

# **CITY OF NORMAN ALTERNATIVE FUEL PROGRAM**



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**Prepared by Mike White  
Fleet Superintendent  
Department of Public Works**

## **ALTERNATIVE FUEL PROGRAM**

### **EXECUTIVE SUMMARY**

The City of Norman seeks to be a leader in the implementation of alternative fuel technology. The City's goal is to increase the usage of alternative fuel vehicles (AFVs) each year as technology allows while monitoring each new technological advancement to suit the application and departmental needs. Currently, the capital costs for AFVs are greater than conventional vehicles. In addition, some alternative fuels are also more expensive than conventional unleaded or diesel fuels. The projected budget increase for the alternative fuel vehicle purchases may exceed \$90,000 in FYE 2009. In contrast, the projected savings in fuel costs is estimated to be \$21,000, or 1.1 percent of the total projected FYE 2009 fuel budget of \$2,052,500.

It is recommended that the City purchase three types of Alternative Fuel Vehicles (AFV) in FYE 2009: (1) Compressed Natural Gas (CNG) vehicles, (2) Flex Fuel vehicles, and (3) B-20 biodiesel fuel capable vehicles. If the City actively pursues these AFV options, an expanded alternative fuel infrastructure must be developed either as a city-owned facility or in partnership with other agencies in Norman. Capital improvements needed for the alternative fuel infrastructure will be costly. Currently, the City has 14 Flex Fuel, 6 CNG, and 16 B-20 biodiesel capable vehicles and equipment on order. In addition, two new City-owned fueling options are being considered this year including (a) B-20 biodiesel fuel for heavy equipment and (b) compressed natural gas (CNG) fuel.

The additional cost for FYE 2010 for alternative fuel vehicles is estimated to be \$230,000. The City's current diesel fuel usage per year is 350,000 gallons at a cost of approximately \$1,065,000. The additional cost to the FYE 2009 fuel budget for B-20 biodiesel fuel at the current rate is estimated to be \$49,000, or a 4.6 percent increase over FYE 2008. The additional unit cost of B-20 biodiesel fuel based upon recent bids will be \$0.14/gal. To minimize the budget impact in FYE 2009, weekly purchases for each product will vary depending upon which option is most cost effective that week. City staff is also pursuing CNG fueling facility options, which range in cost from \$300,000 for "slow fill" to \$1.2 million for "fast fill".

## **BACKGROUND**

Since 2001, the City has purchased compressed natural gas (CNG), flex fuel, and hybrid vehicles.

### Current City Fleet 867 (See attachment for more detailed description)

- 742 Rolling Stock
  - 65 Electric
  - 2 Hybrid
  - 7 CNG
  - 29 Flex Fuel
  - 328 Unleaded
  - 311 Diesel
- 125 Non Rolling Stock
  - 46 Non Fuel
  - 3 Electric
  - 6 CNG
  - 39 Unleaded
  - 31 Diesel

Although the City is not mandated by federal or state regulations to purchase alternative fuel vehicles (AFVs) or use alternative fuels, considerable efforts have been made since 2001 to analyze available alternative fuel vehicle options for City use. The City has made vehicle and equipment purchasing decisions based upon operational issues, fiscal concerns and responsible environmental stewardship.

When selecting AFVs, consideration is given to the end user application and their operational functions since the size and location of fuel tanks impact the storage, functionality and useful bed space of the vehicles. Other issues include availability of fuel supply, ability to refuel without long delays, driving range between fuel stops, vehicle usage by on-call staff including responding to emergency or disaster situations and the availability of original equipment manufacturer (OEM) vehicles.

## **HISTORY OF CITY AFVS**

Of the alternative fuels available since the year 2000 including methanol, liquid natural gas (LNG), compressed natural gas (CNG), and electric, staff focused on CNG as the most viable fuel due to availability, fuel characteristic and original equipment manufacturer (OEM) vehicle availability. In 2001, the City of Norman purchased seven (7) CNG F-150 Ford Trucks with the assistance of the Association of Central Oklahoma Governments (ACOG) Clean Cities Program rebate. In subsequent years the City's AFV program expanded to include two (2) hybrids and twenty-nine (29) flex fuel vehicles. All other vehicles purchased are compliant with new EPA emissions

standards.

The City's current fleet of AFVs was selected based on availability of a local fuel supply and OEM availability. The fleet consists of CNG pickup trucks, hybrid sedans and electric vehicles. City CNG vehicles currently acquire fuel from the Oklahoma Natural Gas (ONG) fueling facility located at 625 North Berry Road at a cost of \$1.01 per gallon. The cost at ONG has remained the same for the last three (3) years. A secondary location is located at the University of Oklahoma Fleet Services located at 2805 S. Jenkins Avenue at a current cost of \$0.73 per gallon. The CNG vehicle purchases have not increased since 2002 due to the lack of a CNG infrastructure and limited technician training. A certified technician is required to work on all CNG vehicles. The City of Norman has two certified technicians and is in the process of increasing the number of certified technicians to at least 50 percent by the end of FYE 2010. Currently, Staff is pursuing the addition of a slow fill CNG infrastructure.

### **CURRENT STATE OF THE INDUSTRY**

The Detroit Auto Show held in January, 2009 provided an indication of the alternative fuel vehicles available in the next several years. The most visible and promoted were hybrid vehicles by all major manufacturers. Several manufacturers debuted plug-in hybrid vehicles that will become available in limited production in 2009. Only one manufacturer continues to produce a dedicated CNG passenger vehicle, Honda Civic. In addition, only one manufacturer produces a hydrogen powered vehicle in limited numbers, also Honda Civic.

According to the Clean Cities Seminar held at Chesapeake Energy Corporation in May, 2008, Oklahoma is the second largest natural gas producer in the United States and the price of natural gas will remain stable without a significant increase in the near future.

CNG continues to be a viable option for medium and heavy duty trucks yet automobile manufacturers have limited production of CNG vehicles. Therefore, after market conversion kits will have to be added to the vehicle by a state certified installation facility in order to maintain existing warranties.

### **FUEL SAVING DEVICES AND ADDITIVES**

Some vendors are promoting these devices and additives. The Federal Trade Commission (FTC) offers a fact sheet regarding these devices and found that even in instances in which such devices provided savings, the savings were minimal. The U.S. Environmental Protection Agency (EPA) has tested more than 100 devices and additives and has not found any that significantly increase fuel economy. Several were found to offer small improvement in fuel economy but also resulted in increased exhaust emissions. Also, installation of these devices may cause engine damage and may be considered illegal tampering (or void vehicle warranty) as cited in the FTC fact sheet mentioned above.

### **RETROFITTING VEHICLES TO OPERATE ON CNG**

The availability of new light-duty OEM compressed natural gas vehicles has declined in recent years; however, it is possible to convert a conventional engine to one that can run on an alternative fuel, such as natural gas. Certified installers can reliably retrofit some light-duty vehicles for natural gas operation. A converted vehicle is one that was originally designed to operate on gasoline or diesel and has been altered to run on an alternative fuel; however, the retrofit comes at a significant additional cost (i.e., the purchaser must pay extra for the retrofit). An after-market conversion may only be performed on a vehicle if a Certificate of Conformity or California Air Resources Board (CARB) certification has been issued for that specific vehicle or engine. The City may direct future purchases and specifications to include these after-market conversions. The average cost of a conversion kit for a light truck is \$15,000, or approximately 75% of the average purchase price for that same truck of \$20,000. On heavy duty trucks up to 60,000 GVW, the average cost of a conversion kit is up to \$50,000 or approximately 45% of the average purchase price for that same truck of \$110,000.

### **FUEL OPTIONS**

**Ultra low sulfur diesel fuel** has a much lower sulfur content (15 ppm) than the previous U.S. on-highway standard for low sulfur diesel (500 ppm), which not only reduces emissions of sulfur compounds but also allows advanced emission control systems to be fitted that would otherwise be poisoned by these compounds. Engines will no longer have to be redesigned to cope with higher sulfur content and may use advanced emissions control systems. The city currently purchases ultra low diesel fuel.

**Low sulfur diesel fuel** combined with diesel engine emission devices continues to be used in most fleets; however, according to the Energy Independence and Security Act of 2007, federal and state mandates in the future will require the purchase of cleaner burning engines to meet emission pollution requirements. When purchasing heavy trucks not available with alternative fuel capabilities, specifications are written to ensure we meet current and future mandates.

**Compressed Natural Gas (CNG)** remains a viable fueling option for our existing CNG light trucks and in our heavy duty refuse vehicles. In regards to CNG vehicles, there is a 40% reduction in drivable miles per tank of fuel. Sanitation trucks may need to adjust their routes to accommodate the smaller fuel tank capacity. CNG requires a separate fueling infrastructure, which the City will need to develop. The current cost analysis of this option for a typical light truck is as follows:

Increased vehicle cost:	\$15,000.00
Annual fuel cost savings:	\$ 2,500.00
Cost recovery period:	6 years

**Propane** remains the fuel of choice for forklifts.

**Liquid Natural Gas (LNG)** was ruled out as a fueling option due to the characteristic of the fuel and the infrastructure requirements.

**Flexible Fuel Vehicle (FFV)** is an alternative fuel vehicle with a multi-fuel engine that can typically use Ethanol/E85 or Unleaded. This continues to be a viable solution for police patrol vehicles.

**Ethanol or E85** is an alternative fuel as defined by the U.S. Department of Energy. E85 is the term for motor fuel blends of 85 percent ethanol and 15 percent gasoline. E85 is designed for use in flexible fuel vehicles (FFVs). Ethanol has 66% of the BTU value of gasoline, lowering the miles per gallon when blended with gasoline. In turn, it takes 1.4 gallons of E85 to do the same work as a gallon of gasoline. The City currently operates some light-duty flexible fuel vehicles. FFVs may operate on either E85 and/or gasoline interchangeably. The City's FFVs are operated with unleaded gasoline, as E85 has limited availability in Oklahoma, and requires a separate fueling infrastructure, which the City would need to develop.

**E10** is a blend of 10 percent ethanol and 90 percent gasoline. It is approved for use in any make or model of gasoline powered vehicle sold in the U.S. Many automakers recommend its use because of its high performance and clean burning characteristics. According to the Department of Energy, a complete tank cleaning by a contractor at an estimated cost of \$2,000 would have to take place before switching underground fuel storage tanks to E10 to eliminate any excess moisture that may exist. Red Rock Distributing Company, the City's fuel provider has listed several positive and negative aspects of E10.

#### Positive

1. Fuel cost may decrease depending on daily market value of unleaded
2. Fuel octane rating increases
3. Harmful gasoline emissions decrease
4. Will not cause long-term engine damage

#### Negative

1. Easily absorbs water from storage tanks
2. Has a shelf life of less than 90 days
3. Acts as a solvent with fuel tanks, lines, pumps and other fuel related equipment.
4. Deteriorates aluminum, plastic, rubber, and some fiberglass due to ethanol's corrosive properties.
5. E10 consistently reduces miles per gallon by 2% to 3%

**Hybrid** vehicles seem to be an interim solution until a more viable AFV is developed. The hybrid vehicle generally obtains an increase in vehicle miles per gallon (MPGs)

while reducing emission at low speeds. The City will purchase hybrid vehicles as replacements in areas where these vehicles can be effectively used. The current cost analysis of this option for a typical medium-sized passenger vehicle is as follows:

Increased vehicle cost:	\$4,000.00
Annual fuel cost savings:	\$ 225.00
Cost recovery period:	18 years

**Plug-in hybrid** vehicles are on the horizon with only limited production of the plug-in hybrids expected in 2009.

**Hydrogen** vehicles are touted as producing no emissions, but will require an expensive fueling infrastructure. A limited number of hydrogen vehicles are being produced in 2009; this AFV is several years away from being a viable option for City vehicles.

**Biodiesel** is a domestic, renewable fuel that can be made from vegetable oils, animal fats, or recycled restaurant greases. Pure biodiesel is known as **B-100** and is considered an alternative fuel. It is not the same as raw vegetable oil. It contains no petroleum, but can be blended with any level of petroleum to create a biodiesel blend. The most common blend is **B-20**, (20% biodiesel and 80% diesel). B-20 can be used in nearly all diesel equipment and is compatible with most storage and distribution equipment without impacting engine warranty. B-20 works as a cleaning agent in diesel systems and may initially cause minor fuel issues such as increased fuel filter replacement needs and cause fuel injectors and pumps to fail, causing more downtime to vehicles. B-20 and lower-level blends generally do not require engine modifications. While B-20 comes with an increased cost, it does reduce the dependency of foreign oil and supports green efforts.

In 2008, the City of Thousand Oaks, California stated that they used B-100 biodiesel at their Hill Canyon Treatment Plant, and experienced issues with low-temperature gelling in the storage tank, which created problems with engine components such as injector pumps, hoses and gaskets in most of the equipment. As a result of the problems experienced with B-100 biodiesel they discontinued its use. We do not believe this is a viable option at this time.

However, City staff does believe B-20 biodiesel will work in our existing diesel fueled equipment except emergency equipment using diesel due to the liability of altering the fuel. Therefore, a separate underground fuel tank and equipment would have to be established in order to fuel emergency equipment with pure diesel.

### **Emerging Fuels**

Staff is staying apprised of the future of the fuel industry. There are many emerging fuels including Bioutanol, Biogas, Biomass to liquids, and gas to liquids, these fuels will

be evaluated as they become more practical. By following the industry and being active in trade organizations, staff will continue to stay informed and keep the City on the forefront of implementation, recommending those fuels that have low environmental impact and are economically and operationally feasible.

### **VOLATILITY OF AFV MARKET**

While staff has prepared and intends to pursue this five-year plan, it is important to note that there is continued uncertainty in the AFV market. The City's experience thus far is that CNG vehicles have been incorporated into the fleet. While many models are no longer available, aftermarket conversion kits can be installed at certified dealers. Many CNG vehicles are expected to be available in the up coming year; electric vehicles have been acquired which are no longer available. Flexfuel and biodiesel fuel are currently under consideration to meet the City's needs. Both of these recent technologies are likely transitional applications until a new fuel is identified. The industry continues to adjust and adapt and the City must do the same as new technologies emerge.

### **RECOMMENDED CAPITAL IMPROVEMENTS**

Capital improvements are costly but the fuel budget will experience immediate savings. Compressed Natural Gas (CNG) in today's market is consistently between 30-50% less per gallon than diesel. The short term capital improvement recommendations are as follow:

(1) Develop compressed natural gas infrastructure to include a "fast fill" station, an on-site pump that allows operators to fuel the vehicles within minutes depending on the storage capacity of the vehicle. It usually fills a vehicle to 75% of its fueling capacity. At a cost of 1.2 million. As an option, a "slow fill" station with five post (2 hose dispensers each) that will fuel up to 10 vehicles, depending on the daily fuel usage can be developed. This is a system designed to fuel vehicles overnight without an operator being present. Usually, this can be accomplished in 8 hours and provides a 95% fill, increasing driving range. Grant programs are being explored. The City may choose to hire a consulting firm to assist with the program and ensure that all available benefits of CNG are realized. The consulting services might include:

1. Writing of proposals for vehicle and infrastructure grant funds to federal, state, or local funding sources.
2. Support and provide explanation on any alternative fuel programs at Council meetings or management meetings when necessary.
3. Provide advice on all types of alternative fuels including possible layout of infrastructure facilities.
4. Advice on the real benefits of using alternative fuels (i.e. cost savings, longer engine life, lower personnel costs, etc.).
5. Seek possible strategic partners to use future fuel infrastructure.



6. Explain the tax benefits of owning natural gas vehicles and infrastructure.
7. Help the City of Norman obtain the \$.50 per gallon fuel credit made available through the Energy Bill.
8. Explain the pros and cons of using LNG vs CNG.
9. Conduct life cycle cost analyses to help justify alternative fuels.
10. Develop component needs, i.e. number of dispensers, compressor sizing, proper dryer, oil filters, etc. along with the location and layout of the station.
11. Provide recommendations on hours of operation and the best way to utilize the City's resources and cut refueling costs.
12. Write performance bid specifications for the fuel infrastructure.
13. Provide preliminary bid package.
14. Evaluate bids received by the City and make recommendations for award.
15. Unlimited phone calls to answer questions concerning alternative fuel issues.

(2) Fuel all Fire trucks at the OU facility at an additional cost of \$0.19/gal. This approach will save staff time and vehicle travel. Currently, fire trucks consume approximately 21,000 gallons of diesel/year. The additional charge of \$0.19/gal will cost \$3,990. At today's cost (\$1.416) plus the markup (\$0.19) the annual fuel charge for Fire would be \$33,730.

(3) A south side fueling station should be developed to reduce the amount of mileage and labor incurred by vehicles housed on the south side of Norman. There would be one automated dispenser for unleaded, one for diesel, and one for biodiesel. At today's cost, this is estimated at \$300,000 if City property is used.

(4) A B-20 biodiesel fuel holding tank will be proposed for FYE 2010 at North Base to fuel non-emergency equipment. Cost estimate is \$150,000.

### **PROPOSED FYE 2009 VEHICLE PURCHASES**

The City of Norman will replace 47 vehicles and equipment in FYE 2009. Of those 47 vehicles/equipment scheduled for replacement, the staff analysis indicates that up to 19 alternative fuel vehicles and 12 flex fuel vehicles could be included. 14 new diesel vehicles will be equipped to operate on biodiesel fuel if that fuel is deemed to be cost effective. 5 CNG light weight trucks will be fueling on compressed natural gas. Thus, 31 vehicles or 66% of the fleet purchases in FYE 2009 could be AFVs.

One notable element of the FYE 2010 vehicle purchase recommendation involves the acquisition of two CNG Sanitation trucks, one for residential collection and one for commercial collection. Very few agencies in the country have purchased these vehicles, so there will be a certain amount of experimentation required for this initiative. We have already requested assistance with these purchases through the ACOG grant. ACOG will notify accepted recipients of the grants by May 2009. These are also expensive, custom vehicles so, once acquired, the Sanitation Division of the Utilities Department will

operate these vehicles for at least 5-7 years before they will be replaced. In summary, FYE 2009 Capital Equipment Replacements might include:

- 14 Biodiesel (B20)
- 5 Compressed Natural Gas (pending funding and availability)
- 12 Flex Fuel capable

The City currently has 82 vehicles and equipment that operate on alternative fuels: 14 CNG (7 generators and 7 light trucks), 2 hybrid sedans, 65 electric golf carts, and one propane forklift. With the purchase of biodiesel fuel in FYE 2009, the number of City vehicles and equipment operating on alternative fuels might increase from 82 to 350, increasing the percentage of City vehicles and equipment operating on alternative fuels to 42%.

#### **OTHER AFV RECOMMENDATIONS:**

- Grants have become available from the Association of Central Oklahoma Governments (ACOG) and Clean Cities. City staff will request grant funds to use toward the purchase of CNG trucks, a CNG Slow Fill unit, and possibly other AFV technologies.
- With the possible FYE 2010 purchases, the City may exceed the goal of converting at least one third of the fleet to AFVs. The City would have 472 AFVs or 54 percent of the fleet of 867 vehicles and equipment by the end of FYE 2009 if biodiesel and E85 fuel become feasible. Each year on average, the City purchases fifty (50) vehicles. At least twenty five (25) of the 50 vehicles purchased each year could be AFV. Where an AFV is not available and a conventional vehicle must be purchased, City staff would ensure the vehicle is right-sized to the job and within the top three most fuel-efficient vehicles available in its class. It is anticipated that the City could add as many as 131 AFVs to the City fleet over the next five years. If biodiesel and E85 fuel become feasible, the City's AFV fleet could increase to 572 AFVs or 66 percent by 2013.
- CNG refuse trucks will refuel at OU Fleet Services or ONG until the City can develop its own CNG fuel infrastructure. For all CNG purchases, grant funds and other federal funding may be available to reduce the cost of CNG vehicles and CNG infrastructure. If the City of Norman owned its own CNG infrastructure and associated vehicles, it appears the city could be entitled to a reimbursement of \$.50/gallon of CNG dispensed, according to the Energy Independence and Security Act (EISA) of 2007. However, the EISA is scheduled to expire December 31, 2009 if Congress does not extend the legislation. President Obama, in a January 27, 2009, Presidential Memoranda, has requested that the National Highway Traffic Safety Administration (NHTSA) publish a final rule on the matter by March 30, 2009, according to [whitehouse.gov](http://whitehouse.gov). Projections are to have more incentives for Alternative Fuel Vehicles, Staff will monitor the progress.

- While other agencies have experienced increased service and maintenance costs by using B-20 biodiesel, experimentation in this area still appears prudent for the City of Norman. Staff would like to begin purchasing B-20 by early spring of 2009.
- E10 is not a recommended fuel option because it would increase the amount of gallons purchased and consumed. Focusing more on the City's Fuel Conservation Policy adopted in 2009 appears to be a better strategy for the city fleet in terms of fuel conservation and cost savings.
- Flexfuel vehicles are recommended as replacements in areas where these vehicles can be effectively used.
- The City of Norman will collaborate with the University of Oklahoma Fleet Services Division and Oklahoma Natural Gas Company for temporary CNG fueling facilities along with other fueling options until the City is able to develop its own south side fueling facility and enlarge its fuel infrastructure.

### **ACTION PLAN**

#### January 2009

- City staff submits FYE 2010 budget request for CNG infrastructure, South Side fueling station, and other AFV initiatives

#### February 2009

- Council adopts Alternative Fuel Program
- Submit ACOG grant application (Feb 27, 2009)
- Order 6 light duty CNG trucks

#### March 2009

- Solicit proposal for grant consultant
- Order B-20 biodiesel at North Base – begin fueling all emergency diesel equipment at OU Facility.

#### May 2009

- Consulting firm retained to develop CNG grant applications and design of fuel infrastructure with available funding
- Delivery of 6 CNG light duty CNG trucks ordered in February

#### June 2009

- Solicit bids for CNG Refuse vehicles

#### July 2009

- Solicit bid for CNG Infrastructure

August 2009

- Purchase two (2) CNG vehicles for Sanitation
- Solicit bids for underground B-20 biodiesel tank at North Base in February 2010

October 2009

- Start construction on CNG Infrastructure

November 2009

- Order FYE 2010 light to medium duty CNG vehicles

January 2010

- Finish Construction of CNG Infrastructure

February 2010

- Both CNG Sanitation vehicles delivered

April 2010

- Delivery of FYE 2010 light to medium duty CNG vehicles

**CURRENT CITY FLEET**

- 128 Sedans
  - 2 Hybrids
  - 126 Unleaded
- 117 Light Duty Pickups
  - 7 CNG
  - 29 Flex Fuel Capable
  - 81 Unleaded
- 34 Light Duty Utility Vehicles
  - 34 Unleaded
- 20 Vans
  - 19 Unleaded
  - 1 Diesel
- 1 Emergency Response Light Duty
  - 1 Unleaded
- 6 Emergency Response Heavy Duty
  - 6 Diesel
- 9 Emergency Response Pumper
  - 9 Diesel
- 12 Heavy Duty Trucks
  - 2 Unleaded
  - 10 Diesel
- 2 Aerial Lift
  - 1 Unleaded
  - 1 Diesel
- 27 Dump Trucks
  - 27 Diesel
- 3 Wreckers
  - 1 Unleaded
  - 2 Diesel
- 8 Sanitation Front Loader
  - 8 Diesel
- 11 Sanitation Rear Loader
  - 11 Diesel
- 13 Sanitation Side Loader
  - 13 Diesel
- 4 Container Hauler
  - 4 Diesel
- 2 Dumpster Mover
  - 2 Diesel
- 9 Support Equipment Front Loader
  - 9 Diesel

- 1 Chip Collection Truck
  - 1 Diesel
- Oil Distribution Truck
  - 1 Diesel
- 2 Pot Hole Patcher
  - 2 Diesel
- 3 Sweeper
  - 3 Diesel
- 2 Fogger
  - 2 Unleaded
- 1 Trench Burner
  - 1 Diesel
- 14 Back Hoe
  - 14 Diesel
- 3 Excavator
  - 3 Diesel
- 2 Forklift
  - 2 Unleaded
- 1 Dozer Crawler
  - 1 Diesel
- 23 AG Tractor
  - 23 Diesel
- 83 Utility Cart
  - 65 Electric Golf Carts
  - 9 Unleaded
  - 9 Diesel
- 9 Air Compressor
  - 1 Electric
  - 5 Unleaded
  - 3 Diesel
- 19 Generator
  - 6 Natural Gas
  - 11 Unleaded
  - 2 Diesel
- 5 Grader
  - 5 Diesel
- 1 Paver
  - 1 Diesel
- 7 Skid Loader
  - 7 Diesel
- 3 Sweeper
  - 3 Diesel

- 3 Broom
  - 3 Diesel
- 8 Street Roller
  - 1 Unleaded
  - 7 Diesel
- 3 Trencher
  - 1 Unleaded
  - 2 Diesel
- 3 Line Remover
  - 3 Unleaded
- 20 Pumps
  - 20 Unleaded
- 69 Mower
  - 26 Unleaded
  - 43 Diesel
- 1 Stump Cutter
  - 1 Diesel
- 1 Tree Spade
  - 1 Unleaded
- 4 Chipper
  - 4 Diesel
- 1 Sod Cutter
  - 1 Diesel
- 1 Compost Turner
  - 1 Diesel
- 6 Sprayer
  - 3 Unleaded
  - 3 Non Fuel
- 252 Miscellaneous Support Equipment (Spreaders, Trailers, etc)
  - 1 Electric
  - 18 Unleaded
  - 26 Diesel
  - 207 Non Fuel

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**Total:**

- 742 Rolling Stock
  - 65 Electric
  - 2 Hybrid
  - 7 CNG
  - 29 Flex Fuel Capable
  - 328 Unleaded
  - 311 Diesel

- 125 Non Rolling Stock
  - 46 Non Fuel
  - 3 Electric
  - 6 CNG
  - 39 Unleaded
  - 31 Diesel

**Considerations:**

1. What are the City's priorities for the Alternative Fuel Program?
  - (i) Environmental stewardship
  - (ii) Cost savings
2. How ambitious should the City of Norman be with its Alternative Fuel Program?
  - (i) Adopt Alternative Fuel Program.
  - (ii) Purchase B-20 biodiesel.
  - (iii) Purchase diesel fuel at OU Facility for Emergency equipment.
3. Asking for funding to support grant consultant for further funding opportunities.
4. Continue to purchase CNG vehicles and equipment, if applicable.



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