



Derek Whaley
Business Development
North East & Central
North America

ALTERNATIVE FUEL SOLUTIONS:

Powered by:



BLUE BIRD
®



800.59.ROUSH

ROUSHcleantech.com

Enterprise Brand Portfolio

ROUSH[®]

ROUSH Industries

OEM manufacturing, engineering, prototyping and design



Roush Fenway Racing

Dominant NASCAR Sprint Cup racing team



ROUSH Performance

Industry leading high performance vehicles

ROUSH[®]
CLEANTECH

ROUSH CleanTech

Propane autogas powered commercial vehicles.

Alt. Fuel Experience

- Compressed Natural Gas (CNG)

- Design of fuel system.
- Calibration.
- EPA and CARB certification.
- Vehicle integration.



- Electric

- Over 16,000 recharging stations built.
- Blink ECOtality contract with U.S. DOE.

- Hydrogen

- 207.297 MPH (world land-speed record.)
- Vehicle design.
- Aerodynamics development.
- Vehicle fabrication.
- Propulsion system integration.





Financial



Environment



Independence





- ❖ Production:
 - Over 570 engines / day
 - Over 12,500 engines / month
 - Over 90,000 engines in 2015

- ❖ Only ~ 2.5% of Ford's entire 2015 6.8L V10 engine production will end up in a Blue Bird Vision school bus.

- ❖ High Volume Production Benefits:
 - Key in-process checks
 - Production quality
 - Data management / integrity / tracking
 - Improvement in process over time





Challenge:

- Lower fuel lubricity
- Potential for corrosion
- Oxidation
- Higher exhaust gas operating temperatures



Solution:

- Premium exhaust valve and valve seat material alloys
- Developed and tested by Ford
- Achieves excellent hot hardness characteristics
- Reduces wear under extreme exhaust gas temperatures and cylinder combustion pressures.





❖ Production:

- Over 1,300 transmissions / day
- Over 28,600 transmissions / month
- Over 340,000 transmissions in 2015

❖ Less than 0.4% of Ford's entire 2015 6R140 transmission production will end up in a Blue Bird Vision school bus.

❖ High Volume Production Benefits:

- Key in-process checks
- Production quality
- Data management / integrity / tracking
- Improvement in process over time





OVER
9,000
VEHICLES



Ford F-53 / F-59

Ford E-450

Ford F-250/350

Ford F-450/550

Ford F-650 / 750

Blue Bird Vision

Micro Bird G5

Customer Deployments



Customer Deployments



Industry: Education

Location: Omaha, NE

Vehicles: Blue Bird Type C school buses

By The Numbers:

- Saving almost **50% per gallon** on fuel costs compared to diesel.
- **42.6 million** fewer pounds of CO₂ emitted over the lifetime of the fleet.
- **96%** of school bus fleet operating on propane autogas.

“We’ve received large amounts of positive feedback since implementing propane autogas into school districts. Domestically produced, clean propane autogas is a perfect fit for school fleets.”

– **David Prince, general manager**, Student Transportation, Inc.



Industry: Education

Location: Orange County, NY

Vehicles: Blue Bird Type C school buses

By The Numbers:

- Annual fuel savings of about \$21,000 per year.
- 30% less spent on routine maintenance expenses per year.
- About 120,000 pounds of CO₂ per bus eliminated.
- 20% of total bus fleet runs on propane autogas.



“We’ve received large amounts of positive feedback since implementing propane autogas into school districts. Domestically produced, clean propane autogas is a perfect fit for school fleets.”

– **David Prince, general manager**, Student Transportation, Inc.

Industry: Telecommunications

Location: Nationwide

Vehicles: Ford E-series Vans

By The Numbers:

- Save **\$2,500 per vehicle** annually.
- **55% reduction** in fuel costs.
- Reduce CO₂ emissions by **12.5 million pounds**.



“These clean-burning propane autogas vehicles are better for our environment, our communities and operate more efficiently. DISH expects to save about \$2,500 per vehicle in annual lifecycle costs due to a 55 percent reduction in fuel costs and the cleaner burning properties of propane autogas.”

– **Erik Carlson, executive president of service and installation, DISH Network**

Alpha Bakery

Industry: National Bakery Products
Manufacturer and Distributor

Location: Chicago, Ill.

Vehicles: 22 E-450 step van delivery
trucks

Challenge: To replace aging delivery trucks
fueled by conventional diesel
with a sustainable,
readily available alternative
energy.



“After much research and testing, we decided to integrate clean-burning propane autogas into our fleet. The technology is here, and it is the right thing to do. It is better for the environment, it is good for the economy, and it reduces our dependency on foreign oil.”

– **Bob McGuire, vice president and director of logistics, Alpha Baking Company, Inc.**

Industry: Railroad

Location: San Bernardino, California

Vehicles: Ford E-350 Passenger Van

By The Numbers:

- \$14,500 savings per vehicle.
- 400,000 fewer lbs of CO₂ / year.



“Choosing propane autogas to fuel our fleet vehicles has allowed Renzenberger to reduce the carbon footprint of our company and lower fuel costs, while providing a safe, sustainable and reliable transportation solution to transport California employees.”

- Karen Seitter, president, Renzenberger

Industry: Education

Location: Phoenix, AZ

Vehicles: Micro Bird G5 Type A school buses
Blue Bird Type C school buses
F-250 pickup trucks

By The Numbers:

- **82%** fuel savings per gallon compared to diesel.
- **\$6,500** reduction in fuel costs per bus / per year.



“I’m conservative when I run numbers, and the savings were amazing. Not only with fuel and maintenance, but the initial upfront costs were also considerably cheaper than comparable diesel-powered buses would have been,” says Latko. **“We’re saving a total of 37.7 cents per mile with propane autogas.”**

- **Ron Latko, director of transportation and vehicle maintenance, Mesa Public Schools**

Industry: Government

Location: Seattle, WA

Vehicles: Ford F-250 Pickup Trucks
Ford F-350 Pickup Truck
Ford E-250 Cargo Van

By The Numbers:

- **11,200** fewer gallons of gasoline year.
- **77,280** fewer lbs of CO₂ / year.
- **\$15,338** reduction in fuel costs / year.



“For the driver, it’s pretty much seamless other than you fill up at a propane tank instead of a gas dispenser. Range is approximately the same and fuel economy is approximately the same. A big advantage is that with the federal rebate being offered on propane autogas fuel, the cost of fuel is currently considerably less than the price of gasoline. So right now that’s a big advantage.”

- **Robert Toppin**, Equipment Supervisor, King County

Colorado Mountain Express

Industry: Airport Transportation

Location: Vail, Colorado

Vehicles: 4 Ford E-350 Passenger Vans

By The Numbers:

- Over **15,000** fewer gallons of gasoline / van.
- **42,689** fewer lbs of CO₂ / van.
- **\$18,600** reduction in fuel costs / van.



“Propane autogas has become the alternative fuel of choice for the shared-ride industry. This domestic fuel is not only more economical than gasoline, its clean-burning properties work to preserve the pristine environment in which we live and work – something that is extremely important to our company.”

- **Robert Tschupp**, Vice President and General Manager, Colorado Mountain Express



Model Years

2017

Engine Size / Manufacturer

6.8L V10 (3V) Ford Engine with exclusive ROUSH
CleanTech Propane Fuel System

Applications

169" / 189" / 217" / 238" / 252" / 273" / 280"
wheelbase configurations

6-speed automatic transmission

Fuel Tank Capacity

Short: 50 gallons (47 usable)

Mid-Ship: 70 gallons (67 usable)

Extended Range: 100 gallons (93 usable)

Technical Specifications

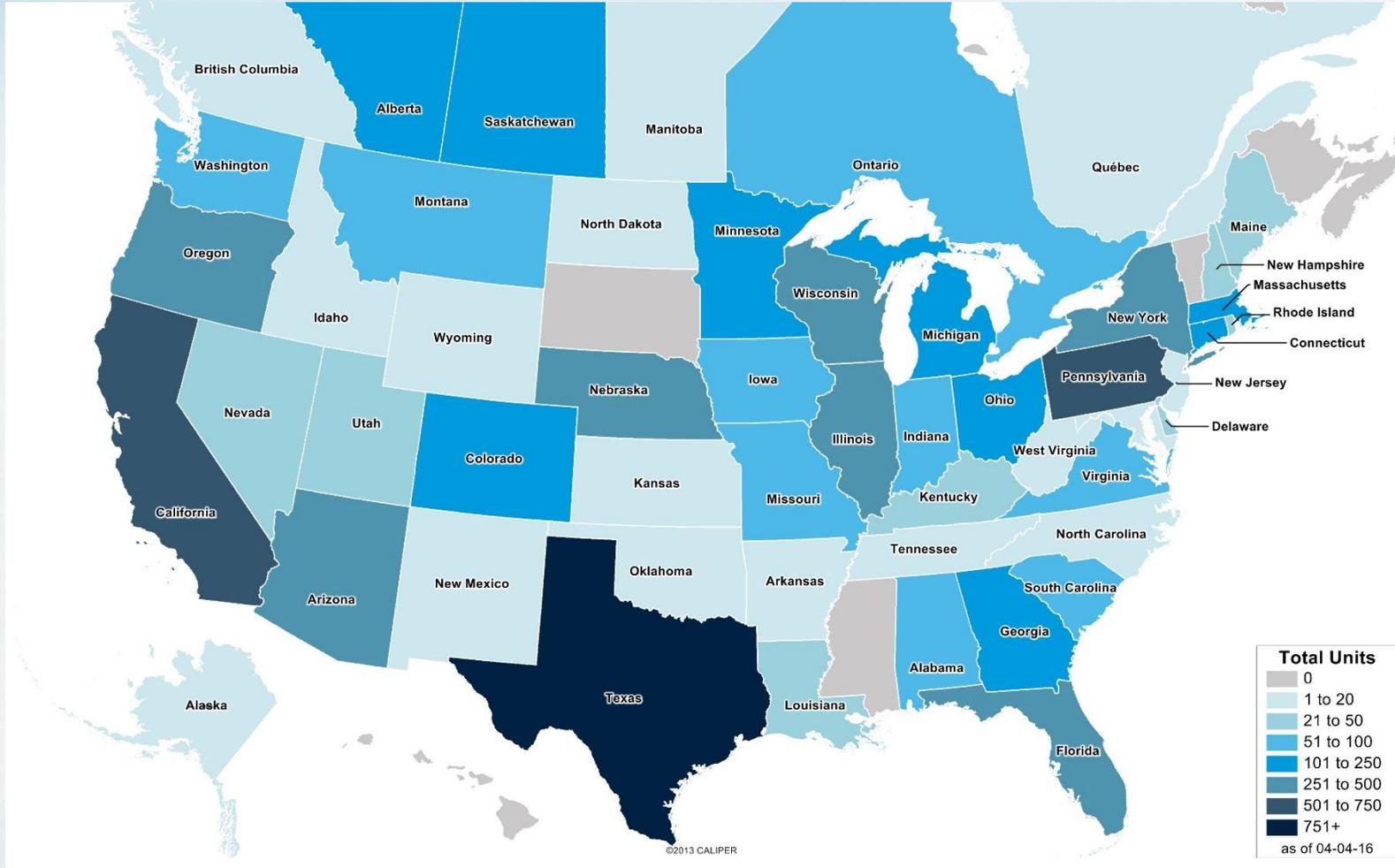
EPA and CARB approved

GVWR: 33,000 lbs

Up to 77 passengers

Blue Bird Vision (Type C)





7,500 Ford/ROUSH propane powered Blue Bird Visions sold since introduction



SERVICE & WARRANTY

Training, Basic Coverage
and Special Tools





At a high level, customers are tired of the increasing complexity and cost of operations diesel buses have transitioned to in order to meet ever tightening emissions standards.

Complexity and costs are estimated to continue increasing over the next few years as the new Green House Gas emission standards come into play.

*EPA and NHTSA, on behalf of the Department of Transportation, are each proposing rules to establish a comprehensive Phase 2 Heavy-Duty (HD) National Program that will reduce greenhouse gas (GHG) emissions and fuel consumption for new on-road heavy-duty vehicles including buses. This technology-advancing program would phase in over the long-term, beginning in the 2021 model year and culminating in standards for model year 2024 or 2027 depending on the final rule. **The agencies estimate that the additional costs to meet the proposed standards for vocational vehicles is in the range of \$1,150 to \$1,990 per vehicle in the first year (2021) and \$1,770 to \$3,590 per vehicle in years 2024-27.***



PRODUCT IMMERSION TOUR

Components to Eliminate by switching to Propane



Charged Air Cooler



EGR Cooler







Turbo Charger







Pre-Oxidation Catalyst





Dosing Module





Heated Supply Line





Dosing Control Unit





Assembly for DEF Tank





DEF Tank





SCR Catalyst







Ford V10
Gas and Propane
7
Quarts

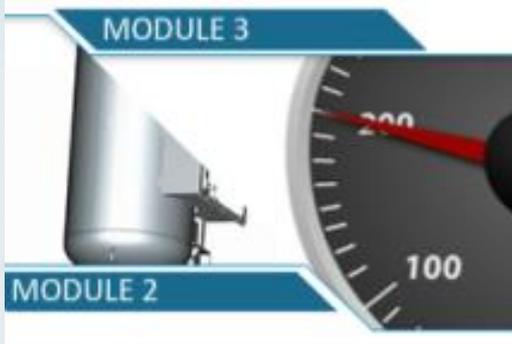


Diesel Engine
17-30
Quarts

- National footprint:
 - Locations in every customer deployment area.
- Training program:
 - System overview.
 - Service diagnostics.
 - Repair procedures.
 - Warranty claim process.
 - Service manual review.
 - Contact information.
- Web-based training.



Product Training



Installation Support



Technical Hotline



Field Support



Warranty Support

ROUSH Warrantly Claim Process and Procedures
CLEANTECH For R0USH CleanTech Lubricant Service Centers



Warranty Claims Process:

1. Confirm R0USH CleanTech Warranty Department at 800.59.ROUSH (7667) or visit us online to begin the warranty claim process. R0USH CleanTech may require labor-related information to determine if the labor is related to the R0USH CleanTech product.
2. If the vehicle concern is determined to be a R0USH CleanTech covered concern, please complete the R0USH Warranty Claim Form and attach it with a copy of the most recent vehicle maintenance and diagnosis report to be performed or related to the applicable R0USH CleanTech Service and Diagnostic. Please email it to warranty@roushcleantech.com or fax it to 800.59.ROUSH (7667).
3. Once the claim is authorized by R0USH CleanTech, you will receive the Warranty Claim Form back with a Warranty Authorization Number on the bottom.
4. Once the claim is authorized by R0USH CleanTech, you will receive the Warranty Claim Form back with a Warranty Authorization Number on the bottom.
5. Replacement parts will be shipped to you. R0USH CleanTech does not provide labor services.

PLEASE NOTE: If additional parts to warranty, you will receive authorization from R0USH CleanTech prior to processing.

PLEASE NOTE: Any unrelated work performed may not be covered by R0USH CleanTech.

Warranty Parts Return Procedure:

- All defective parts must be returned to R0USH CleanTech within 30 days of the warranty claim completion.
- If a Return Material Authorization (RMA) number is not a return option is listed in our instruction with replacement parts, please call 800.59.ROUSH (7667), then visit us.
- The only acceptable reason for the return of parts is a defective part, not a shipping issue.
- Parts must be shipped individually with a part tag that includes the vehicle number, our sign-off on the vehicle and number and the RMA number.
- All freight return and using the provided R0USH CleanTech return label will require you to call R0USH CleanTech at 800.59.ROUSH (7667) for return instructions. R0USH CleanTech return labels will require you to call R0USH CleanTech at 800.59.ROUSH (7667) for return instructions. R0USH CleanTech return labels will require you to call R0USH CleanTech at 800.59.ROUSH (7667) for return instructions.

Return Instructions: Please email to warranty@roushcleantech.com or fax to 800.59.ROUSH (7667).

Field Data Analysis





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