



# PROPANE AUTOGAS:

The Zero Compromise Alternative Fuel Solution



## Today's Presenters:

- Tucker Perkins, Propane Education and Research Council
- Steve Whaley, Alliance AutoGas
- Todd Mouw, ROUSH CleanTech
- Melody Bennett, King County, Washington



# Propane Autogas: Why it's the right fuel for your fleet.

Tucker Perkins  
Chief Business Development Officer  
September 6, 2012



# Propane Education & Research Council (PERC)



- *Authorized by the U.S. Congress October 11, 1996; governed by 21-member industry board of directors appointed by NPGA and GPA*
- *Funded by 4/10-cent per gallon (\$39 million revenues projected for 2012)*
- *Functions:*
  - › *Research & Development*
  - › *Employee and Consumer Safety & Training*
  - › *Public Education with restrictions*
- *Strategic Objective:*
  - › *To promote the use of odorized propane through the development and commercialization of promising propane equipment, appliances and vehicles; and through training and safety support in traditional residential, commercial and agricultural markets.*

Propane autogas fuels  
more than **17 million vehicles**  
worldwide.



IN THE UNITED STATES,  
**PROPANE AUTOGAS**  
IS THE LEADING  
ALTERNATIVE FUEL

# Propane autogas is:



- **ABUNDANT**
  - › The U.S. is now a net exporter of propane.
  - › 70 percent of propane comes from natural gas.
- **SUSTAINABLE**
  - › Propane is positioned at the intersection of environmentally friendliness and cost effectiveness.
- **CONVENIENT**
  - › Propane autogas has the most developed refueling infrastructure of all alternative fuels in the United States.
- **DOMESTIC**
  - › 97 percent of propane autogas consumed in the U.S. is produced in North America.

Propane Autogas:  
**Green Your Fleet.**



# Propane autogas is a **Clean-burning fuel.**



**60** % **LESS**  
Carbon  
Monoxide

**12** % **LESS**  
Carbon  
Dioxide

**20** % **LESS**  
Nitrogen  
Oxide

**40** % **FEWER**  
Smog Producing  
Hydrocarbons  
while Fueling

Propane Autogas:  
**Fuel Your Fleet.**

# Propane autogas

- Generally costs **30% less than gasoline** and **50% less than diesel.**
- Infrastructure is **affordable.**
  - › **15 to 1**



# The Bottom Line



- Propane autogas has the lowest cost of entry of any alternative fuel.
  - › Low Up Front Vehicle Cost.
  - › Low On-Site Refueling Cost.
  - › More Public Refueling Stations than any other alternative fuel.
  - › Abundant Low Cost Fuel.
  - › Domestically Produced Fuel.
  - › Environmentally Friendly.



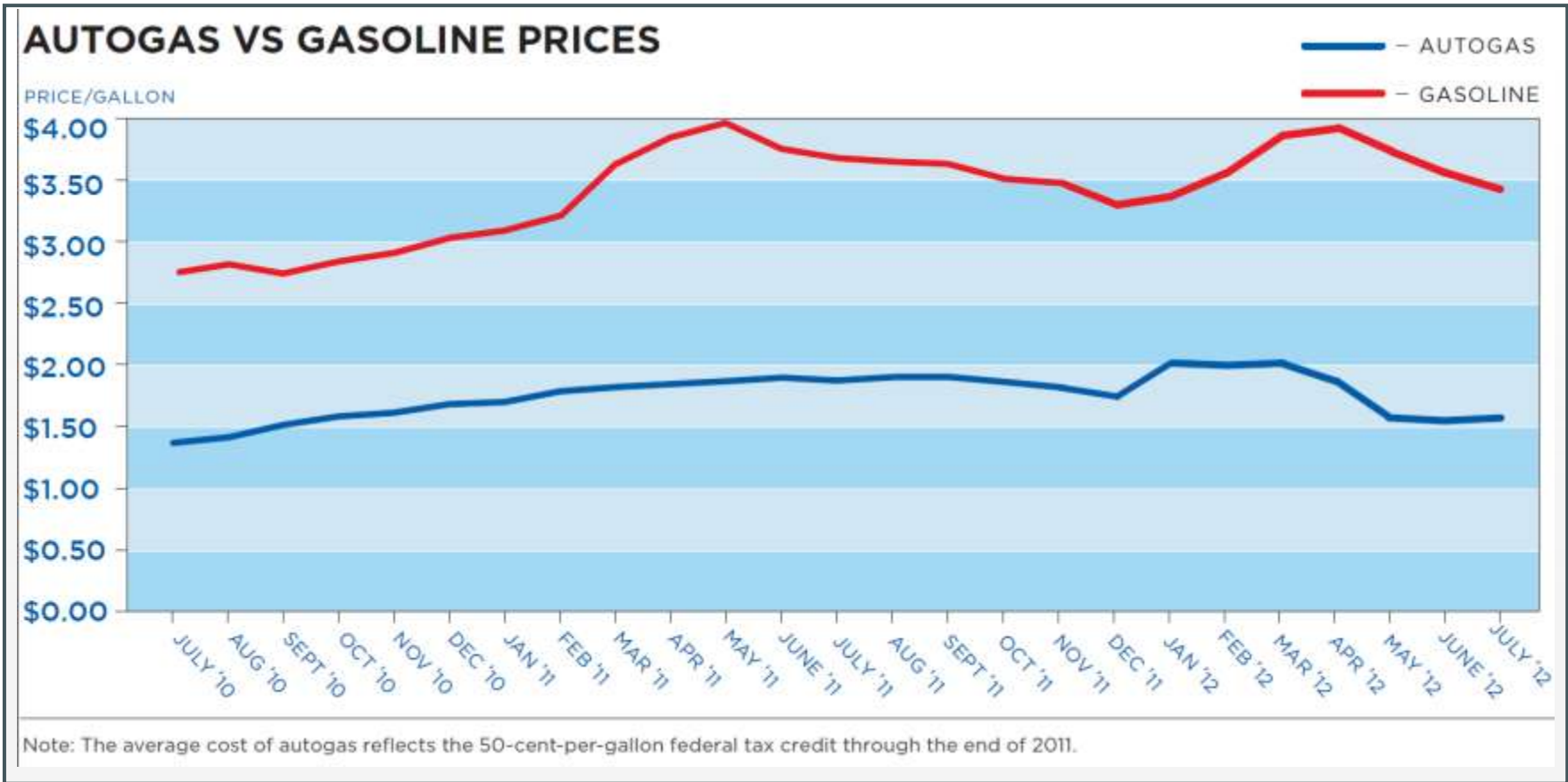
**PROPANE**  
education & research  
**COUNCIL**



## Propane Autogas Fueling

*Steve Whaley; Alliance AutoGas*

# COST SAVINGS



- Fleets save more than \$1.50/gallon versus gasoline on fuel costs
- Autogas fleets report reduced vehicle maintenance and extend engine life



# BUILDING AN AUTOGAS PROGRAM

## The program has three core components:

- Consult- Help fleets identify the best propane autogas fueling solution
- Equip- Everything fleets need to make shifting to autogas easy & affordable
- Support- Ongoing training and technical support to ensure a fleet's autogas program is a success





# ALLIANCE AUTOGAS FUELING

## The Alliance AutoGas Fueling Solution Includes:

- Spill-free fueling station at fleet base
- No fueling equipment cost for fleets
- Guaranteed fuel supply
- Autogas data integration with fuel management systems
- Comprehensive autogas education includes extensive safety and operational training
- Ongoing support and training
- 24-hour safety support
- Green branding message support



# A SCALABLE FUELING SOLUTION



# A SCALABLE FUELING SOLUTION



# A SCALABLE FUELING SOLUTION



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# A SCALABLE FUELING SOLUTION



# A SCALABLE FUELING SOLUTION





# FUEL SUPPLY AND CUSTOMER TRAINING

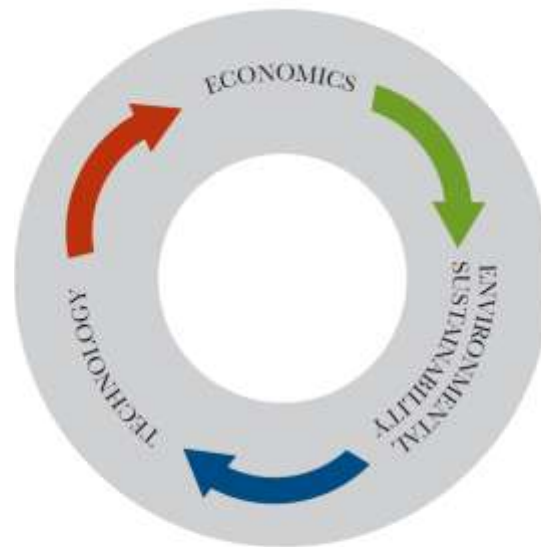


# MAJOR MARKETS WITH ALLIANCE PRESENCE



# ALTERNATIVE FUEL COMPARISON

Sustainable transportation is based on a value equation that balances:



Autogas vehicle and infrastructure implementation is much less expensive than any other alternative fuel.



# MOUNTAIN MOBILITY, NC

*Making the switch to a propane autogas system was an easy decision for the Buncombe County Commissioners to make, after learning about the environmental benefits, fuel savings and lower-maintenance advantages of propane autogas.*



**Lori Hembree,**  
**Director of Mountain Mobility**



# DENVER, CO



## Denver Yellow Cab

### Fleet Statistics

- 50 Ford Crown Victorias
- Anticipated annual gallon usage: More than 200,000
- Onsite fueling from Alliance AutoGas
- Time operating on autogas 4 years
- Estimated annual fuel cost savings:  
**\$300,000 for 50 vehicles**



**Fleet Sound Bite:** Drivers happily report lower fuel cost and cite the fueling station at their fleet base as a convenient perk of running cabs on propane autogas.



# IREDELL COUNTY, NC



## Iredell County Sheriff's Department

### Fleet Statistics:

- 26 Ford Crown Victorias
- Anticipated annual gallon usage: 52,000
- 2 fueling stations from Alliance AutoGas
- Time operating on autogas 9 months
- Estimated annual savings:

**Nearly \$40,000 for 26 vehicles**



**Fleet Sound Bite:** “We’re saving 40 to 50 percent on fuel costs. We like the fact that the cars are clean burning and efficient, and we like that they’re dual fuel” Captain Phillips



# JACKSON COUNTY, GA



Sheriff Stan Evans  
Jackson County, Georgia

Following the conversions of their first four autogas-powered cruisers, the department liked what they saw and began expanding their program. They are saving tax-payer dollars by **reducing fuel costs more than 30 percent**, and as their autogas fleet continues to grow, so do their fuel cost savings.

## FLEET STATISTICS

### FLEET TYPE:

Law Enforcement

PERCENT OF FLEET RUNNING  
ON AUTOGAS: 66%

AUTOGAS VEHICLES IN FLEET:  
60 (58 Ford Crown Victorias; 2  
pick-up trucks)

ADDITIONAL VEHICLES SLATED  
FOR AUTOGAS CONVERSION:  
20

### ANNUAL COST SAVINGS:

\$110,000 - \$145,000

With autogas use versus gasoline  
gallon equivalent

ANTICIPATED ANNUAL USAGE  
(gallons propane autogas):

120,000- 140,000

### AUTOGAS FUELING:

Onsite autogas fueling infrastructure  
including 18,000-gallon autogas tank.

TIME OPERATING ON AUTOGAS:

3 years



# RALEIGH



## Raleigh Police Department

### Fleet Statistics

- 10 Ford Crown Victorias
- Anticipated annual gallon usage: 39,600
- Onsite fueling from Alliance AutoGas
- Time operating on autogas 4 months
- Estimated annual fuel cost savings:  
**\$30,000 for ten vehicles**



**Fleet Sound Bite:** RPD estimates they will reduce annual gasoline used by 30,000 to 36,000 gallons and save close to \$30,000 in fuel costs. The department also expects reduced maintenance costs due to the high-octane rating of propane autogas.





# RALEIGH



*Chief Harry Dolan, City of Raleigh Chief of Police*



# AIRPORT SHUTTLE, NEW ORLEANS



*The price differential makes autogas a very attractive alternative fuel. When we looked at how quickly we would reach a return on investment, it was a no-brainer. All our vehicles will eventually run on autogas.*

***Don Duverney, Airport Shuttle General Manager***



# MUSCOGEE COUNTY, GA



*Alternative fuels are an undeniable part of the nation's future, and at Muscogee County we are excited to be a part of that evolution now.*

***Sheriff John Darr, Muscogee County***



# GREENVILLE COUNTY SHERIFF, SC



*We're pleased to be converting 100 of our county's vehicles to propane autogas with the program, and we're also excited to be a certified conversion center and help deploy this project – and continue alternative fuel conversions for the county after the project concludes.*

***Alan Fairfield, County Fleet Director***



# Q&A

## **Website:**

[www.allianceautogas.com](http://www.allianceautogas.com)

## **Contact:**

Steve Whaley, Alliance AutoGas

[swhaley@allianceautogas.com](mailto:swhaley@allianceautogas.com)

864.923.5000





# LIQUID PROPANE AUTOGAS:

## Product Introduction & Overview



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# ROUSH CLEANTECH

## Company Background & History

## What are We Best Known For?

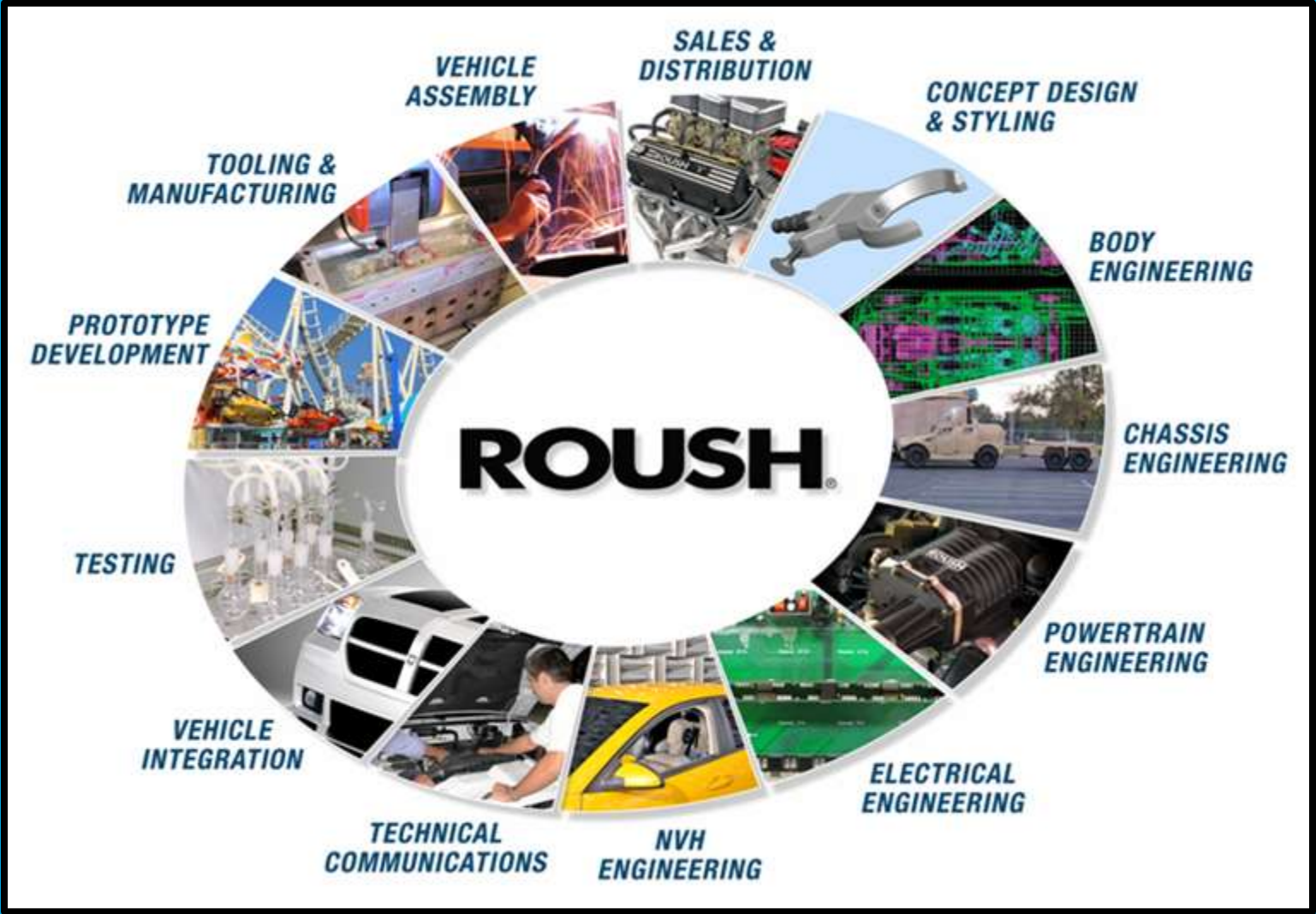
Largest and most successful team in motorsports history

- Motorsports Management
- Licensing
- Retail Operations





# Corporate Overview



Corporate Wheel of Capability

# Corporate Overview

## Transportation

- Ford
- Chrysler
- GM
- Toyota
- Honda
- Hyundai
- Isuzu
- Volkswagon
- EcoMotors
- VPG
- Navistar
- Bluebird

## Defense

- Navistar Defense
- BAE Systems
- AM General
- General Dynamics
- SAIC
- Textron
- FAAC
- US Army/TARDEC
- Oskosh Defense
- Hardwire
- Astradyne

## Entertainment

- Disney
- Universal Studios
- Disneyland Paris
- Universal Studios Orlando
- Hong Kong Disneyland
- Disney California Adventure
- Universal Studios Singapore
- The Henry Ford

## Life Sciences

- GE Healthcare
- VWR
- UPG
- DeGroot
- Terumo
- Stryker
- Covidien
- Somanetics
- Genetix
- Merck
- Invacare

## Motorsports

- Ford
- 3M
- Aflac
- Crown Royal
- UPS
- Scotts
- Kellogg
- Valvoline
- Coca-cola
- Fastenal



## **PRODUCT OVERVIEW:**

Pickups | Vans & Wagons | Cutaway Vans  
Chassis Cab | School Bus

## Liquid Propane Autogas Vehicles

- Light & medium duty Ford trucks & vans, school bus.
- Factory Ford warranty maintained.
- No loss of HP / torque / towing capacity.
- Serviceable with existing diagnostic equipment.
- EPA & CARB Certified.



Ford E-150 / E-250 / E-350

Ford E-350 SRW Cutaway

Ford E-450 DRW Cutaway

Ford F-450 / F-550

Blue Bird Vision School Bus

# Product Overview – Vans & Wagons

## Ford E-150 / E-250 / E-350

<b>Model Years:</b>	2009 – 2013
<b>Engine Size:</b>	5.4L V8 (2V)
<b>Applications:</b>	Extended or Regular Cargo Van, Club Wagon, SRW Cutaway (S3H) All rear-axle configurations 4-speed automatic transmission
<b>Tank Sizes:</b>	Mid-Ship: 25 usable gallons In-Cab: 46 usable gallons
<b>Technical Specs:</b>	EPA and CARB approved GVWR: < 10,000 lbs. Requires “91G” gaseous fuels prep package.
<b>Order Availability:</b>	Ford Ship Through Conversion Kits



# E-series Mid-Ship Fuel Tank

## FRPCM

The Fuel Rail Pressure Control Module ensures consistent vehicle performance and power on-demand.

## Fuel Rail

ROUSH CleanTech's signature blue anodized aluminum fuel rail is designed to operate under varying temperatures of liquid propane

## Fuel Fill

Industry-standard valve designed to allow for safe passage of liquid propane into the vehicle. Includes a check valve to prevent fuel leaks.

## Fuel Tank

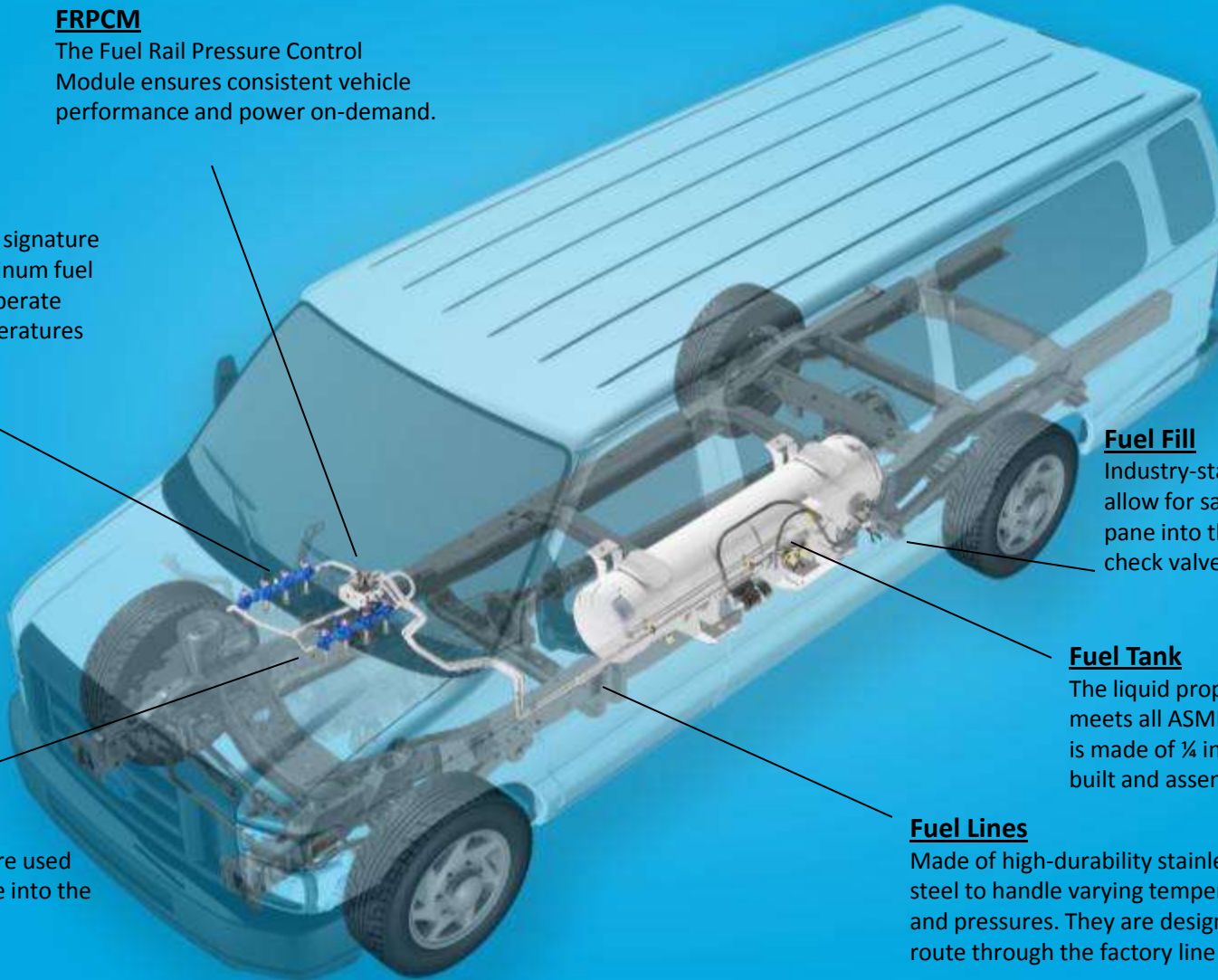
The liquid propane autogas fuel tank meets all ASME certification standards, is made of ¼ inch thick steel, and is built and assembled in the USA.

## Fuel Lines

Made of high-durability stainless steel to handle varying temperatures and pressures. They are designed to route through the factory line locations.

## Fuel Injectors

Special fuel injectors are used to inject liquid propane into the cylinders for ignition.



# Product Overview – Vans & Wagons

## Ford E-450 DRW Cutaway

<b>Model Years:</b>	2009 – 2013
<b>Engine Size:</b>	6.8L V10 (2V)
<b>Applications:</b>	156” or 176” wheelbase Stretched Chassis 5-speed auto transmission
<b>Tank Size:</b>	Aft-Axle: 41 usable gallons
<b>Technical Specs:</b>	EPA and CARB approved GVWR: < 14,500 lbs. Requires “91G” gaseous fuels prep package.
<b>Order Availability:</b>	Ford Ship Through Conversion Kits



# Product Overview - Pickups

## Ford F-250 / F-350

<b>Model Years:</b>	2012 - 2013
<b>Engine Size:</b>	6.2L V8 (3V)
<b>Applications:</b>	4x2 or 4x4 All bed configurations All body configurations All rear axle configurations (including chassis cab)
<b>Tank Sizes:</b>	Under-Bed: To Be Determined In-Bed: 38 usable gallons
<b>Technical Specs:</b>	EPA and CARB approved GVWR: ≤ 13,300 lbs. Requires "98F" gaseous fuels prep package.
<b>Order Availability:</b>	Ford Ship Through Conversion Kits
<b>Available</b>	October, 2012





# F-250 In-Bed Fuel Tank

## FRPCM

The Fuel Rail Pressure Control Module ensures consistent vehicle performance and power on-demand.

## Fuel Rail

ROUSH CleanTech's signature blue anodized aluminum fuel rail is designed to operate under varying temperatures of liquid propane

## Fuel Fill

Industry-standard valve designed to allow for safe passage of liquid propane into the vehicle. Includes a check valve to prevent fuel leaks.

## Fuel Tank

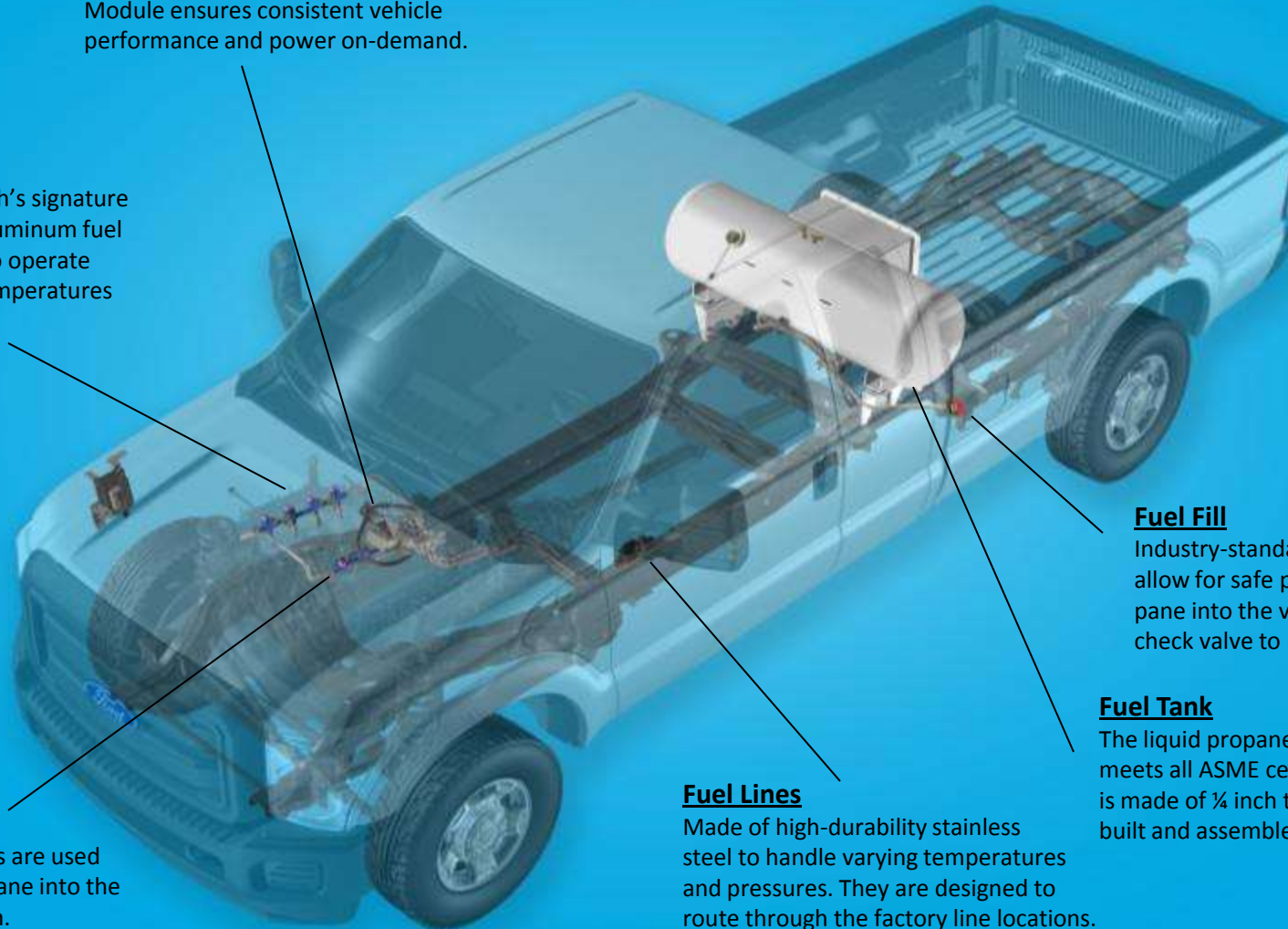
The liquid propane autogas fuel tank meets all ASME certification standards, is made of ¼ inch thick steel, and is built and assembled in the USA.

## Fuel Lines

Made of high-durability stainless steel to handle varying temperatures and pressures. They are designed to route through the factory line locations.

## Fuel Injectors

Special fuel injectors are used to inject liquid propane into the cylinders for ignition.



# Product Overview – Chassis Cab

## Ford F-450 / F-550

<b>Model Years:</b>	2011 - 2013
<b>Engine Size:</b>	6.8L V10 (3V)
<b>Applications:</b>	All cab configurations All wheelbase configurations 5-speed automatic
<b>Tank Sizes:</b>	To Be Determined.
<b>Technical Specs:</b>	EPA and CARB Approved GVWR: 16,500 – 19,500 lbs. Required “98G” gaseous fuel prep package.
<b>Order Availability:</b>	Ford Ship Through Conversion Kits
<b>Available:</b>	Q1, 2013



# Product Overview – Chassis Cab

## Ford F-650 Chassis Cab

<b>Model Years:</b>	2012 - 2013
<b>Engine Size:</b>	6.8L V10 (3V)
<b>Applications:</b>	All cab configurations All wheelbase configurations 6-speed auto transmission
<b>Tank Sizes:</b>	To Be Determined.
<b>Technical Specs:</b>	EPA and CARB approved GVWR: < 30,000 lbs. Requires “98G” gaseous fuels prep package.
<b>Order Availability:</b>	Ford Ship Through Conversion Kits
<b>Available</b>	Q2, 2013



# Product Overview – School Bus

## Blue Bird Vision

<b>Model Years:</b>	2012 - Newer
<b>Engine Size:</b>	6.8L V10 (3V)
<b>Applications:</b>	Blue Bird Vision Blue Bird MFSAB / Activity Bus
<b>Tank Sizes:</b>	67 usable gallons
<b>Technical Specs:</b>	EPA and CARB Approved Up to 77 Passengers GVWR: 33,000 lbs.
<b>Order Availability:</b>	Blue Bird Dealers



BLUE BIRD



# Product Overview – School Bus

**ROUSH**<sup>®</sup>  
CLEANTECH

## Ford E-450 DRW Cutaway



<b>Model Years:</b>	2009 – 2012
<b>Engine Size:</b>	6.8L V10
<b>Applications:</b>	Dual rear wheel cutaway 5-speed auto transmission
<b>Tank Sizes:</b>	Aft-Axle: 41 usable gallons
<b>Technical Specs:</b>	EPA and CARB Approved Up to 30 Passengers GVWR: 14,500 lbs.
<b>Order Availability:</b>	Blue Bird Dealers





# RETURN ON INVESTMENT

A Positive Return, Even Without  
Government Incentives

# Savings Calculator



## 2012 Ford E-250 Cargo Van

	Gasoline (5.4L V8)	Propane (5.4L V8)	Savings or (Cost) to Convert
<b>Capital Costs</b>			
Base Ford Vehicle Purchase Price	\$ 28,325.00	\$ 28,325.00	
ROUSH Propane System Conversion Price		\$ 11,300.00	
<b>Total Capital Savings or Investment to Convert:</b>	\$28,325.00	\$39,625.00	<b>\$ (11,300.00)</b>
<b>Operating Costs (fuel)</b>			
Total Vehicle Life (miles)	200,000	200,000	
Average Miles per Gallon*	13.0	11.1	
Gallons of Fuel Used Over Life of Vehicle	15,385	18,100	
Fuel Price (per gallon)**	\$ 4.01	\$ 1.51	
<b>Total Fuel Savings or Cost Over Life of Vehicle:</b>	\$ 61,692.31	\$ 27,330.32	<b>\$ 34,361.99</b>
<b>Operating Costs (misc.)</b>			
Maintenance Rate per mile (tune-ups, oil, engine life, etc.)***	\$ 0.030	\$ 0.015	
Maintenance Costs	\$ 6,000.00	\$ 3,000.00	
Fuel Loss from Pilferage & Theft (\$100 per year)	\$500.00	\$0.00	
<b>Total Misc. Savings or Costs Over Life of Vehicle:</b>	\$6,500.00	\$3,000.00	<b>\$ 3,500.00</b>



**Gross Vehicle Lifetime Savings or Loss:** \$37,861.99

**Net Vehicle Lifetime Savings or Loss:** \$26,561.99

# Savings Calculator

## 2012 Ford F-250 Pickup Truck

	Gasoline (6.2L V8)	Propane (6.2L V8)	Savings or (Cost) to Convert
<b>Capital Costs</b>			
Base Ford Vehicle Purchase Price	\$ 35,765.00	\$ 35,765.00	
ROUSH Propane System Conversion Price		\$ 10,500.00	
<a href="#">Federal Alternative Motor Vehicle Tax Credit (propane only)</a>			
<b>Total Capital Savings or Investment to Convert:</b>	\$35,765.00	\$46,265.00	<b>\$ (10,500.00)</b>
<b>Operating Costs (fuel)</b>			
Total Vehicle Life (miles)	170,000	170,000	
Average Miles per Gallon*	12.0	10.2	
Gallons of Fuel Used Over Life of Vehicle	14,167	16,667	
Fuel Price (per gallon)**	\$ 4.01	\$ 1.51	
<b>Total Fuel Savings or Cost Over Life of Vehicle:</b>	\$ 56,808.33	\$ 25,166.67	<b>\$ 31,641.67</b>
<b>Operating Costs (misc.)</b>			
Maintenance Rate per mile (tune-ups, oil, engine life, etc.)***	\$ 0.030	\$ 0.015	
Maintenance Costs	\$ 5,100.00	\$ 2,550.00	
Fuel Loss from Pilferage & Theft (\$100 per year)	\$500.00	\$0.00	
<b>Total Misc. Savings or Costs Over Life of Vehicle:</b>	\$5,600.00	\$2,550.00	<b>\$ 3,050.00</b>

Gross Vehicle Lifetime Savings or Loss: **\$34,691.67**

Net Vehicle Lifetime Savings or Loss: **\$24,191.67**





# Field Service Network



## Demonstration Vehicles

### ROUSH CleanTech Demo Units

- Located around the U.S.
- Vehicles available:
  - E-series Cargo Vans
  - E-series Passenger Vans
  - E-series Cutaway Vans
  - F-series Pickup Trucks
- Contact us for details



# Customer Adoption





## Sales Territories

Strategic Accounts



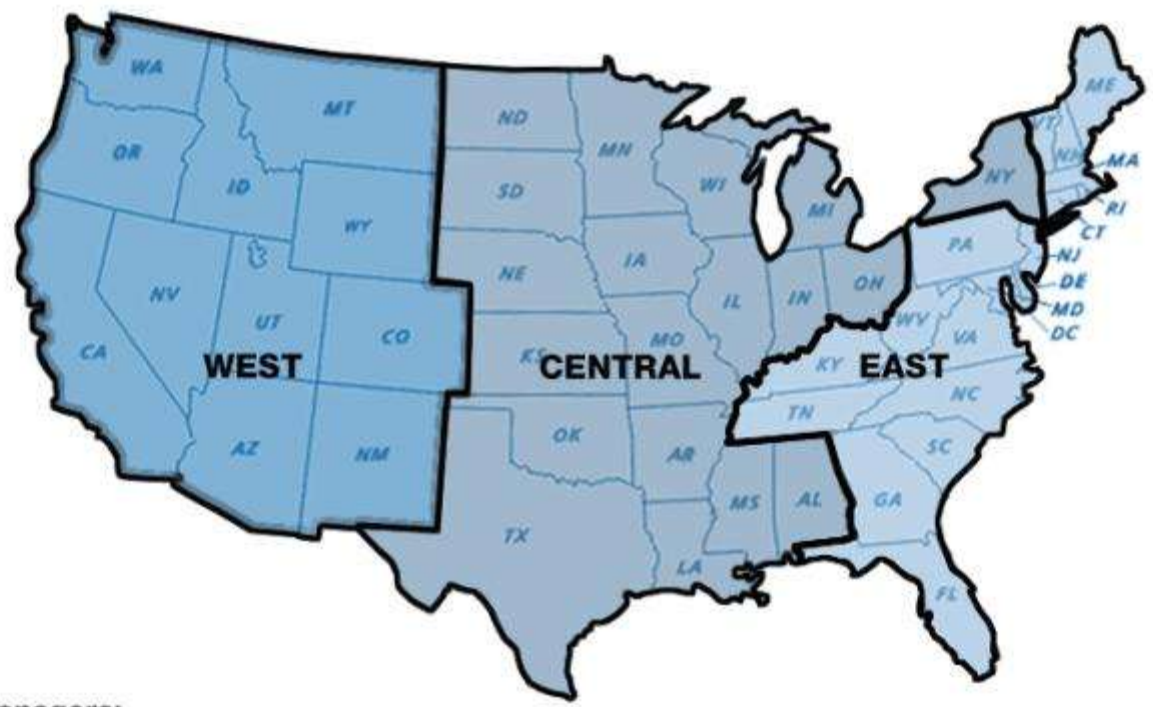
**Territory Managers:**

- West: Eric Bates - 602.989.5086 - eric.bates@roush.com
- East: Peter King - 313.529.8518 - peter.king@roush.com



## Sales Territories

Government / School / Propane



**Territory Managers:**

- West:** Brad Beauchamp - 734.679.2756 - [brad.beauchamp@roush.com](mailto:brad.beauchamp@roush.com)
- Central:** Robert Little - 734.679.7526 - [robert.little@roush.com](mailto:robert.little@roush.com)
- East:** Chelsea Jenkins - 734.812.1965 - [chelsea.jenkins@roush.com](mailto:chelsea.jenkins@roush.com)

10.28.2011



## CONTACT US:

800.59.ROUSH  
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**Todd Mouw**  
Vice President, Sales & Marketing

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Todd.Mouw@roush.com

# LPG as an Alternative Fuel: The King County Experience



V. Melody Bennett  
Fleet Administration Division  
Department of Transportation,  
King County Washington

*September 6, 2012*

# King County Fleet Administration

- Located in Washington state, King County covers an area almost twice the size of Rhode Island (2,307 square miles) and has a population of close to two million.
- King County Fleet Administration manages the acquisition, maintenance, replacement and disposal of more than 2,600 diverse fleet vehicles and equipment for the County government. These support the County's administrative services, and other functions such as public safety, roads, transportation, and parks.



# King County Alternative Fuel Vehicles

- King County has a long history of commitment to the environment and to clean vehicles.
- King County's broad range of equipment types and purposes has lead to its purchase of a wide variety of alternative-fueled vehicles and equipment.

# King County Alternative Fuel Vehicles

## All-Electric Vehicles

- 6 sedans
- 79 low speed EVs

## Propane Vehicles

- 18 LPG vans & pickups

## CNG Vehicles

- 2 sedans
- Former fleet of 271 police vehicles (1995)

## Hybrid Vehicles

- 5 hybrid utility trucks
- 4 plug-in Priuses
- 173 hybrid cars and SUVs



# King County Alternative Fuel Vehicles

The tally of our current alternative fleet is shown in the table below:

Alt Vehicle Category	Sedans & SUVs	Pickups & Vans	Med & Heavy-duty Trucks	Forklifts	Carts & ATVS	Total
Hybrid	177		5			182
LPG		18		20	4	42
CNG	2					2
EL	6			9	70	85
FFV	383					383
<b>Grand Total</b>	<b>568</b>	<b>18</b>	<b>5</b>	<b>29</b>	<b>74</b>	<b>694</b>

# Reasons for Choosing LPG

- Propane systems are seamless to operators – no loss of power, stop start, acceleration – and available in a wide variety of models.
- LPG fueling facilities are widely distributed throughout the region.
- LPG conversions are original equipment manufacturer (OEM) authorized.

# Reasons for Choosing LPG

- The LPG conversions retained their factory warranty.
- With the configuration we chose, there was no loss of storage space/bed space.
- Reportedly, LPG vehicles require less maintenance.

# KING COUNTY'S EXPERIENCE

- Technicians were trained to up-fit and service the LPG units at no cost to the County.
- The LPG suppliers updated the County's fuel storage and dispensing equipment at no cost to the County.

# KING COUNTY'S EXPERIENCE

- The fueling equipment is similar to gas and diesel pumps.
- There are no additional hazards associated with fueling LPG vehicles.
- Fleet has been able to use existing fueling cards with the LPG fueling pumps.

# User Experience

A survey of our drivers confirmed our expectations of the performance of the LPG vehicles

- They found no loss of power or performance.
- Handling was indistinguishable from that of a regular pickup or van.
- The vehicles are reliable.



# User Experience

There was one downside reported by many of our users:

- They had to refuel more often and there were not enough county refueling sites.
- These are issues that we are addressing
  - With the vehicle manufacturer – we chose storage space over larger fuel capacity.
  - With the fuel supplier – we are considering additional county fueling sites.

# Return on Investment

- King County received grant funding to cover the full incremental cost of the LPG units we purchased.
- LPG always costs less than unleaded.
- Fleet Administration received a 50 cent per gallon rebate for the LPG used in 2011
- The financial experience has been consistent with our projections.

# Future Plans

- King County Fleet Administration has been satisfied with the performance of the vehicles.
- We are looking for opportunities to include more LPG units in our fleet as old vehicles are retired and funding is available.



**QUESTIONS?**

Thank you for joining us!