.032
GHG Nitrous Oxide (N ₂ O)	0.02



- CO₂ & Tier 3
- Approximate average: 70% cleaner than federal standards

LOW SCHOOL BUS EMISSIONS LINKED TO IMPROVED ACADEMIC PERFORMANCE

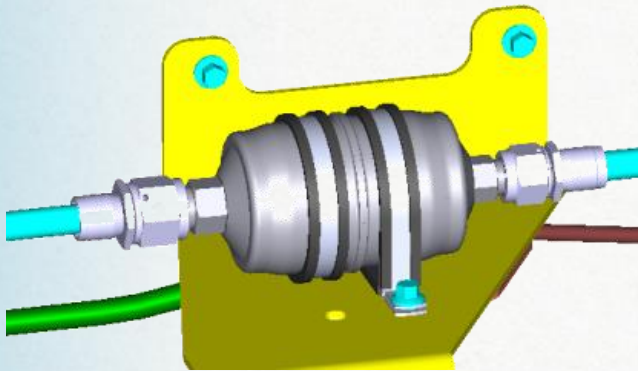


A first-of-its-kind 2019 study released by Georgia State University links low emission on school buses to improved academic performance.

The study found students who rode to school in alternative fuel buses like propane autogas had higher test scores in math and English compared to students who rode to school in diesel buses.

Propane Maintenance – Common

Fuel filtration is the only
unique maintenance item

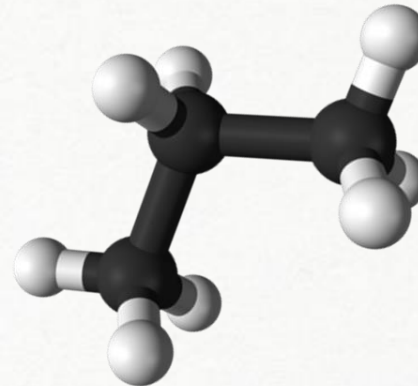


Fluids

Spark
Plugs

Parts

Software
IDS / RDT



Warranty
5yr/UNL

Preventative Maintenance



Ford V8
Gas and Propane
8 Quarts



Various Engines
Diesel
17 – 30 Quarts

Preventative Maintenance

Ford 7.3L V8

Part	Quantity	Price	Total
Element Air Cleaner	1	\$15.75	\$15.75
Oil Spin On Filter	1	\$4.11	\$4.11
Element, PSR, 510 Filter	1	\$24.90	\$24.90
Mobil Special 5W-20	8	\$3.74	\$29.92
			Total \$74.68

\$200.00
Less than
diesel

Cummins ISB 6.7L

Part	Quantity	Price	Total
Oil Filter	1	\$13.75	\$13.75
Fuel Spin-On Filter	1	\$37.90	\$37.90
Power Steering Spin Filter	1	\$9.86	\$9.86
Fuel Filter	1	\$20.53	\$20.53
Allison Control Filter	1	\$8.49	\$8.49
Mobil Fleet 15W-40	18	\$2.59	\$46.62
Cleaner, Air Element	1	\$140.00	\$140.00
			Total \$277.15



Engine Components: Diesel

Cummins ISB 6.7L

Part	Quantity	Price	Total
NOx Sensor	1	\$480.00	\$480.00
NOx Sensor	1	\$560.00	\$560.00
Pressure Sensor	1	\$140.00	\$140.00
Doser Injector	1	\$290.00	\$290.00
Catalyst Assembly w/ DPF	1	\$10,554.11	\$10,554.11
Temperature Sensor	1	\$78.90	\$78.90
Temperature Sensor	2	\$84.90	\$169.80
Turbo	1	\$2,731.20	\$2,731.20
Injector	6	\$755.56	\$4,533.36
EGR Valve	1	\$590.15	\$590.15
EGR Cooler	1	\$923.72	\$923.72

You will not find
any of these parts
on the Propane-
powered Blue Bird
Vision

Total
\$21,051.24

Diesel of Tomorrow

THE NEW PHASE II INTEGRATED SYSTEM CONCEPT

HOW IT WORKS

- The Integrated Rotary Turbine Control enables exhaust gases to bypass the turbine stage and enter the Close Coupled Unit after the gas has been injected with urea by the new Cummins UL4 injector.
- When combined with the Single Module™ chassis mounted aftertreatment, the concept Integrated System has the potential to improve emissions, particularly for cold start and urban driving operations.



Combining Engineering Expertise to Help Customers Address Future Emissions Control Standards

2010



Figure 1. EPA 2010 aftertreatment system layout.

.2 NOx

2024

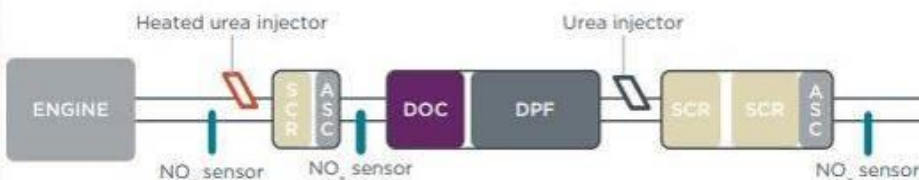


Figure 3. Potential aftertreatment configuration (No. 2) of a CARB 2024 compliant system.

.05 NOx

2027

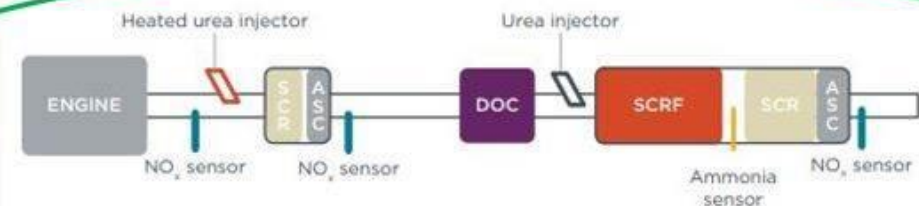


Figure 5. Aftertreatment configuration 2 to meet CARB 2027 standards under FTP and supplemental low-load cycle. Adapted from SwRI (Sharp, 2019).

.02 NOx

Source: "ESTIMATED COST OF DIESEL EMISSIONS-CONTROL TECHNOLOGY TO MEET FUTURE CALIFORNIA LOW NOX STANDARDS IN 2024 AND 2027"
<https://theicct.org/sites/default/files/publications/HDV-emissions-compliance-cost-may2020.pdf>

LPG Meets This Today

Engine Components: Ford Roush

Ford 7.3L V8

Part	Quantity	Price	Total
PCV Hoses (2)	1	\$43.68	\$43.68
Vapor Management Valve	1	\$65.00	\$65.00
Gasket	1	\$5.99	\$5.99
Injector Assembly	8	\$215.00	\$1,720.00
Converter Assembly	1	\$910.00	\$910.00
Spark Plugs	8	\$7.08	\$56.56
O2 Sensors (all 3)	1	102.57	\$102.57
			Total \$2,903.80

A fraction the
cost of diesel
emissions
parts

Full Engine Replacement

Half the
cost of the
competition

Ford 7.3L V8

Part	Price	Labor	Total
Ford 7.3L Engine	\$6,728.91	\$2,640.00	\$9,368.91

Cummins ISB 6.7L

Part	Price	Shipping	Total
Cummins ISB 6.7L	\$18,521.98	\$400.00	\$18,921.98

PSI 8.8L

Part	Price	Core	Total
PSI 8.8L	\$17,014.29	\$3,850.00	\$20,864.29

PSI Engine Quote \$USD\$

Over \$20,000 &
6+ Month Lead Time

Lee-Smith, Inc.

2600 8th Avenue
Chattanooga, TN 37407
Phone: (423) 622-4161
Fax: (423) 629-9540
Email: sales@lee-smith.com
www.lee-smith.com

PARTS QUOTE

Quote: 172622
Date / Time: 11/6/2018 2:56:11PM
Customer: 120562
Branch: CHA
Quote Total: \$20,864.29

Page 1 of 1

Ship

Customer P/O: Inside Slam bodyer

Part / Misc	Description / Ref Number	U/M	Quantity	List	Price	Extended Price
2519792C91	ENGINE, 8.8L GAS AIR BRAKE COM	EA	1	20,757.44	17,014.29	17,014.29
2519792C91-C	ENGINE, 8.8L GAS AIR BRAKE COM-Core	EA	1	4,375.00	3,850.00	3,850.00

Customer Tax ID: 20099017344

Total Parts: \$17,014.29
Total Core Charges: \$3,850.00
Total Core Returns: \$0.00
Quote Subtotal: \$20,864.29
Total Tax: \$0.00
Quote Total: \$20,864.29








Remit To:

Lee-Smith, Inc.
2600 8th Avenue
Chattanooga, TN 37407



Savings Calculation (vs. Diesel)

<https://www.roushcleantech.com/school-bus-calculator/>

									
FUEL								<div>Propane Fuel Price</div> <div>\$1.00</div> <div>Gasoline Fuel Price</div> <div>\$2.79</div>	<div>Diesel Fuel Price</div> <div>\$2.99</div> <div>Electricity kWh</div> <div>\$0.13</div>
Annual Miles per Bus		15,000		15,000	15,000	15,000			
Years Operated		15		15	15	15			
Total Miles Lifetime Miles per Bus		225,000		225,000	225,000	225,000			
Fuel Economy (mpg)		4.50		6.00	8.00	1.40			
Gallons Used Annually per Bus		3,333		2,500	1,875.00	558			
Gallons Used Total per Bus		50,000		37,500	28,125.00	8,365			
Fuel Price / Gallon		\$1.00	\$0.64	\$2.79	\$2.99	\$4.90			
PREVENTATIVE MAINTENANCE								<div>Propane MPG</div> <div>4.50</div> <div>Diesel MPG</div> <div>8.00</div>	<div>Gasoline MPG</div> <div>6.00</div> <div>EV Efficiency kWh/Mile</div> <div>1.40</div>
Oil Interval		5,000		5,000	7,000				
Oil Capacity (Quarts)		7		7	21				
Oil Filter Cost		\$5.00		\$5.00	\$9.36				
Cost per Oil Change		\$22.50		\$22.50	\$61.86				
Lifetime Oil Change Total Cost		\$1,012.50		\$1,012.50	\$1,988.36				
DEF Lifetime Cost					\$2,126				
Fuel Filters Change Interval		50,000			15,000				
Fuel Filters Cost		\$160			\$12.99				
Total Filters Changes		4			15				
Fuel Fiter Cost Lifetime		\$640			\$194.85				
Total Cost		Propane	Propane	Gasoline	Diesel	EV			
Lifetime Cost		\$151,653	\$133,653	\$193,638	\$181,403.21	\$190,000.00			
Lifetime Savings		\$29,751	\$47,751	-\$12,234		(\$8,597)			
Cost per Mile		\$0.67	\$0.59	\$0.86	\$0.81	\$0.84			
			Grants			Grants			
							<div>LPG Fuel Rebate</div> <div>\$0.36</div> <div>LPG Bus Grant</div> <div>\$0.00</div>	<div>EV Bus Price</div> <div>\$93,000</div> <div>EV Bus Grant</div> <div>\$150,000.00</div> <div>Diesel Bus Grant</div> <div>\$0.00</div>	



THANK YOU!