# City of Grand Island

## Tuesday, January 17, 2006
## Study Session

# Item -1

## Presentation of Alternative Fuel Report

***Paul Briseno, Assistant to the City Administrator will present an Alternative Fuel Report.***

**Staff Contact: Paul Briseno**

# ALTERNATIVE FUEL REPORT

City of
Grand Island

2005

# Executive Summary

## Background

The United States dependence of imported petroleum and increased prices has created a need for further use of domestic fuels and fuel flex vehicles.

A report of alternative fuels and fuel flex vehicles was requested on behalf of the City of Grand Island Council by Mayor Jay Vavricek in September 2005. This report is written to help the City Council set policy direction for the procurement and use of fuel and vehicles within the municipal fleet.

The City of Grand Island municipal fleet of petroleum burning vehicles includes over 300 units. In the Fiscal Year 2004-05 the municipal fleet consumed 259,904 gallons of fuel, of which E10, regular unleaded, biodiesel, and regular summer/winter diesel were used.

## Findings

Information provided within this document was made available through case studies, communities throughout the U.S., city staff, industry and governmental reports.

Ethanol and Biodiesel fuel created from domestically grown crops provide an alternative fuel source that has proven to provide superior results. Alternative fuels contain characteristics that are more environmentally friendly than regular petroleum products.

Alternative fuels and fuel flex vehicles offer the City of Grand Island a resource for obtaining optimal operating efficiency of the municipal fleet. Alternative fuels decrease the dependence of foreign fuels and increase agriculture prices that directly impacts Grand Island with added economic value.

## Conclusion

The City of Grand Island Administration recommends the municipal fleet utilize alternative fuels and obtain fuel flex vehicles when possible. The utilization of alternative fuels will provide optimal operation and longevity of the municipal fleet. The future environment of our city will be enhanced with the consumption of these fuels.

# Alternative Fuel Report
## for
# The City of Grand Island Municipal Fleet

The United States demand for fossil fuel from domestic and foreign producers and the increase in fuel prices have amplified the awareness and need of alternative fuels. The United States Government has recognized benefits of ethanol based fuels and biodiesel as well as the impacts fuel flex vehicles have on our environment. In 1990 Clean Air Act Amendments were made to the 1970 Clean Air Act to improve nationwide air quality. These initiatives set emissions standards for stationary and mobile sources as well phased lead in gasoline. Congress passed the Energy Policy Act in 1992 in efforts of enhancing our nation's energy security and improving environmental quality. The oil industry has redefined petroleum in the past 20 years to create a more efficient fuel, however the United States Department of Energy states that the average vehicle emits more than 600 pounds of pollution into the air each year which include carbon monoxide, volatile organic compounds, particulate matter, oxides of nitrogen, and carbon dioxide

In November 2005, the United States dependence of imported petroleum was 68.6% or 13,887,000 barrels of crude oil per day with an average price per barrel of OPEC oil at $50.28. Nebraska currently has access to renewable resources derived from corn and soybeans. These resources ease the necessary dependence of foreign oil. These fuels when utilized can produce more efficient emissions, greater lubricity, enhance environment, increase jobs and provide a positive economic impact for the greater part of Nebraska and the Central Untied States.

To better understand the multiple fuels discussed throughout this document it is important to understand the basics of fuel and from where the Untied States fuel is derived. A barrel of crude oil consists of 42 gallons of liquid and makes multiple by-products. The following table describes what products are produced from a barrel of crude oil. These products have a total volume of 44.6 gallons of which 2.6 gallons are generated from process gains.

### Products produced from a barrel of crude oil

| Product | Gallons per Barrel | Percentage |
|---|---|---|
| **Gasoline** | **19.4** | **43.50%** |
| **Distillate Fuel Oil** | **9.7** | **21.75%** |
| **Kerosene - Type Jet Fuel** | **4.3** | **9.64%** |
| **Coke** | **2** | **4.48%** |
| **Residual Fuel Oil** | **1.9** | **4.26%** |
| **Liquiefied Refinery Gases** | **1.9** | **4.26%** |
| **Still Gass** | **1.8** | **4.04%** |
| **Asphalt and Road Oil** | **1.4** | **3.14%** |
| **Petrochemical Feedstock** | **1.1** | **2.47%** |
| **Lubricants** | **0.5** | **1.12%** |
| **Kerosene** | **0.2** | **0.45%** |
| **Other** | **0.4** | **0.90%** |

According to the American Petroleum Institute, much of the imported fuels are obtained from the Organization of Petroleum Exporting Countries (OPEC) at a rate of 47.6% of the U.S. imports. Persian Gulf countries account for 20.8% of all imports. The following table details imports for July 2005.

**Estimated Crude and Products Imports to the U.S. from Leading Supplier Countries**

| | | July Imports (1000 barrels per day) | % of Total Imports | % of Domestic Product Supplied |
|---|---|---|---|---|
| 1 | Canada | 1,897 | 15.2% | 9.1% |
| 2 | Saudi Arabia | 1,689 | 13.6% | 8.1% |
| 3 | Venezuela | 1,596 | 12.8% | 7.7% |
| 4 | Mexico | 1,279 | 10.3% | 6.1% |
| 5 | Nigeria | 1,156 | 9.3% | 5.5% |
| 6 | Iraq | 615 | 4.9% | 2.9% |
| 7 | Russia | 587 | 4.7% | 2.8% |
| 8 | Algeria | 535 | 4.3% | 2.6% |
| 9 | United Kingdom | 392 | 3.1% | 1.9% |
| 10 | Virgin Islands | 319 | 2.6% | 1.5% |
| | Other | 2,393 | 19.2% | 11.5% |
| | **Total** | **12,458** | **100.00%** | **59.7%** |
| | **OPEC Countries** | **5,925** | **47.6%** | **28.4%** |
| | **Persian Gulf Countries** | **2,589** | **20.8%** | **12.4%** |

This Alternative Fuel Report was developed by researching case studies, industry reports, governmental reports, communities throughout the U.S., and city staff. This report will lend guidance and provide policy direction for current and future use of the municipal fleet and services.

## *Ethanol*

Ethanol is an alcohol made from renewable domestic resources with a process of fermentation/distillation of plant sugars. Other products that produce ethanol include wood waste, cheese whey, sucrose, potato waste, brewery waste, and food and beverage wastes. A variety of highly valued feed co-products, including gluten meal, gluten feed and dried distillers grains, are produced from the remaining protein, minerals, vitamins and fiber. These byproducts are sold as a high-value feed for livestock.

According to Renewable Fuels Association, there are currently 94 ethanol plants that have a combined production capacity of 4.2 billion gallons a year. There are 30 more plants as well as nine expansions under construction that will have a combined annual capacity of 1.5 billion

gallons of ethanol. Chief Ethanol Fuels of Hastings was the first ethanol plant in Nebraska and began processing in 1985. Today, Nebraska is the third largest ethanol producer with 11 plants and the capacity to extract 520 million gallons of ethanol per year. The Unites States produces nearly two billion gallons of ethanol a year. Modern ethanol plants produce 15% more ethanol from a bushel of corn and use 20% less energy compared to plants five years ago. One bushel of corn (approximately 56 pounds) produces 2.7 gallons of ethanol. Nebraska is suited well for ethanol production due to its large corn crop, central location and competitive rail transportation. The growth within the ethanol industry has created a new market for nearly one-third of Nebraska's corn production, creating a combined annual output value of $1,200,000,000, 4,000 jobs with an average salary of $42,000 and a combined annual payroll that exceeds $36,000,000.

During April of 2005, 68% of all fuel sold in Nebraska contained 10% or more ethanol. Of the 63.9 million gallons of gasoline sold in the state during the month, 43.3 million gallons contained ethanol and 20.6 million gallons were regular unleaded gasoline.

Many countries have made ethanol a top priority in their energy plan. The following table lists these countries. Brazil is the number one country with demand and supply of ethanol.

**WORLD FUEL ETHANOL TRADE**
**(billion gallons)**

| COUNTRY | 2003 | 2005 | 2010 |
|---|---|---|---|
| **SUPPLY** | | | |
| Brazil | 3.8 | 4.2 | 5.6 |
| USA | 2.8 | 3.5 | 5 |
| EU | 0.5 | 1 | 1.9 |
| Other | 0.2 | 0.9 | 3.4 |
| Total | 7.3 | 9.6 | 15.9 |
| | | | |
| **DEMAND** | | | |
| Brazil | 3.4 | 3.7 | 4.6 |
| USA | 2.8 | 3.5 | 5 |
| Canada | 0.1 | 0.2 | 0.4 |
| EU | 0.4 | 1.3 | 3.4 |
| Japan | 0.2 | 0.5 | 1.9 |
| Other | 0.4 | 0.4 | 0.6 |
| Total | 7.3 | 9.6 | 15.9 |

The U. S. Department of Energy Laboratory indicates a 38% gain in the overall energy input/output equation for the corn-to-ethanol process. This equates to 100 British Thermal Unit (BTUS) of energy used to plant corn, harvest the crop, transport it, therefore, 138 BTU's of energy is available in the fuel produced. Improved corn yields over the past 20 years have made production less energy intensive.

Ethanol's positive characteristics as an alternative fuel include the following:

- Enhances engine performance by increasing octane and raising oxygen levels
- Cleans and prevents engine deposits
- Reduces carbon monoxide emissions by 22%
- Reduces greenhouse gases that cause global warming by 40%
- Acts as a gas line antifreeze

- 100% ethanol is biodegradable
- Increases the values of feed grains and promotes energy independence

## *E10 (Supra)*

E10 unleaded is a blend of 10% ethanol and 90% ordinary unleaded gasoline. Every major car maker in the world approves the use of 10% ethanol blends (E10 unleaded) in their engine warranty. Almost all post-1986 vehicles can operate satisfactorily on E10.

E10's positive characteristics as an alternative fuel include the following:

- Enhances engine performance
- Cleans and prevents engine deposits
- Cleans rust and contaminates within the fuel tank
- Adds two to three points of octane to gasoline
- Contributes to a more complete fuel combustion
- Reduces greenhouse gas emissions by 12 – 19%
- Reduces carbon monoxide 25%
- Prevents the build-up of power-robbing deposits in fuel injection systems
- Contains many elements of 100% ethanol

In 2004, ethanol use in the U.S. reduced greenhouse emissions by 7.03 million tons.

Manufacturers of small engines and power equipment have built their products to run on E10. The equipment list for small engines companies that warranty E10 is endless and covers everything from motorcycles to mowers. The chart at the right confirms equipment and engine manufacturers' approval of the use of E10 unleaded with ethanol. An operable year for small engines to use E10 has not been established.

| Power Equipment | E-10 Unleaded Approval |
|---|---|
| Am. Yard Prd./Roper/Rally | YES* |
| Ariens | YES† |
| Bolens/Try-Bilt | YES* |
| Briggs & Stratton | YES |
| Coleman | YES* |
| Cub Cadet | NM |
| Dixon | YES |
| Echo | YES |
| Grasshopper | NM |
| Homelite | YES |
| Honda Power Equipmnet | YES |
| John Deer (4-Stroke) | YES |
| Kawasaki | YES |
| Kohler | YES |
| Kubota | NM |
| Lawnboy | YES |
| McCulloch | YES* |
| MTD | YES |
| Onan | YES* |
| Poulan/Weedeater | NM |
| Ryobi | YES* |
| Sears | YES* |
| Shindalwa | NM |
| Simplicity | YES |
| Snapper | NM |
| Stihl Inc. | YES |
| Tecumseh | YES* |
| Toro | YES |
| **Recreational** | |
| ArticCat (Arctco) | YES* |
| Honda | YES |
| Kawasaki | YES |
| Polaris | YES* |
| Skidoo/Bombardier | YES |
| Suzuki | YES* |
| Yamaha | YES |
| **Boats/Marine** | |
| Honda | YES |
| Kawasaki | YES |
| Mercury | YES* |
| OMC (Johnson/Evenrude) | YES* |
| Pleasurecraft | YES* |
| Tigershark (Arctco) | YES* |
| Tracker | YES* |
| Yamaha | YES* |

In January of 2005 the American Coalition for Ethanol conducted a Fuel Economy Study comparing performance and cost of various ethanol blends and standard unleaded gasoline. This scientific study left minor marginal room for human error and resulted in the following:

1. The vehicles tested with E10 performed at 1.5% less mileage per gallon compared to unleaded fuel.
2. With the cost of ethanol lower than the cost of unleaded gas, although MPG of ethanol was slightly lower, the **cost per mile of operation** was generally lower when using ethanol blends.

The conclusion of this study stated that while vehicles using concentrations of ethanol higher than 10% operated normally during tests**, the American Coalition for Ethanol cannot recommend using ethanol blends with higher concentrations of ethanol than those recommended by the vehicle's manufacturer.**

The following chart is from the study and illustrates the actual mileage.

**Miles Per Gallon**

| Fuel | 05 Chevy Impala 3.4 L | 05 Toyota Camry 4 cly | 05 Ford Taurus 3.0 L | Average | Variance |
|---|---|---|---|---|---|
| Unleaded | 27.714 | 31.455 | 24.810 | 27.993 | |
| E10 | 27.426 | 31.464 | 23.851 | 27.580 | -0.015 |

**Cost Per Mile**

| Fuel | 05 Chevy Impala 3.4 L | 05 Toyota Camry 4 cly | 05 Ford Taurus 3.0 L | Average | Variance |
|---|---|---|---|---|---|
| Unleaded | 0.072 | 0.063 | 0.080 | 0.071 | |
| E10 | 0.070 | 0.061 | 0.081 | 0.070 | -0.011 |

**MIles Per $20**

| Fuel | 05 Chevy Impala 3.4 L | 05 Toyota Camry 4 cly | 05 Ford Taurus 3.0 L | Average | Variance |
|---|---|---|---|---|---|
| Unleaded | 0.072 | 0.063 | 0.080 | 0.071 | |
| E10 | 0.070 | 0.061 | 0.081 | 0.070 | -0.011 |

| Fuel | Net Cost |
|---|---|
| Unleaded | 1.598 |
| E10 | 1.082 |

E10's negative characteristics as an alternative fuel include the following:

- May loosen rust and contaminants in fuel tanks
- May clog of the fuel filter
- Vehicles with fuel systems 15 years or older or vehicles pre-1986 are not recommended for the use of E10
- A decrease of fuel performance of 1.5% less mileage per gallon can be expected compared to regular unleaded

## *E85*

E85 unleaded is a blend of 85% ethanol and 15% ordinary unleaded gasoline. The U. S. Department of Energy has defined E85 as an alternative fuel

E85's positive characteristics as an alternative fuel include the following:

- Highest oxygen content of any transportation fuel available (105)
- Burns cleaner than gasoline
- Cost is comparable to unleaded gasoline
- Emits fewer exhaust emissions
  - Reduction of carbon dioxide (CO2)
  - Reduction of hydrocarbon and benzene emissions
- Reduces the production of smog
- Creates a decline in respiratory illness associated with poor air quality
- Increase power of 3% to 5%
- Contains many elements of 100% ethanol

The following is the method for producing E85:

1. 100% Ethanol is produced at an ethanol production facility. Prior to transporting, the ethanol must be **denatured**.
2. The denatured ethanol is transported to the fuel supplier.
3. Denatured ethanol is dispensed into the fuel supplier's ethanol storage tank.
4. A fuel carrier orders a tanker full of E85.
5. The fuel supplier dispenses 8.5 parts denatured ethanol to 1.5 parts unleaded gasoline into the tanker truck.
6. The fuel carrier delivers E85 to the retail fuel marketer for sale to the public.

*Denatured refers to the required "poisoning" of ethanol before it leaves the production plant. Typically this is done by blending in 5% gasoline.

In Grand Island there are two current locations to purchase E85, Aurora Cooperative and Pump and Pantry #3. E85 requires special materials needed to convert a regular unleaded pump/tank to an E85 pump/tank. If the following criteria for E85 are not followed by the retailer the user could contaminate the purchaser's vehicle's system. Contamination deposits can cause pitting of cylinder walls as well as cause poor vehicle handling. The following criteria must be met:

1. All aluminum products must be removed from a typical gasoline dispensing system.
2. Natural rubber, polyurethane, cork gasket material, leather, polyvinyl chloride (PVC), polyamides, methyl-methacrylate plastics, and certain thermo and thermoset plastics can not be used in the fueling process.
3. In cold weather, more gasoline is added to the blend to avoid starting problems. Regular gasoline uses a similar process during winter months. Also at low temperature (32ºF), E85 vapor is more flammable than gasoline vapor.

4. Only metal underground storage tanks that meet EPA December 1998 codes can be used to store E85.
5. Fiberglass storage tanks manufactured prior to 1992, **MAY NOT** be able to handle E85.
6. Tanks must be cleaned prior to holding E85. This process includes:
    a. Using a "filter agitator" device.
    b. Physically entering the tank and steam clean the sludge.
    c. Using robotic cannon to liquefy the sludge. The sludge is then pumped out of the tank and disposed of at an approved site.
    d. Placing a chemical cleaner in the tank to clean the walls.

**Vehicles that use E85 will experience a 5% to 15% drop in fuel economy**. This will vary based on temperature and driving conditions. The range of any vehicle is dependent on the size of the fuel tank and driving habits. The 2006 Ford Taurus, standard model will get 20mpg city/ 27mpg hwy and its fuel flex model (same price) will get 19mpg city/27 mpg hwy, according to the Ford Motor Company.

E85's price per gallon has dramatically increased over the past few months because the value of the finished product has increased. E85 will typically follow the trends of unleaded and E10 fuels. The final per gallon cost of E85 is a process with many steps that add a margin to the retail sale price. According to the Nebraska Ethanol Board the process is as follows: Plant A sells to a marketing company from IL; this company provides Oil Company B ethanol for NE sales; Oil Company B sells ethanol to Wholesale Company C; Wholesale Company C sells to Branded Retailer D, who adds a margin and sells at retail.

Generally, E85 is priced to be competitive with 87 octane gasoline. The blender of record receives a tax credit on every gallon of ethanol he/she purchases thus being able to pass that savings along their retailer who will pass the savings along to the customer. E85 can be more competitive with the federal government's 50 cent per gallon production credit.

<u>E85's negative characteristics as an alternative fuel include the following:</u>

- Only applicable in approved Fuel Flex Vehicles (FFV) or Alternative Fuel Vehicles (AFV)
- Use in non-approved vehicles will void the manufacture's warranty
- Very corrosive
- CO2 is released during ethanol production and combustion, but recaptured as a nutrient
- Fuel parts must be tolerant to alcohol
    - Parts include many metals and rubbers throughout the fuel system
- Fuel performance of 5% to 15% less mileage per gallon compared to regular unleaded
    - Needs more fuel per pound of air than gasoline

The following table is provided by the United States Department of Energy and breaks down the costs, government incentives, and the final pump price for E85 compared to unleaded fuel. This table is based on a summer blend of E85. A similar table is available for winter blend and can be viewed at http://www.e85fuel.com/pdf/ethanol_guidebook.pdf. Winter and Summer blending of E85 is a process that is similar to the blending of regular unleaded fuel for the multiple weather conditions.

# Appendix C: Pricing Sheet - Summer Blend

**National Ethanol Vehicle Coalition**
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email: nevc@e85fuel.com web: www.e85fuel.com

This worksheet has been prepared to illustrate the use of the federal tax incentives that are available to promote the use of E85 as a form of alternative transportation fuel by providing federal income tax credits. These credits assist in reducing the price of E85 to a level that is often very competitive with the price of regular unleaded gasoline. This example is based on information and experience that has been accumulated by the NEVC while working with tax advisors, the IRS, ethanol producers, and fuel marketers.

## Explanation of E85 Pricing for *Summer Blend*

85% ethanol and 15% hydrocarbon

### Assumptions:

| | | | |
|---|---|---|---|
| **Number of gallons of fuel** | | **10,000** | **Enter # of gallons to be purchased** |
| **Terminal price of unleaded/gallon** | **$** | ***1.01*** | **Enter local costs in shaded area.** |
| **Terminal price of ethanol/gallon** | **$** | ***1.41*** | **Enter local costs in shaded area.** |
| **Federal excise tax on unleaded/gallon** | **$** | **0.184** | **Set by federal law** |
| **State excise tax on unleaded** | **$** | ***0.20*** | **Enter state tax rate in shaded area.** |
| **Federal excise tax on E85/gallon** | **$** | **0.1295** | **Set by federal law** |

### COST OF E85

Net price from Distributor/Blender

| | | |
|---|---|---|
| Cost of unleaded (15% of total gallons) | $ | 1,515.00 |
| Cost of ethanol (85% of total gallons) | $ | 11,985.00 |
| Federal excise tax on E85 | $ | 1,295.00 |
| State excise tax on unleaded | $ | 2,000.00 |
| Cost of E85 before fuel tax credit | $ | 16,795.00 |
| Cost/gallon of E85 before credit | $ | 1.67 |
| Fuel tax credit | $ | (3,960.00) |
| **Net cost of E85** | **$** | **12,835.00** |
| Cost/gallon of E85 after credit | $ | 1.28 |

### BASE CASE COST OF UNLEADED GASOLINE

Net price from Distributor/Blender

| | | |
|---|---|---|
| Cost of unleaded (100% of total gallons) | $ | 10,000.00 |
| Federal excise tax on unleaded | $ | 1,840.00 |
| State excise tax on unleaded | $ | 2,000.00 |
| **Net cost of unleaded** | **$** | **13,940.00** |
| Cost/gallon of gasoline | $ | 1.39 |
| **Savings per gallon of E85 over unleaded** | **$** | **0.11** |

### Fuel Tax Credit (FORM 6478)

| | | |
|---|---|---|
| **# Gallons of ethanol used** | | **8,500** |
| **Credit % per gallon** | **$** | **0.53** |
| | | **4,505.00** |
| **Less reduction of credit due to reduced excise tax** | | |
| **# of gallons** | | **10,000** |
| **reduction of excise tax %** | | **0.0545** |
| | **$** | **(545.00)** |
| **Net fuel tax credit** | **$** | **3,960.00** |

Notes to explanation:

* Federal Excise taxes are paid at fuel terminal. Tax is added to supplier's invoice at the time fuel is loaded to the distributor. Gasoline federal excise tax = $0.184/gallon, E85 = $0.1295/gallon. Forms that apply: IRS Forms 8849 and 6478. Publications that apply: IRS 378 and 510.
* Form 8849 is the federal excise tax refund form. This form is used to claim a refund for the lower federal excise tax on E85 in situations where the higher excise tax has been paid. This form is filed separately from a company's income tax return.
* Form 6478 to claim the fuel tax credit is filed with the quarterly income tax return.
* Retailers that install (at their own expense) alternative fuel refueling property may be eligible for additional federal income tax deductions. (Clean Fuel Refueling Property) IRS Publication 535, Chapter 15. This provision of the tax code allows for accelerated depreciation of certain clean fuel vehicle refueling property. The deduction is limited to $100,000 cumulatively per location. Recapture rules apply should the property cease to qualify as a clean fuel vehicle refueling site. (E85 is classified by the IRS as a Clean Fuel.)

The use of federal income tax credits become complicated by the unique characteristics of each individual, company, or corporation seeking to utilize these incentives. For example, in order to take advantage of a federal income tax credit, the organization seeking to use the credit must have a federal income tax liability. Many corporations are assessed tax rates pursuant to the federal Alternative Minimum Tax. Companies being taxed pursuant to AMT relates would have difficulty in taking advantage of the tax incentives described above. Additionally, there is a maximum tax credit that any single company may take in any one tax year.

The NEVC strongly encourages each company to consult tax advisers.

## *Fuel Flex Vehicles/Alternative Fuel Vehicles*

Vehicles that run on E85 are considered Fuel Flex Vehicles (FFV) or Alternative Fuel Vehicles (AFV). These vehicles allow a driver to use any combination of gasoline or ethanol, from 100% unleaded gasoline to 85% ethanol. FFV or AFV contain a fuel sensor or Powertrain Control Module that that detects the alcohol content of the fuel after it has been dispensed into the vehicle. This amount will mix with fuel that is currently in the tank. This sensor automatically makes the adjustments the vehicle needs to operate on either gasoline or E85. Other special parts include the fuel delivery system, fuel tank, fuel lines, fuel injectors, computer system, anti-siphon device and dashboard gauges. .

Although there are many modifications for FFV/AFV compared to a non-E85 vehicle, auto manufactures generally sell FFV/AFV at comparable prices. Many government incentives including grants are available.

There are approximately 4.5 million E85 compatible vehicles on the American roads today, with 120 new models scheduled for release in 2006. Manufactures of FFV/AFV are required to warranty the exhaust emissions from these vehicles for 10 years or 100,000 miles. There are currently 750,000 flexible fuel vehicles on the market this year.

There are currently no conversion or aftermarket products that have been certified by the Environmental Protection Agency (EPA) as meeting the standards to maintain clean exhaust emissions. The differences in engine sizes, fuel injector's, air-fuel ratio, PCM calibrations, OBD, material composition of fuel lines, fuel pumps, fuel tanks, and other parts contribute to making a E85 conversion kit very difficult.

## *E Diesel*

E diesel is a blend of standard No. 2 diesel fuel containing up to 15% ethanol and a proprietary additive to maintain blend stability. This fuel has the potential to reduce certain components of exhaust emissions compared to regular No. 2 diesel. Currently **E diesel fuels are considered experimental**. More controlled testing is necessary to expand the durability, materials compatibility, emissions, and fuel economy for the diverse range of engines and duty cycles. Recently an E diesel Consortium has been formed to address the emerging technical, regulatory, and developmental issues associated with E diesel.

E diesel lowers the pour point of the fuel. No. 2 diesel will gel with lower temperatures, with a lower pour point E diesel reduces the need to blend No. 1 diesel/kerosene into winter blends. **It is not known if E diesel can be used widely in a diesel fleet with various vehicles with a diverse fuel system**. Each engine family, application and duty cycle will prove a variety of fuel economy test results. Tests on some equipment have shown fuel economy losses of less than 1% while others have been as high as 8% to 11% at the 15% ethanol concentration level.

## *Biodiesel/B100*

Biodiesel/B100 is a fuel for diesel engines produced from renewable fats and oils such as soybean oil. Biodiesel contains no petroleum, but it can be blended with petroleum diesel to create a biodiesel blend. This fuel is made from separating glycerin from fat or vegetable oil. This process leaves behind two products, biodiesel and glycerin. Glycerin is a valuable byproduct used in soaps and other products. According to the Department of Energy/United States Department of Agriculture lifecycle analysis shows for every unit of fossil energy it takes to make biodiesel, 3.2 units of energy are gained. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. B2 (2% biodiesel, 98% petroleum diesel), B5 (5% biodiesel, 95% petroleum diesel), B20 (20% biodiesel, 80% petroleum diesel) are common mixtures that are splashed blended to create the desired combination.

Biodiesel/B100's positive characteristics as an alternative fuel include the following:

- Renewable resource
- Lower emissions
  - Reduction of unburned hydrocarbons/nitrogen oxides (ozone or smog forming originators) by 50%
  - Reduction of carbon dioxide by 78%
  - Reduction of carbon monoxide by 48%
  - Reduction of particulate matter which is linked to asthma and other diseases by 47%
  - Reduction of polycyclic aromatic hydrocarbons (PAH) and nitrated PAH compounds (cancer causing compounds)
- Biodegradable
- Non-toxic
- Free of sulfur or aromatic compounds
- Burns cleaner than petroleum diesel fuel
- Creates greater lubricity
- Higher oxygen content
- Protects engines
- Longer life expectancies for engines
- Similar fuel consumption, horse power, torque, and haulage rates
- First and only alternative fuel to complete testing requirements of the Clean Air Act
- Only alternative diesel fuel approved as an Energy Policy Act compliant mechanism

Ford Motor Company has the following concerns with a biodiesel concentration greater than 5%:

1. Requires special care at low temperatures to avoid excessive rise in viscosity and loss of fluidity.
2. Storage is a problem due to higher than normal risk of microbial contamination due to water absorption as well as a higher rate of oxidation stability which creates insoluble gums and sediment deposits.
3. Being hygroscopic, the fuel tends to have increased water content, which increases the risk of corrosion.
4. Biodiesel tends to cause higher engine deposit formations.

5. The methyl esters in biodiesel fuel may attack the seals and composite materials used in vehicle fuel systems.
6. It may attack certain metals such as zinc, copper based alloys, cast iron, tin, lead, cobalt, and manganese.
7. It is an effective solvent, and can act as a paint stripper, while it will tend to loosen deposits in the bottom of fuel tanks of vehicles previously ran on mineral diesel.

Biodiesel/B100's negative characteristics as an alternative fuel include the following:

- The softening and degrading of certain types of elastomers and natural rubbers
- Negative impact in fuel systems components, primarily fuel hoses and fuel pump seals
- Releases deposits built up from tank walls and pipes from previous diesel fuel usage
- Require more frequent fuel filter replacement when first converting
- Dissolves certain types of paints

**According to International engines, B100 is generally not recommended for use in engines.**

In the US, the industry that defines the consensus on diesel fuels is the American Society for Testing and Materials (ASTM) and D02. D02 is comprised of fuel producers, engine equipment manufacturers, and third party interests.

## *B2/B5*

B2 is a splash blend of 2% biodiesel and 98% petroleum diesel. B5 is a splash blend of 5% biodiesel and 95% petroleum diesel. The properties of B2 and B5 are blends that are within diesel specification limits and **meet the ASTM D6751 Standards and are EPA registered**.

In 2001, 100 of the United States largest fleets used a splash blend of biodiesel. These fleets include the United State Postal Service, United States Department of Agriculture, Army and Air force.

B2 and B5's positive characteristics as an alternative fuel include the following:

- Safe to use in any compression-ignition engines
- Will not void engine warranties
- Longer engine life
- Increase of up to 11% in fuel economy
- Quieter engine
- A 1% blend can provide up to 65% increase in lubricity
- **Ratios up to B5 can be used with an existing fleet with no modifications to vehicles, facilities, and engine procedures**
- Contains many elements of B100

Ford Motor Company states that the World-Wide Fuel Charter, (a compilation of fuel quality requirements endorsed by the Alliance of Automobile Manufacturers, the European Automobile Manufacturers Association (ACEA), the Engine Manufacturers Association, the Japanese Automobile Manufacturers Association and a number of other automobile manufacturer trade associations around the world) **does not endorse fuels that contain more than 5% biodiesel**. Higher blends of 5% are not within ASTM D975 diesel specifications.

B2 and B5's negative characteristic as an alternative fuel include the following:

- Increases the cost of diesel by two to three cents

### *B20*

B20 is a splash blend of 20% biodiesel and 80% petroleum diesel.

B20's positive characteristics as an alternative fuel include the following:

- Generally used in unmodified diesel engines
  - OEM and engine guarantees **should be reviewed** to assure that it does not violate manufactures warranties
- Typically used in commercial fleets that are subject to environmental concerns in the urban environment
- Similar fuel consumption, horsepower, torque, and haulage rates as conventional diesel fuel

## ***Examples***

### Nebraska State Government

Governor Dave Heineman announced on May 20, 2005 an executive order directing all state agencies that use fleet vehicles to require state employees to use E85 ethanol and biodiesel fuel whenever available within a reasonable distance, while operating the state's flexible-fuel or diesel-powered vehicles.

The Governor stated that alternative fuels benefit our cities, our environment, as well as reducing our dependence on foreign oil.

The state currently requires fleet vehicles to use E10 unleaded. This was mandated in 1980.

### University of Nebraska-Lincoln

On June 30, 2005 the University of Nebraska-Lincoln announced that 870 cars, trucks, buses, vans, tractors and utility vehicles of their fleet will run on biodiesel and ethanol blended gasoline produced primarily from Nebraska crops. Diesel vehicles such as buses, tractors, some pickups and other vehicles will operate with B2 and vans, pickups, and sedans will use E10 unleaded ethanol blend, as well as 26 FFV that will use E85.

### *Minnesota*

In September of 2004, Minnesota Governor Tim Pawlenty signed an executive order requiring state agencies to reduce gasoline use in on-road vehicles 25% by 2010 and 50% by 2015 and to reduce petroleum-based diesel fuel use 10% by 2010 and 25% by 2015. At least 75% of most new on-road vehicles must be powered by biodiesel (blends of 20% or greater), ethanol (blends of 70% or greater), or hydrogen. Minnesota's Department of Administration currently has 1,130

FFVs in the fleet. The implementation of this order should result in a 25-fold increase in the state's E85 use to 1.7 million gallons per year. Current uses are approximately 68,000 gallons of E85 annually.

Minnesota's Department of Natural Resources has a fleet of 1,500 to 1,700 vehicles of which 10% are FFVs. Their policy is to buy 100% FFVs when they're available for passenger vehicles and whenever there isn't enough charge for light trucks.

## *City of Grand Island*

The City of Grand Island's municipal fleet consists of many on-road and off-road vehicles. Currently the Fleet Services fuels and services nine of the thirteen city departments. Three 10,000 gallon tanks located at the Fleet Services facility fuel 249 vehicles of the city's fleet, of which 159 vehicles function on gas and 90 vehicles operate on diesel. The three tanks contain regular unleaded, Supra/E10 (10% ethanol 90% unleaded), and a 2% Biodiesel. In the 2005 FY Fleet Services purchased the following amounts of fuels.

| Totals | | Amount | Perc | Price |
|---|---|---|---|---|
| Unlead | | 23,001 | 22% | $38,434 |
| Ethanol | | 83,101 | 78% | $149,876 |
| Diesel | | 59,503 | 100% | $109,320 |

Fleet Services collects data electronically from every vehicle that fuels at the municipal facility. This data has been imputed into many reports to explain the use of fuel within our fleet. In the 2005 FY Fleet Services purchased more E10 than unleaded at a rate of 78% to 22% respectfully. The trends of this ratio have been recorded over the past three years. According to the 2005 purchase report, E10 was purchased at $1.717 per gallon on an average and regular unleaded was purchased at an average of $1.714 per gallon with a difference of $.003 per gallon.

Within the city's fleet eight vehicles are made pre-1986, six of these vehicles use E10. Of these vehicles 817.62 gallons of unleaded and 442.56 gallons of E10 are used. Many vehicles fuel up with a different mixture of fuel every other fill. The miscellaneous Parks Department accounts currently use 2,581.16 gallons of unleaded and 188 gallons of E10 of which the majority is used for small engines.

In June of 2005 Fleet Services replaced regular petroleum diesel with a 2% diesel blend and will continue the use of the biodiesel splash mix until a winter blend is needed. The replacement of biodiesel cost the city 1¢ more per gallon compared to regular petroleum diesel. The cost of biodiesel with an increased price of 1¢ per gallon for one year using the FY 2005 gallons used amounts would be $595.03 more than the purchase of regular diesel a year. Routine maintenance including the replacement of fuel filters has created no problems in any vehicles thus far. This fuel can be used in all diesel engines of the city's fleet.

The Public Works Department's Waste Water Treatment Plant and Solid Waste have separate fuel tanks on site for greater efficiency. Together these divisions use 56,849 gallons of on-road diesel and 36,725 gallons of off-road diesel as well as 725 gallons of ethanol. According to Bud

Buettner, Assistant Public Works Director these divisions are scheduled to use biodiesel in all of their diesel equipment in the spring of 2006.

The City of Grand Island consumes a total of 83,826 gallons of ethanol, 23,001 gallons of regular unleaded, 21,000 gallons of biodiesel, and 132,077 gallons of On-Road/Off-Road diesel.

In the 2006 FY the City of Grand Island municipality will purchase 16 gas engine vehicles and three diesel engine vehicles. Between the FY 2006 and FY 2009 various departments are scheduled to purchase 62 regular gas engine vehicles and 19 diesel engine vehicles. The majority of these vehicles will replace older vehicles or fill a needed vehicle position. The police department will purchase six vehicles a year to keep up with the demand of the police department.

The following Resolution was adopted March 8, 1993. According to the resolution gasohol should be the preferred fuel for use in City-owned motor vehicles.

RESOLUTION 93-020

WHEREAS, city vehicles use approximately 106,000 gallons of fuel annually; and

WHEREAS, the use of gasohol provides a significant reduction of harmful exhaust emissions from motor vehicles; and

WHEREAS, the environmental benefits of gasohol use currently outweigh the increased cost over regular unleaded fuel;

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA, that gasohol shall be the preferred fuel for use in the City-owned motor vehicles equipped to use unleaded fuels.

• • •

Adopted by the City Council of the City of Grand Island, Nebraska, March 8, 1993.

APPROVED
as to form
March 3, 1993
Legal Department

Cindy K. Cartwright, City Clerk

Currently 15 of the 159 vehicles that fuel at the Fleet Services facility do not consume E10, or 11% of the fleet does not use E10. However, not all of the 89% of E10 users use E10 100% of the time. In fact, 22,183.38 gallons of unleaded fuel used by 128 post 1986 vehicles have the capability of using E10.

## ***Recommendation for the City of Grand Island fleet***

The City of Grand Island Administration recommends the following criteria for the municipal fleet.

***Recommendation 1***

Mandate all post-1986 vehicles within the municipal owned fleet burn ***only E10.***

The City of Grand Island utilized 83,826 gallons of E10 and 23,001 gallons of regular unleaded in the 2004-05 FY. A mandate of all municipally owned vehicles to ***only use E10 when applicable***, would result in the following:

- Fleet Services would not have enough demand to keep unleaded on hand. A reserve of unleaded fuel only consumed by the Parks Department's small engine fleet and two pre-1986 vehicles would cause the fuel to go bad over a period of time.
- The two 10,000 gallon tanks of fuel will be converted as E10 tanks.
- A smaller separate tank could be purchased for unleaded engines. This would only be required if the Parks Department small engine fleet is exempt from the E10 mandate.
    - Parks Maintenance small engine fleet utilizes 2,500 gallons of unleaded fuel per year. The purchase of a 500 gallon fuel tank and pump could be obtained and installed for $9,000.
- Unleaded engines would have to purchase fuel from non-municipal filling stations if a tank is not purchased. Federal and State tax credit on fuel could be lost. Last year small engines and pre-1986 vehicles used 2,810 gallons of fuel. Taxes lost on these dollars would be $2,285.

A conversion of 25% regular unleaded fuel to E10 would cost an additional $264.73 according to the 2004-05 purchasing data. The price difference is calculated at the same purchasing times of ethanol and unleaded.

The conversion of 23,001 gallons of unleaded fuel per year to E10 will also cost the City $600.00 more in fuel economy. However more dollars will be created locally by using a domestic, renewable product. Ethanol products burn cleaner, enhance engine performance, prevent engine deposits, and reduce emissions.

***Recommendation 2***

Require departments to purchase Fuel Flex Vehicles/Alternative Fuel Vehicles when available from state bid. FFV/AFV must meet the requirements of the application set forth by the department. When the municipal fleet has obtained a fleet of 25% FFV/AFV the expectation of purchasing/converting an E85 tank and pump should be examined for Fleet Services.

FFV/AFV have the ability to burn regular unleaded and ethanol mixtures of E10 to E85. The State increases the number of these special vehicles each year at little or no additional cost. This years state bid will include many sedans currently used by our municipality and half ton pickups. There are many incentives that will pay for a portion of FFV/AFV fleets and programs for municipalities.

***Recommendation 3***

Mandate that all summer blends of on/off Road diesel fuel contain a biodiesel splash blend of 4% but not greater than 5%.

In the spring of 2006 the entire municipal fleet will be using a splash blend of 2% biodiesel. A recommended increase of a 4% (not to exceed 5%) blend of biodiesel would increase lubricity, efficiency, engine life, and environmental gains.

## ***References***


1. American Petroleum Institute, "Monthly Petroleum Facts at a Glance", *Industry Statistics*, September 14, 2005, http://api-ec.api.org/industry/index.cfm?objected.com

2. American Petroleum Institute, "What a barrel of crude oil makes", *About Oils and Natural Gases Frequently Asked Questions*, 2002, http://api-ec.api.org/about/index.cfm?objectid.com

3. American Coalition for Ethanol, "Fuel Economy Study", *Comparing Performance and Cost of Various Ethanol Blends and Standard Unleaded Gasoline, August 24*, 2005, http://www.ethanol.org/documents/ACEFuelEconomyStudy.pdf

4. Cummins, "What is Cummins' position on the use of Biodiesel fuel in Cummins engines?" , February 2, 2005, http://www.cummins.com

5. E 10, "E-10 Unleaded", http://www.e10unleaded.com

6. Ford, "Biodiesel technology" *Ford Motor Company Position*, February 2, 2005, https://www.fleet.ford.com/showroom/environmental_vehicles/BiodieselTechnology.asp

7. John Deere, "Biodiesel Fuel in John Deere Tractors" *Biodiesel Fuel in John Deere Tractors: John Deere*, February 25, 2005, http://www.deere.com/en_US/ag/servicesupport/tips/tractors/9000/Biodiesel_in_John_Deere_Tractors.html

8. International, "Biodiesel Fuels", *Technical Service Information*, TSI-05-12-21, May 2005

9. National Biodiesel Board, "The Official Site of Biodiesel fuel", 1998 – 2005, http://www.biodiesel.org/

10. National Ethanol Vehicle Coalition, "Frequently Asked Questions" E85, http://e85fuel.com/index.php

11. Nebraska Ethanol Board, "Ethanol Facts" Ethanol, *E diesel, E85, E10, &FFV*, 2005, http://www.ne-ethanol.org

12. Nebraska Petroleum Marketers & Convenience Store Association, "E85 Frequently Asked Questions" National Ethanol Vehicle Coalition, April 25, 2005, http://www.npcainc.com/npcanews_nonmember-detail.asp?newsID=150

13. Nebraska Rural Initiative News, Ianr News, "Alternative Fuels are the Right Thing to Do'", June 30, 2005, http://ruralinitiative.nebraska.edu/news/946

14. United States Environmental Protection Agency (EPA), "The Air Pollution Control Program" *Fleet Buyer Guide Financial Incentives*, www.epa.gov

15. United States Department of Energy, "Handbook for Handling, Storing, and Dispensing E85", *Office of Energy Efficiency and Renewable Energy*, April 2002, http://www.e85fuel.com/pdf/ethanol_guidebook.pdf

16. United States Department of Energy, "Fleet Information and Regulations", *Success Story, Minnesota*, February 2005, http://www.eere.energy.gov/vehiclesandfuels/epact.com

# *Fuel Purchases for the Municipal Garage*

## Fiscal Year 04 - 05

| Date | 9/29/04 | 11/2/04 | 12/6/04 | 1/4/05 | 2/3/05 | 3/1/05 | 4/1/05 | 5/3/05 | 6/2/05 | 6/30/05 | 7/28/05 | 8/31/05 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Notes | | | | | | | | | | | | | |
| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | |
| Unlead | | $1.903 | $1.705 | $1.650 | $1.892 | $1.936 | $2.156 | $1.980 | $1.991 | $2.123 | $2.145 | $2.761 | |
| Amount | 4701 | | 5200 | | | 4700 | | 3000 | 3000 | 2400 | | | |
| Per Gal. | $1.636 | | $1.410 | | | $1.679 | | $1.800 | $1.831 | $1.928 | | | $1.714 |
| Total $ | $ 7,691 | | $ 7,332 | | | $ 7,891 | | $ 5,400 | $ 5,493 | $ 4,627 | | | |
| Ethanol | | $1.903 | $1.705 | $1.650 | $1.892 | $1.936 | $2.156 | $1.980 | $1.991 | $2.123 | $2.145 | $2.761 | |
| Amount | 7600 | 7099 | 7500 | 6400 | 6900 | 5900 | 7000 | 6998 | 7002 | 7102 | 7100 | 6500 | |
| Per Gal. | $1.667 | $1.665 | $1.483 | $1.434 | $1.650 | $1.675 | $1.925 | $1.757 | $1.803 | $1.916 | $1.927 | $2.790 | $1.717 |
| Total $ | $12,669 | $11,820 | $11,123 | $ 9,178 | $11,385 | $ 9,882 | $ 13,475 | $ 12,295 | $ 12,625 | $ 13,607 | $ 13,682 | $ 18,135 | |
| Diesel | | $1.980 | $1.727 | $1.727 | $1.903 | $2.046 | $2.288 | $2.035 | $2.112 | $2.244 | $2.255 | $2.662 | |
| Amount | 5100 | 5501 | 4901 | 3200 | 6800 | 3200 | 4000 | 5000 | 6000 | 5201 | 7600 | 3000 | |
| Per Gal. | $1.720 | $1.745 | $1.482 | $1.499 | $1.660 | $1.843 | $1.997 | $1.855 | $1.918 | $2.037 | $1.962 | $2.476 | |
| Total $ | $ 8,772 | $ 9,599 | $ 7,263 | $ 4,797 | $11,288 | $ 5,897 | $ 7,988 | $ 9,275 | $ 11,508 | $ 10,594 | $ 14,911 | $ 7,428 | |
| Month Total | $29,132 | $21,419 | $25,718 | $13,975 | $22,673 | $23,670 | $21,463 | $26,970 | $29,626 | $28,829 | $28,593 | $25,563 | |
| | | | | | | | | | | | Fiscal Year Total | | $297,630 |

| **Totals** | | **Amount** | **Perc** | **Price** |
|---|---|---|---|---|
| Unlead | | 23,001 | 22% | $38,434 |
| Ethanol | | 83,101 | 78% | $149,876 |
| Diesel | | 59,503 | 100% | $109,320 |

## Diesel Vehicles Fueled at the City Shop

| Department | Year | Make | Diesel | Cost |
|---|---|---|---|---|
| 208 | 2001 | Ford F-350 | 349.48 | $ 683.57 |
| 211 | 1996 | IH 4700 | 180.30 | $ 329.04 |
| 212 | 1999 | GMC C3500 | 500.44 | $ 1,003.75 |
| 213 | 1995 | IH 4700 | 91.87 | $ 186.65 |
| 217 | 2001 | IH 4700 | 390.49 | $ 760.90 |
| 218 | 2002 | IH 4700 | 388.93 | $ 765.80 |
| 219 | 2002 | IH 4700 | 355.75 | $ 659.87 |
| 220 | 1995 | IH 4700 | 594.98 | $ 1,185.44 |
| 221 | 2001 | Sterling LT 7500 | 1,572.37 | $ 3,097.00 |
| 222 | 1995 | IH 4900 | 674.70 | $ 1,309.09 |
| 223 | 1996 | GMC TOPKICK7000 | 1,138.34 | $ 2,244.66 |
| 224 | 1996 | GMC TOPKICK7000 | 856.50 | $ 1,727.30 |
| 225 | 1996 | IH 4700 | 165.61 | $ 298.50 |
| 226 | 2003 | GMC C7500 | 144.59 | $ 261.44 |
| 227 | 1995 | IH 4700 | 146.01 | $ 263.87 |
| 228 | 2001 | Sterling LT 7500 | 1,638.23 | $ 3,324.74 |
| 229 | 2003 | GMC C8500 | 1,356.89 | $ 2,702.91 |
| 230 | 1975 | CAT 120G | 491.52 | $ 862.05 |
| 231 | 2002 | Volvo G736VHP | 2,021.92 | $ 3,915.77 |
| 232 | 1980 | CAT 120G | 1,404.35 | $ 2,679.60 |
| 233 | 2005 | Bobcat S150 | 161.71 | $ 348.33 |
| 234 | 1975 | Cat 120G | 153.55 | $ 272.66 |
| 235 | 2000 | NW Holland LW170 | 793.29 | $ 1,561.30 |
| 236 | 1995 | Case 621-b | 646.25 | $ 1,285.64 |
| 237 | 1998 | Bobcat 753 | 215.47 | $ 427.42 |
| 238 | 1998 | Case 721b | 856.55 | $ 1,654.13 |
| 239 | 1991 | Grade All G660e | 90.87 | $ 186.92 |
| 241 | 2004 | GMC T7500 | 506.50 | $ 1,086.85 |
| 242 | 1997 | Elgin Pelican | 518.21 | $ 1,016.23 |
| 243 | 2000 | Elgin Pelican | 1,317.57 | $ 2,654.24 |
| 244 | 1993 | Elgin Pelican | 1,086.66 | $ 2,206.95 |
| 245 | 2000 | Case CX90 | 771.08 | $ 1,588.03 |
| 246 | 2003 | Elgin Pelican | 1,312.97 | $ 2,652.06 |
| 247 | 2004 | NW Holland TS100a | 849.58 | $ 1,759.77 |
| 248 | 2005 | TEREX TX760B | 226.77 | $ 483.26 |
| 249 | 1999 | John Deer 5210 | 477.68 | $ 994.92 |
| 251 | 2003 | NW Holland Ts110 | 1,340.58 | $ 2,720.02 |
| 259 | 1997 | Bartco BM90 | 253.66 | $ 501.63 |
| 260 | 2004 | Ingersoll P185WJD | 129.96 | $ 275.62 |
| 262 | 2000 | Leroi !186DJE | 6.82 | $ 11.85 |
| 263 | 2003 | Ingersoll P185WJD | 191.92 | $ 382.26 |
| 275 | 2004 | Hatz 1db1z | 57.81 | $ 126.82 |
| 290 | 1980 | Root 936 | 130.39 | $ 225.18 |
| 337 | 1995 | Chevrolet C3500 | 119.63 | $ 236.95 |
| 398 | 1991 | GMC Top Kick | 60.85 | $ 121.65 |
| 521 | 2003 | Ford E450 Ambulance | 1,919.19 | $ 3,805.08 |
| 522 | 2001 | Ford E450 Ambulance | 1,856.88 | $ 3,700.66 |
| 523 | 2000 | Ford E450 Ambulance | 671.52 | $ 1,363.17 |
| 524 | 2000 | Ford E450 Ambulance | 685.63 | $ 1,343.36 |
| 526 | 1992 | Ford E350 Ambulance | 22.68 | $ 43.78 |
| 527 | 1993 | Ford E-350 Ambulance | 128.34 | $ 262.64 |

| | | | | | |
|---|---|---|---|---|---|
| 528 | 1995 | Ford E350 Ambulance | 60.24 | $ | 120.31 |
| 541 | 1990 | Ford C800 | 166.55 | $ | 328.96 |
| 544 | 2000 | Freightlner Fl80 | 1,191.75 | $ | 2,382.51 |
| 545 | 1987 | Ford F800 | 70.82 | $ | 141.02 |
| 547 | 1999 | Freightlner Fl70 | 855.27 | $ | 1,711.10 |
| 548 | 1995 | Freightlner Unknown | 1,029.99 | $ | 2,059.51 |
| 551 | 2003 | Ford F350 | 122.05 | $ | 242.54 |
| 572 | 2000 | E-One Ladder | 967.89 | $ | 1,954.40 |
| 581 | 1997 | Freightlner Fl70 | 1,091.64 | $ | 2,164.80 |
| 582 | 2002 | Ford F550 | 90.58 | $ | 180.76 |
| 640 | 1996 | IH 4700 | 1,108.83 | $ | 2,194.03 |
| 789 | 1975 | John Deer 500C | 127.02 | $ | 237.50 |
| 904 | 2004 | Ford F250 | 1,108.68 | $ | 2,195.98 |
| 907 | 1997 | Ford F800 | 215.57 | $ | 425.54 |
| 920 | 1999 | John Deere 410E | 443.62 | $ | 864.03 |
| 921 | 2004 | Ford F250 | 522.75 | $ | 1,043.19 |
| 1206 | 1995 | IH 4700 | 721.36 | $ | 1,432.76 |
| 1503 | 2000 | Vermeer 1230 | 572.59 | $ | 1,150.03 |
| 1541 | 2005 | Freightlnr M2106 | 739.67 | $ | 1,526.26 |
| 1545 | 1999 | CP Unkown | 739.67 | $ | 1,526.26 |
| 1551 | 2001 | IH 4900 | 2,076.58 | $ | 4,130.97 |
| 1554 | 2000 | IH 4900 | 896.36 | $ | 1,797.87 |
| 1555 | 2004 | Freightlnr Fl80 | 1,195.11 | $ | 2,393.15 |
| 1556 | 1996 | Ford F800 | 98.55 | $ | 197.32 |
| 1559 | 1999 | IH 4900 | 869.87 | $ | 1,747.67 |
| 1561 | 1996 | Ford F800 | 781.03 | $ | 1,569.77 |
| 1562 | 2002 | Ford F550 | 1,135.56 | $ | 2,276.40 |
| 1563 | 2002 | Freightlnr Fl70 | 565.30 | $ | 1,122.00 |
| 1569 | 1993 | IH 4900 | 451.51 | $ | 895.46 |
| 1573 | 1998 | IH 4900 | 970.28 | $ | 1,945.11 |
| 1574 | 2003 | SDP 2500 | 4.85 | $ | 9.30 |
| 1577 | 2002 | Freightlnr FL80 | 817.60 | $ | 1,662.96 |
| 1600 | 1996 | Ford 675D Turbo | 252.82 | $ | 488.39 |
| 1602 | 1991 | CP 185 | 54.14 | $ | 106.63 |
| 1605 | 1994 | Ditch Witc 5110 | 82.26 | $ | 163.92 |
| 1609 | 2002 | Ditch Witc FX30 | 26.65 | $ | 52.73 |
| 1615 | 2002 | Bobcat S185 Turbo | 228.78 | $ | 445.14 |
| 1649 | 2004 | Sterling LT 7500 | 328.89 | $ | 678.95 |
| 1678 | 2003 | IH 7600 | 741.98 | $ | 1,436.29 |
| 1679 | 2004 | Ford F250 | 596.45 | $ | 1,186.78 |
| Old 241 04 | 1992 | Ford Vac All | 155.02 | $ | 269.42 |
| | | | 56,299.97 | $ | 112,019.05 |

| Department | Year | Make | Diesel | | Cost |
|---|---|---|---|---|---|
| 199 Utilities | 2001 | De0partment Mis | 330.16 | $ | 661.38 |
| 4 City Main | 2000 | Department, Misc | 8.13 | $ | 14.45 |
| 299 Street | 2001 | Department, Misc | 1,422.39 | $ | 2,926.33 |
| 399 Parks | 2000 | Department, Misc | 4,166.26 | $ | 8,635.83 |
| 599 Fire | 2000 | Department, Misc | 26.85 | $ | 56.46 |
| | | | 5,953.79 | $ | 12,294.45 |

| | | | |
|---|---|---|---|
| **Total** | **62,253.76** | **$** | **124,313.50** |

| | | | Unleaded Year | | | | | |
|---|---|---|---|---|---|---|---|---|
| Department | Year | Make | Unleaded | | Cost | Ethanol | | Cost |
| 240 | 1970 | IH Unkown | 59.74 | $ | 112.13 | 0.00 | $ | - |
| 1674 | 1970 | Ford F750 | 99.65 | $ | 182.84 | 27.89 | $ | 50.89 |
| 203 | 1977 | Ford F-600 | 101.61 | $ | 199.94 | 0.00 | $ | - |
| 1565 | 1979 | Ford F700 | 162.18 | $ | 307.40 | 80.20 | $ | 153.90 |
| 860 | 1981 | Chevrolet G30 | 0.00 | $ | - | 62.63 | $ | 118.21 |
| 1666 | 1981 | Ford F606 | 205.43 | $ | 379.17 | 182.92 | $ | 356.24 |
| Old 082 05 | 1984 | F250 | 124.13 | $ | 227.62 | 7.04 | $ | 12.24 |
| 606 | 1985 | Dodge Ram 1500 | 16.54 | $ | 32.77 | 13.73 | $ | 29.45 |
| 641 | 1986 | GMC S10 | 48.34 | $ | 92.87 | 68.15 | $ | 131.83 |
| 391 | 1987 | Ford Bronco | 0.00 | $ | - | 116.05 | $ | 226.61 |
| 908 | 1987 | Ford F350 | 319.74 | $ | 637.10 | 130.33 | $ | 256.18 |
| 339 | 1988 | Toyota ½T Pickup | 147.27 | $ | 288.23 | 101.85 | $ | 199.09 |
| 336 | 1990 | Toyota Unknown | 229.60 | $ | 453.09 | 0.00 | $ | - |
| 205 | 1991 | Ford F150 | 57.67 | $ | 117.00 | 356.32 | $ | 668.97 |
| 5 | 1992 | Ford F-150 | 45.96 | $ | 92.91 | 11.14 | $ | 24.02 |
| 310 | 1992 | Chevrolet S-10 | 0.00 | $ | - | 85.12 | $ | 157.10 |
| 332 | 1992 | Chevrolet 3500 | 108.97 | $ | 212.09 | 256.84 | $ | 493.03 |
| 1870 | 1992 | Chevrolet S10 | 89.96 | $ | 177.68 | 260.76 | $ | 496.42 |
| Old 857 05 | 1992 | Chevrolet Cavalier | 73.92 | $ | 128.85 | 14.71 | $ | 27.99 |
| 389 | 1993 | GMC ½T Pickup | 89.14 | $ | 177.98 | 197.00 | $ | 383.58 |
| 390 | 1993 | GMC ½T Pickup | 123.96 | $ | 231.42 | 298.50 | $ | 584.30 |
| 566 | 1993 | Ford Bronco | 56.71 | $ | 97.96 | 80.02 | $ | 150.70 |
| 825 | 1993 | Dodge Caravan | 26.35 | $ | 52.99 | 188.14 | $ | 367.03 |
| 1667 | 1993 | Ford F250 | 49.40 | $ | 99.07 | 428.64 | $ | 813.35 |
| 304 | 1994 | Ford F-150 | 462.82 | $ | 901.93 | 0.00 | $ | - |
| 1053 | 1994 | Chevrolet 1500 | 52.35 | $ | 108.34 | 754.83 | $ | 1,463.37 |
| 1672 | 1994 | Ford F250 | 539.51 | $ | 1,032.53 | 36.53 | $ | 69.20 |
| 1875 | 1994 | Plymouth Acclaim | 45.96 | $ | 90.62 | 46.59 | $ | 88.94 |
| 330 | 1995 | GMC 1500 | 28.02 | $ | 60.41 | 370.34 | $ | 705.43 |
| 837 | 1995 | Toyota Corolla | 0.00 | $ | - | 10.07 | $ | 21.60 |
| Old 308 05 | 1995 | Chevrolet Caprice | 30.18 | $ | 54.85 | 38.18 | $ | 69.19 |
| 257 | 1996 | CrAFCO 200 | 42.12 | $ | 83.63 | 0.00 | $ | - |
| 301 | 1996 | GMC Sonoma | 13.54 | $ | 29.04 | 638.00 | $ | 1,235.49 |
| 506 | 1996 | Chevrolet Corsica | 25.33 | $ | 42.48 | 230.03 | $ | 445.47 |
| 509 | 1996 | Chevrolet Corsica | 221.88 | $ | 405.28 | 126.41 | $ | 249.14 |
| 833 | 1996 | Dodge Dakota | 0.00 | $ | - | 7.82 | $ | 15.14 |
| 1207 | 1996 | Ford F700 | 31.19 | $ | 51.46 | 0.00 | $ | - |
| 1301 | 1996 | GMC 1500 | 714.30 | $ | 1,366.14 | 88.07 | $ | 171.55 |
| 1876 | 1996 | Chevrolet Suburban | 515.77 | $ | 990.70 | 0.00 | $ | - |
| 214 | 1997 | GMC, F9370 | 842.52 | $ | 1,601.24 | 0.00 | $ | - |
| 838 | 1997 | Ford F-250 | 491.25 | $ | 936.23 | 110.31 | $ | 209.70 |
| 853 | 1997 | Chevrolet Cavalier | 0.00 | $ | - | 130.62 | $ | 249.53 |
| 903 | 1997 | GMC C30 | 302.98 | $ | 574.09 | 73.74 | $ | 136.54 |
| 906 | 1997 | Chevrolet ¾T Pickup | 344.41 | $ | 659.99 | 503.81 | $ | 978.18 |
| 1504 | 1997 | Vermeer 630b | 64.77 | $ | 125.24 | 2.20 | $ | 4.38 |
| 10 | 1998 | Ford Crown Vic | 39.96 | $ | 79.95 | 8.33 | $ | 16.49 |
| 209 | 1998 | Chevrolet ½T Pickup | 12.52 | $ | 26.86 | 914.35 | $ | 1,746.29 |
| 392 | 1998 | Chevrolet K2500 | 26.00 | $ | 51.77 | 157.11 | $ | 307.56 |

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|---|---|---|---|---|---|---|---|---|
| 505 | 1998 | Isuzu ½T Pickup | 183.45 | $ | 354.93 | 217.60 | $ | 412.90 |
| 621 | 1998 | Dodge Ram 1500 | 129.30 | $ | 239.49 | 1,482.98 | $ | 2,830.24 |
| 905 | 1998 | Dodge Ram 2500 | 104.49 | $ | 203.59 | 1,261.48 | $ | 2,409.51 |
| 1042 | 1998 | Ford Ranger | 59.66 | $ | 114.73 | 851.37 | $ | 1,600.11 |
| 1064 | 1998 | Ford Ranger | 7.03 | $ | 12.22 | 866.75 | $ | 1,667.85 |
| 1300 | 1998 | Chevrolet K1500 | 126.74 | $ | 244.84 | 418.21 | $ | 801.74 |
| 1302 | 1998 | GMC ½T Pickup | 381.45 | $ | 736.74 | 132.52 | $ | 250.21 |
| 1660 | 1998 | Ford F15092.43 | 92.43 | $ | 162.03 | 609.82 | $ | 1,172.51 |
| 1683 | 1998 | GMC K2500 | 225.47 | $ | 416.14 | 182..20 | $ | 356.00 |
| 1899 | 1998 | Ford F150 | 147.74 | $ | 272.88 | 753.50 | $ | 1,471.12 |
| 201 | 1999 | Ford F-150 | 582.57 | $ | 1,121.41 | 16.65 | $ | 31.50 |
| 204 | 1999 | Ford F-150 | 1,061.63 | $ | 2,037.50 | 66.58 | $ | 115.90 |
| 210 | 1999 | Ford F-150 | 319.78 | $ | 625.04 | 96.80 | $ | 187.96 |
| 561 | 1999 | Ford Taurus | 193.93 | $ | 371.11 | 31.73 | $ | 60.71 |
| 602 | 1999 | Ford Taurus | 252.80 | $ | 488.76 | 32.32 | $ | 64.60 |
| Old 816 05 | 1999 | Ford Crown Vic | 53.37 | $ | 95.62 | 1,241.35 | $ | 2,238.55 |
| 258 | 2000 | CRAFCO 200 | 60.45 | $ | 119.68 | 0.00 | $ | - |
| 272 | 2000 | Northstar 2 | 1.02 | $ | 1.68 | 0.00 | $ | - |
| 393 | 2000 | Chevrolet 1500 | 104.91 | $ | 217.02 | 269.63 | $ | 497.87 |
| 394 | 2000 | Chevrolet 1500 | 0.00 | $ | - | 342.21 | $ | 647.31 |
| 500 | 2000 | Chevrolet Lumina | 5.01 | $ | 10.75 | 313.21 | $ | 600.27 |
| 507 | 2000 | Chevrolet Lumina | 210.90 | $ | 407.69 | 12.01 | $ | 23.91 |
| 564 | 2000 | Chevrolet Suburban | 488.17 | $ | 926.41 | 160.26 | $ | 321.24 |
| 607 | 2000 | Chevrolet Lumina | 224.70 | $ | 437.42 | 73.77 | $ | 145.82 |
| 832 | 2000 | Chevrolet S10 | 26.35 | $ | 52.46 | 23.53 | $ | 44.46 |
| 850 | 2000 | Chevrolet Impala | 7.04 | $ | 13.44 | 414.80 | $ | 811.01 |
| 851 | 2000 | Ford F150 | 15.97 | $ | 30.62 | 416.50 | $ | 788.39 |
| 899 | 2000 | Police Department | 27.17 | $ | 53.80 | 87.44 | $ | 170.99 |
| 902 | 2000 | dodge Ram 2500 | 215.35 | $ | 419.63 | 829.49 | $ | 1,589.43 |
| 1303 | 2000 | GMC K2500 | 520.68 | $ | 999.89 | 254.82 | $ | 494.58 |
| 1884 | 2000 | Ford Explorer | 299.16 | $ | 583.65 | 89.90 | $ | 169.40 |
| 202 | 2001 | Dodge Ram 1500 | 79.34 | $ | 166.61 | 1,004.48 | $ | 1,912.17 |
| 215 | 2001 | Dodge Ram 1500 | 46.16 | $ | 97.95 | 937.48 | $ | 1,767.52 |
| 256 | 2001 | Chevrolet S10 | 0.00 | $ | - | 513.58 | $ | 985.98 |
| 303 | 2001 | Dodge Ram 1500 | 0.00 | $ | - | 477.95 | $ | 931.56 |
| 331 | 2001 | Dodge Dakota | 0.00 | $ | - | 135.31 | $ | 270.70 |
| 333 | 2001 | Dodge Ram 1500 | 92.29 | $ | 177.13 | 287.70 | $ | 562.22 |
| 335 | 2001 | Ford F-350 | 113.85 | $ | 227.62 | 284.85 | $ | 551.30 |
| 338 | 2001 | Dodge Dakota | 24.30 | $ | 46.84 | 397.82 | $ | 769.42 |
| 361 | 2001 | Ford Aerostar | 88.66 | $ | 177.56 | 50.71 | $ | 85.64 |
| 502 | 2001 | Chevrolet Lumina | 0.00 | $ | - | 300.86 | $ | 574.28 |
| 601 | 2001 | Chevrolet Lumina | 0.00 | $ | - | 245.36 | $ | 463.51 |
| 623 | 2001 | Dodge Ram 1500 | 897.26 | $ | 1,724.34 | 402.71 | $ | 758.33 |
| 818 | 2001 | Ford Crown Vic | 51.63 | $ | 101.43 | 213.40 | $ | 414.73 |
| 831 | 2001 | Chevrolet Malibu | 45.66 | $ | 93.95 | 331.21 | $ | 601.54 |
| 834 | 2001 | GMC Van | 0.00 | $ | - | 51.76 | $ | 100.91 |
| 855 | 2001 | Chevrolet Impala | 0.00 | $ | - | 253.42 | $ | 483.72 |
| 901 | 2001 | dodge Ram 1500 | 0.00 | $ | - | 422.50 | $ | 812.01 |
| 1052 | 2001 | Chevrolet S10 | 379.95 | $ | 728.38 | 474.90 | $ | 909.20 |
| 1058 | 2001 | Chevrolet Malibu | 8.12 | $ | 15.72 | 323.76 | $ | 613.52 |

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|---|---|---|---|---|---|---|---|---|
| 1557 | 2001 | Ford F150 | 174.21 | $ | 321.14 | 674.81 | $ | 1,306.44 |
| Old 852 04 | 2001 | Chevrolet Impala | 0.00 | $ | - | 9.49 | $ | 16.49 |
| 258 | 2002 | Chevrolet Impala | 9.03 | $ | 16.99 | 469.14 | $ | 897.86 |
| 259 | 2002 | Chevrolet Impala | 0.00 | $ | - | 585.62 | $ | 1,129.32 |
| 308 | 2002 | Chevrolet Impala | 64.12 | $ | 119.21 | 242.07 | $ | 459.03 |
| 388 | 2002 | Chevrolet Impala | 70.28 | $ | 141.13 | 108.47 | $ | 208.52 |
| 395 | 2002 | Chevrolet 2500 | 50.97 | $ | 96.42 | 614.78 | $ | 1,216.04 |
| 563 | 2002 | Ford Explorer | 17.53 | $ | 33.94 | 318.14 | $ | 606.06 |
| 565 | 2002 | Ford Explorer | 256.17 | $ | 486.61 | 14.42 | $ | 28.55 |
| 608 | 2002 | Chevrolet Impala | 27.47 | $ | 50.78 | 423.54 | $ | 821.51 |
| 802 | 2002 | Ford Crown Vic | 0.00 | $ | - | 396.47 | $ | 742.92 |
| 815 | 2002 | Ford Crown Vic | 36.10 | $ | 67.45 | 1,418.57 | $ | 2,710.64 |
| 829 | 2002 | Chevrolet Camaro | 10.42 | $ | 17.77 | 636.22 | $ | 1,218.49 |
| 862 | 2002 | Chevrolet Impala | 0.00 | $ | - | 264.03 | $ | 502.20 |
| 864 | 2002 | Chevrolet S10 | 0.00 | $ | - | 516.02 | $ | 993.43 |
| 866 | 2002 | Chevrolet ½T Pickup | 0.00 | $ | - | 461.47 | $ | 886.99 |
| 900 | 2002 | Ford F150 | 610.45 | $ | 1,172.47 | 0.00 | $ | - |
| 1050 | 2002 | Chevrolet Malibu | 270.03 | $ | 515.53 | 0.00 | $ | - |
| 1208 | 2002 | Chevrolet ½T Pickup | 26.61 | $ | 52.98 | 0.00 | $ | - |
| 1686 | 2002 | Ford F250 | 86.88 | $ | 149.02 | 600.90 | $ | 1,179.48 |
| 1880 | 2002 | Chevrolet Malibu | 69.28 | $ | 130.09 | 68.45 | $ | 136.22 |
| 1881 | 2002 | Chevrolet Impala | 256.67 | $ | 501.89 | 76.18 | $ | 148.61 |
| 1885 | 2002 | Ford F250 | 446.76 | $ | 853.26 | 189.90 | $ | 365.74 |
| Old 811 05 | 2002 | Ford Crown Vic | 0.00 | $ | - | 276.59 | $ | 499.17 |
| Old 813 05 | 2002 | Ford Crown Vic | 0.00 | $ | - | 137.17 | $ | 246.30 |
| Old 814 05 | 2002 | Ford Crown Vic | 0.00 | $ | - | 229.41 | $ | 415.41 |
| Old 822 05 | 2002 | Ford Crown Vic | 0.00 | $ | - | 222.52 | $ | 404.47 |
| 396 | 2003 | Chevrolet 1500 | 25.26 | $ | 43.90 | 239.65 | $ | 495.80 |
| 562 | 2003 | Ford F150 | 371.60 | $ | 705.75 | 19.79 | $ | 34.40 |
| 800 | 2003 | Ford Crown Vic | 55.05 | $ | 98.22 | 1,955.40 | $ | 3,726.66 |
| 801 | 2003 | Ford Crown Vic | 34.96 | $ | 64.08 | 1,990.92 | $ | 3,815.24 |
| 806 | 2003 | Ford Crown Vic | 27.95 | $ | 50.46 | 1,692.13 | $ | 3,156.59 |
| 808 | 2003 | Ford Crown Vic | 55.08 | $ | 105.31 | 1,546.31 | $ | 2,884.56 |
| 809 | 2003 | Ford Crown Vic | 120.79 | $ | 219.72 | 2,051.38 | $ | 3,744.24 |
| 812 | 2003 | Ford Crown Vic | 60.38 | $ | 108.97 | 2,123.95 | $ | 3,924.15 |
| 819 | 2003 | Ford Crown Vic | 57.90 | $ | 109.69 | 2,062.50 | $ | 3,776.75 |
| 821 | 2003 | Ford Crown Vic | 24.33 | $ | 41.48 | 1,019.01 | $ | 1,949.04 |
| 1887 | 2003 | Chevrolet 1500 | 543.96 | $ | 1,041.59 | 0.00 | $ | - |
| 206 | 2004 | Chevrolet Silverado | 844.69 | $ | 1,616.24 | 58.14 | $ | 112.47 |
| 207 | 2004 | Chevrolet Silverado | 555.85 | $ | 1,081.62 | 22.50 | $ | 44.55 |
| 256 | 2004 | CRAFCO 200 | 9.52 | $ | 20.53 | 0.00 | $ | - |
| 334 | 2004 | Chevrolet Silverado | 0.00 | $ | - | 139.33 | $ | 274.85 |
| 403 | 2004 | Chevrolet Silverado | 36.32 | $ | 62.59 | 640.71 | $ | 1,220.88 |
| 501 | 2004 | Chevrolet Impala | 11.79 | $ | 221.21 | 99.34 | $ | 193.73 |
| 803 | 2004 | Ford Crown Vic | 162.81 | $ | 296.06 | 1,804.66 | $ | 3,483.77 |
| 804 | 2004 | Frod Crown Vic | 169.08 | $ | 312.17 | 3,319.91 | $ | 6,404.46 |
| 805 | 2004 | Ford Crown Vic | 158.01 | $ | 276.77 | 3,261.43 | $ | 6,253.99 |
| 807 | 2004 | Ford Crown Vic | 81.20 | $ | 152.22 | 2,217.81 | $ | 4,145.90 |
| 810 | 2004 | Ford Crown Vic | 96.93 | $ | 177.59 | 3,587.66 | $ | 6,869.73 |
| 817 | 2004 | Ford Crown Vic | 52.48 | $ | 93.17 | 2,910.16 | $ | 5,548.03 |

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|---|---|---|---|---|---|---|---|---|
| 820 | 2004 | Ford Crown Vic | 90.75 | $ | 169.52 | 3,102.66 | $ | 5,945.02 |
| 835 | 2004 | Chevrolet Impala | 25.91 | $ | 53.56 | 144.42 | $ | 273.13 |
| 842 | 2004 | Harley FLHPI | 0.00 | $ | - | 10.56 | $ | 20.44 |
| 843 | 2004 | Harley FLHPI | 7.12 | $ | 13.44 | 414.80 | $ | 811.01 |
| 852 | 2004 | Chevrolet Impala | 11.49 | $ | 22.75 | 258.13 | $ | 488.73 |
| 854 | 2004 | Chevrolet Impala | 8.69 | $ | 18.64 | 506.27 | $ | 977.92 |
| 865 | 2004 | Chevrolet Impala | 21.06 | $ | 41.94 | 558.76 | $ | 1,071.36 |
| 1040 | 2004 | Ford F150 | 104.28 | $ | 217.16 | 167.94 | $ | 307.14 |
| 1688 | 2004 | Ford F150 | 4.33 | $ | 8.62 | 994.34 | $ | 1,907.51 |
| 1889 | 2004 | Ford F150 | 291.69 | $ | 564.72 | 21.22 | $ | 42.02 |
| 300 | 2005 | Chevrolet Impala | 13.22 | $ | 26.18 | 83.10 | $ | 169.96 |
| 811 | 2005 | Ford Crown Vic | 12.40 | $ | 26.60 | 1,333.63 | $ | 2,748.38 |
| 813 | 2005 | Ford Crown Vic | 7.45 | $ | 16.06 | 1,670.54 | $ | 3,423.66 |
| 814 | 2005 | Ford Crown Vic | 22.38 | $ | 45.76 | 1,441.34 | $ | 2,955.85 |
| 816 | 2005 | Ford Crown Vic | 6.89 | $ | 13.64 | 1,508.26 | $ | 3,073.15 |
| 822 | 2005 | Ford Crown Vic | 12.53 | $ | 26.87 | 1,019.54 | $ | 2,091.59 |
| 823 | 2005 | Ford Crown Vic | 21.17 | $ | 44.20 | 855.97 | $ | 1,741.47 |
| 863 | 2005 | Chevrolet Colorado | 0.00 | $ | - | 376.49 | $ | 760.15 |
| 1571 | 2005 | Chevrolet 1500 | 0.00 | $ | - | 181.31 | $ | 369.33 |
| 1882 | 2005 | Ford F250 | 135.01 | $ | 277.74 | 104.14 | $ | 206.84 |
| 216 | | Chevrolet 1500 | 441.78 | $ | 851.60 | 27.62 | $ | 59.55 |
| | | | 22,316.66 | $ | 42,967.61 | 82,190.42 | $ | 158,072.56 |

| Department | Year | Make | Unleaded | | Cost | Ethanol | | Cost |
|---|---|---|---|---|---|---|---|---|
| 4 City Main | 2000 | Department, Misc | 35.37 | $ | 64.41 | 0.00 | $ | - |
| 199 Utility | 2001 | Department Mis | 185.25 | $ | 358.38 | 185.21 | $ | 371.17 |
| 299 Street | 2001 | Department, Misc | 332.79 | $ | 648.70 | 44.16 | $ | 86.17 |
| 399 Parks | 2000 | Department, Misc | 2,581.16 | $ | 5,055.43 | 89.71 | $ | 188.12 |
| 599 Fire | 2000 | Department, Misc | 143.12 | $ | 271.69 | 47.20 | $ | 93.29 |
| 799 | 2000 | Department Mis | 0.00 | $ | - | 51.62 | $ | 92.17 |
| 836 Police | 2001 | Unkown, Unkown | 21.53 | $ | 39.59 | 1,291.78 | $ | 2,481.65 |
| 949 | 2000 | Department Misc | 56.68 | $ | 103.18 | 0.00 | $ | - |
| | | | $ 3,355.90 | $ | 6,541.38 | $ 1,709.68 | $ | 3,312.57 |
| | | | **25,673** | **$** | **49,508.99** | **83,900** | **$** | **161,385.13** |