

Integrating
Medium and
Heavy Duty
Natural Gas
Vehicles into
Your Fleet



or...
Rome wasn't
built in a day....

7/24/2018
Tracy Ochsner

Who and Where are we?

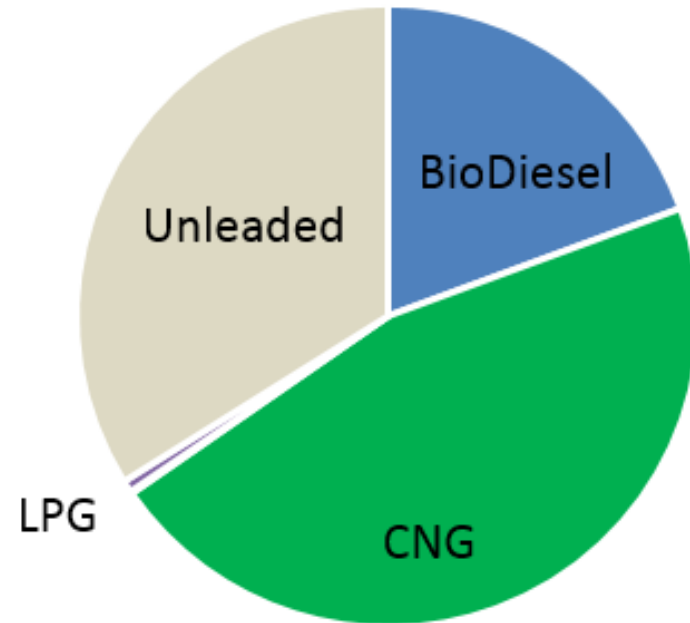


- 50 miles North of Denver
- Population 170,000
- 4 Maintenance Shops
- 3 Natural Gas Fuel Sites
- 43 Fleet Employees
- Annual Budget – \$10.8 m
- ~1,000 On-road Vehicles

2017 Fuel Consumption

BIODIESEL	202,130
CNG	479,217
PREMIUM DIESEL	1,159
Propane	6,448
UNLEADED	353,388

2017 Fuel Usage



Municipal and Community Greenhouse Gas Goal

- Reduce the City's Greenhouse Gases 20% by 2020
 - Baseline year is 2005
 - Does not account for growth
 - 80% reduction by 2030
 - Carbon Neutral by 2050



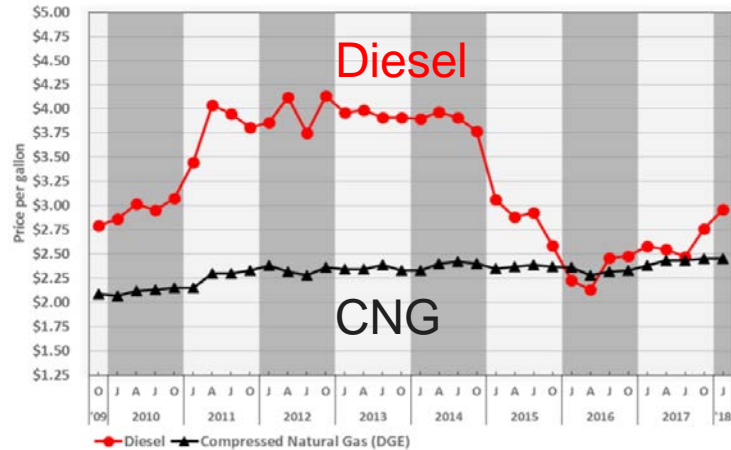
Vehicle Purchasing Policy

- Will purchase an alternative fueled vehicle if:
 - Fueling infrastructure is in place
 - Job application fits the type of factory-equipped vehicle available
 - Economics are beneficial to the City
 - Vehicle meets the operational needs of the dept.

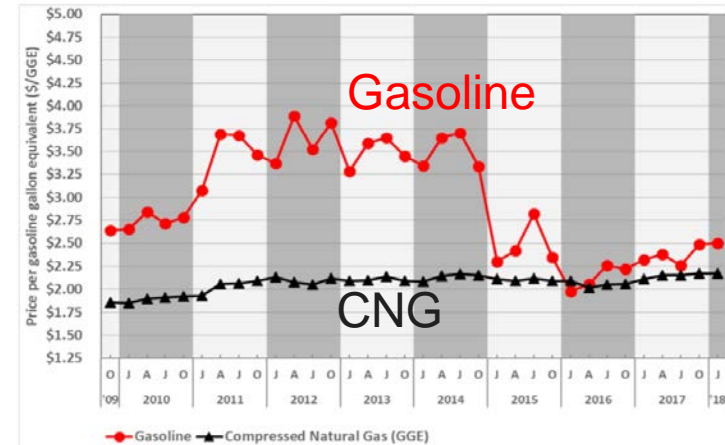


Why is CNG important

- Cleaner Burning
- Domestically Produced
- Price Stability



Pricing
since
2010



You have to start somewhere...



...we started in the late 80s

Fueling Infrastructure

We started with a small compressor and basket of bottles.



Fueling Infrastructure

Then moved into slow-fill “Fuelmaker” appliances



Cost - \$25,000 Installed (1998)

3.7 gasoline Gallon Equivalent / hr

Easy to hookup

Not real easy to meter



Then as we talked about buying buses, we were ready to build a Fast-fill fuel site.



- but could only afford the essential components



Compressor



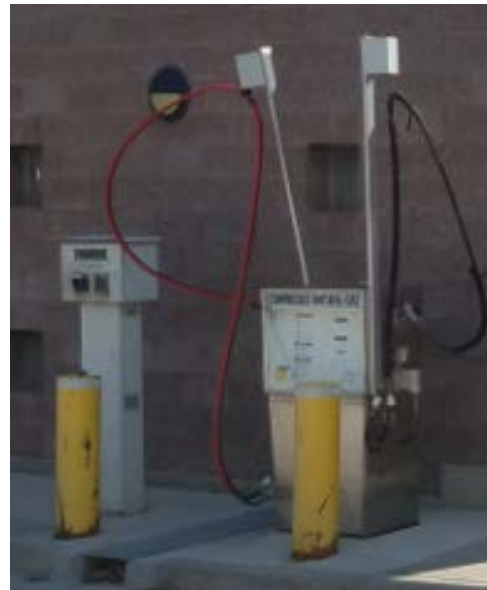
Storage Tubes

Fueling Infrastructure

This site cost about \$380k in early 2000.



Dryer



Dispenser and
Card Reader

Fueling Infrastructure

Then we added more compression (backup) and additional dispensers as we could afford to - total cost with the upgrades ~\$750k



35 PSI inlet pressure = 4 gallons per minute

Fueling Infrastructure

As we started buying trucks and pickups, we built another small site in 2016.
Cost ~ \$250k (used but decent equipment)



20 PSI = 4 gallons per minute (storage) then ½ gallon per minute or wait about an hour

...and finally we built our ultimate site for about \$850k.



500 PSI inlet pressure = over 10 gallons per minute

Fueling Infrastructure



In the meantime, we slowly started adding vehicles as our fueling infrastructure grew



41 – Transit Buses



4 Tractors (semi's)



12 – Tandem Trucks



8 - Medium duty pickups



Bucket Truck



Flusher Truck



Chipper Truck



Cone Truck



Zamboni



This is where you get to be creative!!!! If the engine and chassis is a good fit for the application, you should be able to find tank locations.

Grapple Truck



CNG Maintenance Shop upgrades

Be strategic -
Every bay in
every shop does
not need to be
upgraded

U.S. DEPARTMENT OF
ENERGY Office of ENERGY EFFICIENCY
& RENEWABLE ENERGY

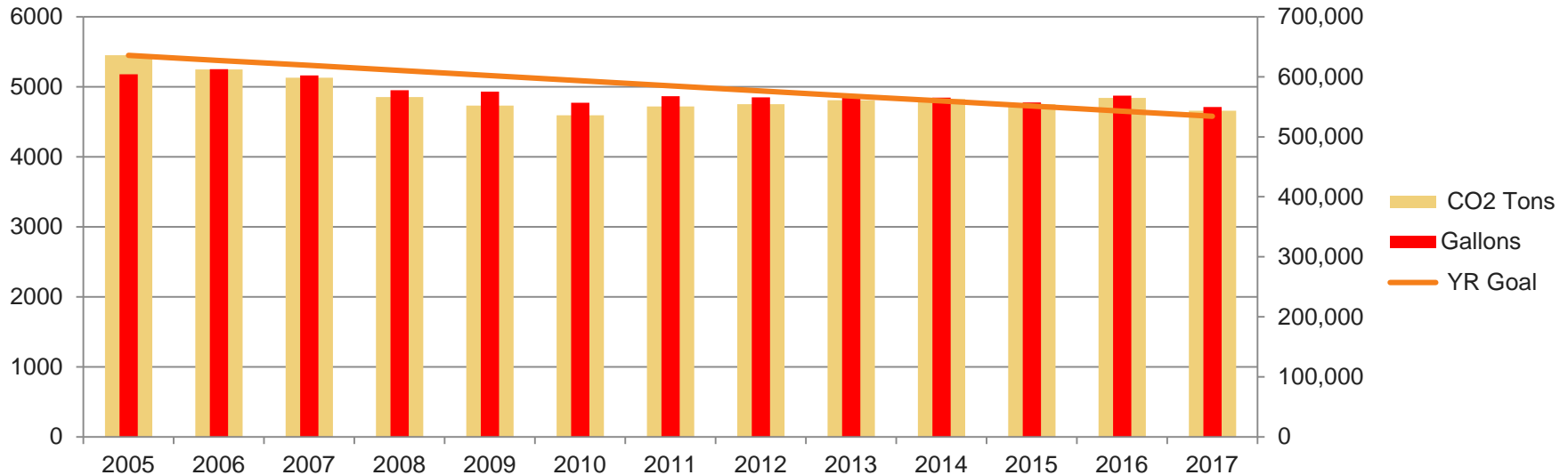
Compressed Natural Gas Vehicle Maintenance Facility Modification Handbook



September 2017

Understand
the difference
between a
minor and
major CNG
repair facility

CO2 and Fuel Qty per Year





- 2012 - 29th
- 2013 - 55th
- 2014 - 72nd
- 2015 - 47th
- 2016 - 33rd
- 2017 - 14rd
- 2018 - 12th



- 2012 - 22nd
- 2015 - 16th
- 2016 - 16th
- 2017 - 7th



2016 – top 50

2017 – 13th

2018 – 10th





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