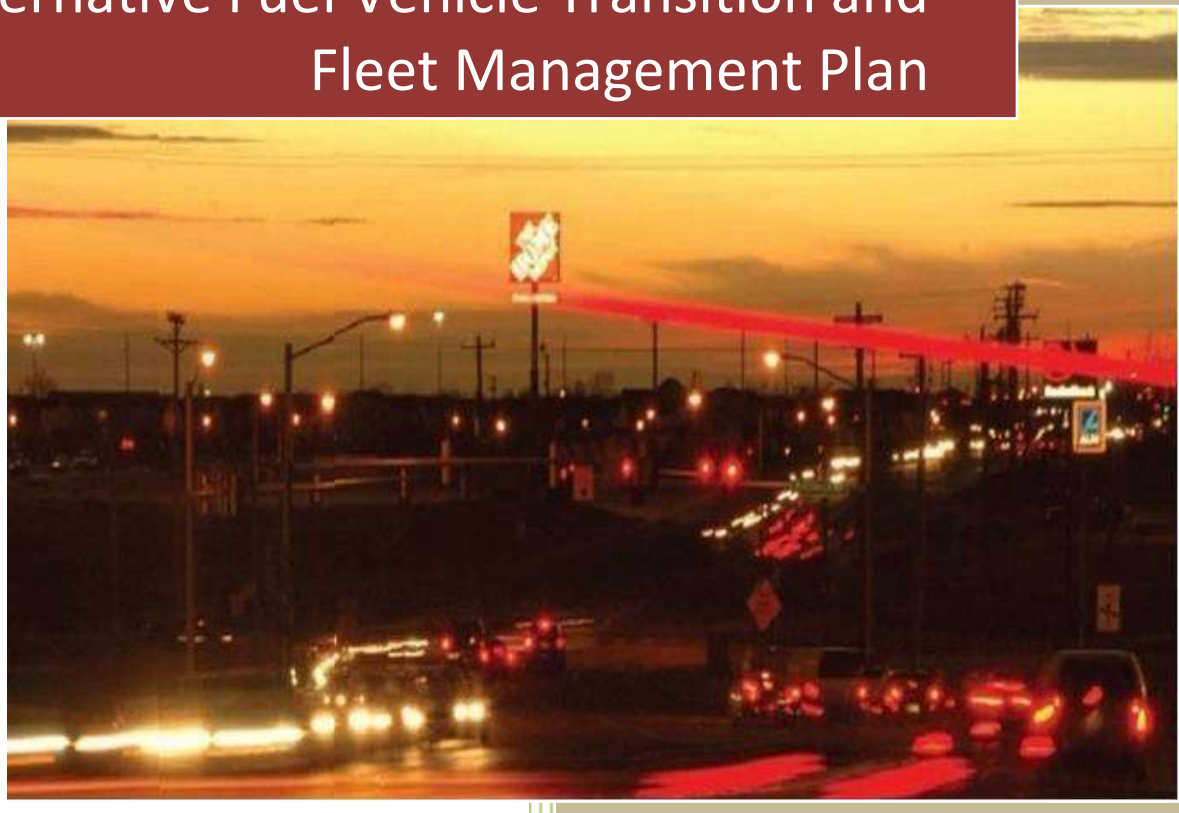
2011

City of Moore
Alternative Fuel Vehicle Transition and Fleet Management Plan



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City of Moore Alternative Fuel Vehicle Transition and Fleet Management Plan

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Section 1: Introduction

The City of Moore was awarded a $454,200 Energy Efficiency Block Grant (EECBG) from the Department of Energy on August 28, 2009. By securing EECBG funds, the City of Moore has a stake in advancing energy efficiency and conservation practices. The EECBG funds are being used to reduce municipal expenditures and provide lasting benefit to the City of Moore.

In addition, the City of Moore also obtained a $130,000 State Energy Efficiency Block Grant (SEECBG) from the Oklahoma Department of Commerce on September 21, 2009. The City of Moore saw this grant as an opportunity to build on past grant awards to increase the energy efficiency of City operations, as well as working to reduce overall emissions and educate the public on alternative energy sources. The SEECBG funds were obtained to address the use of alternative fuels within the City's fleet; a portion of the grant funding was allocated to update the City's existing Energy Efficiency and Conservation Strategy (EECS) with an evaluation of the City's vehicle fleet inventory and the development of the ALTERNATIVE FUEL VEHICLE TRANSITION AND FLEET MANAGEMENT PLAN.

EECBG-funded energy efficiency retrofits

The City of Moore is not mandated by any state or federal regulations to purchase alternative fuel vehicles (AFVs) or utilize alternative fuels in their vehicle fleet inventory. The City does realize the significance of available alternative fuel options through purchasing decisions that affect operations, maintenance, fiscal planning efforts, and community stewardship.

Regional Significance

The City of Moore is located within the metropolitan planning organization (MPO) known as the Association of Central Oklahoma Governments (ACOG). ACOG is the nation's 48th official U.S. Department of Energy Clean Cities program and coalition. This designation was received in May 1996. The Central Oklahoma Clean Cities program represents a metropolitan region that encompasses four counties. More than 40 government agencies and businesses participate in the Central Oklahoma Clean Cities program.

Oklahoma City rush hour during an air quality alert

Central Oklahoma Clean Cities "is dedicated to reducing petroleum dependence in the transportation sector, improving air quality, expanding domestic alternative fuel use and accelerating deployment of advanced technology vehicles." This program serves as a regional resource available to the City of Moore as they progress in transitioning their vehicle fleet inventory to be more fuel efficient and fiscally conscious.

Section 2: Study Methodology

Overall Approach

The City of Moore has been facing rising expenditures for fuel and vehicle maintenance costs. A basic review of the various options for purchasing, operating, and maintaining vehicles was desired, along with guidance for future decisions. As a result, the ALTERNATIVE FUEL VEHICLE TRANSITION AND FLEET MANAGEMENT PLAN has been developed.

The report includes spreadsheet tools and results with recommendations and timelines based on preferred actions. The report reflects input from multiple stakeholders within the City and is intended to be a realistic approach to reducing costs and increasing efficiency. It aligns with the City's current EECS and includes recommendations for long-term fleet management practices and policies.

The first step of the plan is to gather information related to the City of Moore's current vehicles, operating costs and policies, and vehicle purchasing policies. Types of alternative-fueled vehicles, fuel saving strategies, and fleet management options were also investigated. The next steps in the development of the plan are Goal Development, Data Analysis, and Recommendations.

Data Collection

General Vehicle Inventory

An inventory of the on-road vehicles currently owned and operated by the City of Moore was developed as a baseline. Once the general information was gathered, several meetings were held with the City's administration, department heads, and fleet maintenance staff to discuss the data and review in detail. The City of Moore's on-road fleet consists of 175 vehicles, primarily cars and trucks. All vehicles reported are owned and maintained by the City.

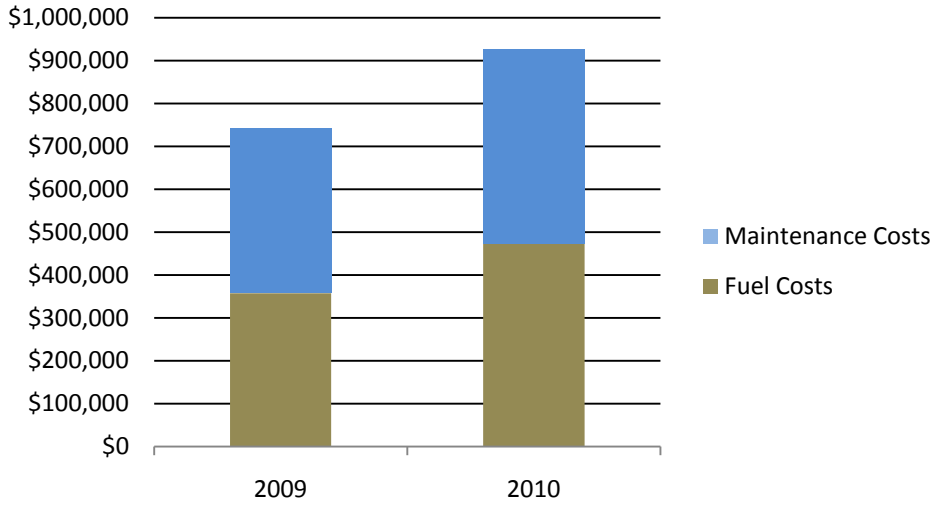
ON ROAD VEHICLE SUMMARY	Total	Gasoline Powered	Diesel Powered
Light Duty Vehicles (Classes 1-2)			
Autos	**58**	**58**	
Trucks- F150, F250, 1500, 2500, Rangers, Dakotas	**45**	**43**	**2**
SUVs	**20**	**20**	
Passenger Van, Step Van	**2**	**1**	**1**
Medium Duty Vehicles (Classes 3-6)			
Trucks - F350 - F650; GM 3500-6500	**20**	**15**	**5**
Heavy Duty Vehicles (Classes 7-8)			
Fire Apparatus	**9**	**1**	**8**
Heavy/Dump Trucks	**8**		**8**
Waste Trucks	**12**		**12**
Street Sweepers	**1**		**1**
ON ROAD Total	**175**	**138**	**37**

Operating Costs

In 2009, the City of Moore spent $741,683 on their vehicle fleet ($357,288 on fuel consumption and $384,395 on vehicle repairs, including parts and maintenance). In 2010, the City of Moore spent $926,706 on their vehicle fleet ($472,345 on fuel consumption and $454,361 on vehicle repairs, including parts and maintenance). The increase of $115,057 represents a 33% increase in vehicle fuel costs between 2009 and 2010, and costs are expected to continue to increase.

The City's budget planning efforts for 2011 recognize the importance of accounting for rising petroleum fuel costs and an aging vehicle fleet, therefore evolving the City's actions to be more energy efficient and fiscally conservative will help to manage these costs.

2011 gas prices in Moore



Vehicle Repair, Maintenance, and Purchasing Procedures

With 175 on-road vehicles in the City's current vehicle fleet inventory, Moore's vehicle fleet management and operations maintains a distinctive and efficient process to keeping the City's vehicles on the road. All City-owned vehicles receive maintenance based on operational time on the road or mileage accumulated ('hours run').

The attrition of City vehicles is an average of every six to ten years but depends upon the mileage, wear and tear, and overall status of vehicle. City street sweepers are the exception to this rule as they have a definitive attrition rate of every six years, and City Police automobiles have an attrition rate of every five years. In some instances, instead of attrition, some vehicles are repurposed for a less intensive, less frequent use through a transfer to another City department.

In other instances, older vehicles are placed in the City staff motor pool for use by employees on an 'as-needed, signed check out' basis. Trucks that are no longer in use are sometimes utilized for parts, providing value to other City trucks still in operation. Otherwise, City on-road vehicles that are not in use will be sent to the local auction to be sold for their current value.

Over the past 10 years, the Fleet Maintenance Division of the City of Moore Public Works Department has developed an informal vehicle replacement program in an effort to standardize the fleet. The standardization of the fleet has resulted in reducing parts inventory, allowing for greater mechanical expertise and reduced parts costs. The costs associated with implementing the vehicle replacement program was a significant capital expenditure from 2000-2010.

The City of Moore typically uses the general fund to purchase new vehicles. Most vehicles are purchased through the State Contract.

The City of Moore currently has employed 6 employees for the Vehicle Maintenance Division who are responsible for the purchasing, maintenance, and de-commissioning of all 175 on-road vehicles. City mechanics have completed training by the National Institute of Automotive Service Excellence in Alternative Fuels, and have obtained the ASE F1 certification.

Fuel Usage and Purchasing

The City of Moore utilizes the "Fuelman Card", a third-party fuel credit card. Each vehicle is issued a Fuelman Card for fueling, with a unique ID number issued for each vehicle. The Fuelman Card works to control city expenses by monitoring fuel purchases, fuel efficiency, and vehicle maintenance. The Fuelman Card program automatically deducts taxes from fuel purchases, and provides regular reports to help maximize the fuel efficiency of each vehicle. The Fuelman Company estimates that government accounts save approximately 10% of fuel costs by using the Fuelman Cards as opposed to those that have no fuel management program.

Vehicle Assignments and Use Policies

Based on job requirements, some City vehicles are assigned to staff that are allowed to take home their vehicles. Each department has a certain number of vehicles based on their requirements. With 56 automobiles and four motorcycles, the City police department uses approximately 2/3 of the City's annual vehicle operations, maintenance and fuel budget.

The City motor pool has at least three vehicles available for use by all City staff that may need a City vehicle to meet their daily job requirements. A City employee that is not assigned a vehicle for their job may sign up and check out a vehicle from the City motor pool at any time a vehicle is needed, based on availability.

Availability and Appropriateness of Alternative Fuel Vehicles (AFVs)

In beginning a transition from a traditional fleet to a green fleet, the City of Moore considered several technologies:

Bio-fuels: Because of the complicated logistics in obtaining and maintaining the specialty fuel in sufficient quantities and timeliness to rely upon the fuel as a sole fueling source for vehicles, it has

been determined that Bio-fuel is not a realistic option for the City's alternative fuel vehicles.

Electric: The City's fleet is heavily used by medium-heavy users. Even light-duty job tasks may require the ability to haul equipment. It has been determined that electric vehicles are not viable at this time for the regular city fleet, however, these types of vehicles should be considered for designated specialty duty vehicles, such as special events and the Recycle Moore Center vehicle.

Diesel Truck Retrofits: Retrofitting diesel vehicles with emission control devices, such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs) can reduce particulate emissions by 30 to 90%.

- A DOC is a device with a honeycomb-like structure that oxidizes pollutants in the exhaust stream, thereby reducing harmful emissions. Diesel vehicles considered eligible for DOCs have pre-2002 engines and must have exhaust systems in good enough condition to accommodate the DOC, and will typically be kept in the fleet for at least 3 more years.
- A DPF is a ceramic device that collects the particulate matter in the exhaust stream and breaks it down into less harmful components. DPFs reduce emissions of particulate matter by 60-90%. Diesel vehicles considered eligible for DPFs must be high-use vehicles that will remain the fleet for at least 4- 5 more years and that typically have a higher dollar value. In order to be eligible for a DPF, the vehicle must have an electronically controlled engine that accommodates a DPF.

City maintenance staff voiced concern with diesel retrofit technology. A vehicle must be 10 years old for a DOC, making the investment difficult to justify. DPFs present challenges since they are intended for highway driving, whereas city vehicles are used mainly for local trips.

Ethanol (E85): E85 is a blend of 85% ethanol and 15% gasoline. It is used to fuel E85-capable flexible fuel vehicles (FFVs) which are available in a variety of models. The benefit to an FFV is that it can be fueled with more than one type of fuel. E85 is advantageous because it is manufactured predominantly in the United States and is cleaner burning than gasoline. E85 results in lower fuel economy and is not currently available in Moore. FFVs utilizing E85 may be an option for certain vehicles in the fleet, including sport utilities and police cars.

Compressed Natural Gas (CNG): CNG vehicles emit fewer nitrogen oxides and less particulate matter than gasoline-powered vehicles. CNG is also roughly 1/3 of the price of gasoline or diesel. The City of Moore currently does not have any CNG vehicles in the fleet. Natural gas is an abundant commodity in Oklahoma, and provides a financially-competitive option to petroleum-based fuels for vehicles. Because Oklahoma is a top producer of natural gas, there is high promotion of this type of fuel from both the private sector (Chesapeake Energy and others) and from the State of Oklahoma. The main challenge of this fuel type is the infrastructure necessary to fuel vehicles.

Although there are more fueling stations being built to offer CNG for commercial fueling, it is still not in widespread use. Recent efforts by the City to obtain grant funding or incentivizing private entities to construct a private fuel station have been unsuccessful because of existing fuel station in relative "close proximity" (Norman and Oklahoma City) to Moore. Although the lack of fueling stations for CNG makes this alternative fuel unviable for the majority of the City's fleet, an existing public CNG station is located at the ONG Southside Service Center, 412 SE 59th Street. This location is in close proximity to the Southeast Landfill, presenting an excellent opportunity for CNG sanitation trucks.

Private development of a CNG station within the City of Moore would be encouraged by the City. If a station is developed with the City, CNG would become a competitive fuel source for other trucks and sedans in Moore's vehicle fleet.

Hybrid-Electric Vehicle (HEV): HEVs use a battery to generate electricity that powers the car in certain situations, while a traditional gasoline-powered engine provides power in other situations. The result is a car that receives exceptional fuel efficiency and releases fewer air emissions than a traditional vehicle. The City of Moore currently has no HEV in the fleet. The HEV technology has made great strides in the past several years, with multiple car manufacturers offering HEVs in their product lines. City staff has identified HEV as an emerging technology with many potential benefits for the city's operations.

Section 3: Goal Development

Goals were developed to guide the ALTERNATIVE FUEL VEHICLE TRANSITION AND FLEET MANAGEMENT PLAN. The overarching directive from City staff is to maximize fuel efficiency and conservation in order to decrease operational and maintenance costs over the lifetime of the vehicle. On a regional and national level, staff includes the goals of 1) minimizing air quality impacts and 2) reducing imports of foreign oil as contributing motives for the planning effort.

Goals:

- Reduce annual fuel expenditures
- Reduce the use of petroleum-based products and dependence on foreign oil
- Positively impact air quality by reducing emissions
- Further standardize and streamline policies related to vehicle purchases and operations
- Achieve fleet transition while maintaining efficiency of fleet maintenance operations
- Demonstrate energy efficiency and environmental stewardship to the community
- Provide driver education and training to improve safety, reduce wear and tear, and increase fuel economy

Measurement:

This plan considers gallons of gasoline/diesel used and CO2-equivalent emission reduction as the indicator for meeting the stated objectives, as compared to the business-as-usual scenario. The City of Moore's goals include:

- Reduction of the barrels of oil used annually by **5%** based on the 2010 GREET baseline (see Section 4, Data Analysis)
- Reduction of CO2 equivalent emissions of **5%** annually based on the 2010 GREET baseline (see Section 4, Data Analysis)

The City of Moore will increase interdepartmental awareness of the City's vehicle fleet and the costs and impacts associated with operations through this planning effort. The City will adopt this plan to serve as a guide for future decision-making. The ALTERNATIVE FUEL VEHICLE TRANSITION AND FLEET MANAGEMENT PLAN provides support and justification for on-going implementation of the fleet transition through grant funding or general operational funding.

Section 4: Data Analysis

In the winter of 2010 and spring of 2011, staff responses to surveys and inquiries were gathered. An analysis of findings from city staff regarding requirements and needs for vehicle usage was reviewed to accurately identify the City's current on-road vehicle fleet inventory. Several meetings were conducted with the City of Moore's manager of vehicle fleet operations and City administration to review the findings as well as discuss the resulting analysis.

Modeling

Quantitative analysis of the current City of Moore Fleet was performed in order to gain a better understanding of the costs and impacts associated with operations. The vehicle fleet inventory data gathered from the City was sorted into designated categories based on fuel and type of vehicles. Once this was complete, City administration and fleet management conducted a review of the categorical data to insure accuracy in what was reported by each City department.

The data was then input into a nationally-recognized model developed by the Department of Energy (DOE) and Clean Cities called "GREET Fleet Footprint Calculator". **GREET** stands for **G**reenhouse gases, **R**egulated **E**missions, and **E**nergy use in **T**ransportation. The GREET model is used by Clean Cities across the United States and recognized as a "best management practice".

GREET is a fuel-cycle model which generates necessary petroleum use. It also assigns a greenhouse gas (GHG) emission co-efficient based on key fuel production pathways and combustion fuel types once vehicle fleet information is entered. The outcome is a quantitative analysis of fuel consumed and emissions released on an annual basis by the vehicle inventory. The complete GREET Fleet calculator outputs for the City of Moore are included in the appendix.

Findings

GREET Analysis – Baseline

The GREET model revealed the City's existing on-road vehicle fleet petroleum usage annually was 9,080 barrels of oil. While the yield of crude oil depends on quality, generally one barrel of oil yields about 42 US gallons of gasoline, or 21%-35% of the total barrel of oil. The average cost per gallon of petroleum-based fuel in the state of Oklahoma since 2008 is $3.65, according to AAA.

The average cost per gallon of CNG (compressed natural gas) in the state of Oklahoma is $1.30 per gallon (source: 2011 Oklahoma Journal Record). It is certain that petroleum fuel costs will continue to rise in 2011 and into the future, and the City could see a 50%-75% increase in petroleum fuel costs in the next 5 years unless they transition to an alternative fuel such as CNG.

Based on the GREET Fleet calculator, the City of Moore's current on-road vehicle inventory annually emits 4,964 short tons of CO_2 equivalent. Equivalent CO_2 (CO_2e) is the concentration of CO_2 that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas. Examples of such greenhouse gases are methane, perfluorocarbons and nitrous oxide. CO_2e is expressed as parts per million by volume (ppmv).

According to GREET, the average car travelling 12,000 miles per year contributes 5.8 metric tons of CO_2e to the atmosphere from tailpipe emissions. 5.8 metric tons equates to 6.39 short tons. Adding 4,964 short tons of CO_2e per year from the City's overall on-road vehicle fleet is **equivalent to adding 777 cars to the road**.

BASELINE GREET ANALYSIS

7. Results of On-Road Fleet's Petroleum Usage (barrels)

	Gasoline	Diesel	Diesel HEV	B20	B100	E85	CNG	LNG	LPG	Electricity	G.H2	L.H2	Vehicle Total
School Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shuttle/Paratransit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste Hauler	0.0	2563.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2563.0
Street Sweeper	0.0	71.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.9
Delivery Step Van	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8
Transport/Freight Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium/Heavy Duty Pickup Truck	0.0	804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	804.1
Maintenance Utility Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (Class 1 + Class 2 Vehicles)	5464.3	146.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5611.0
Fuel Total	5,495.1	3,585.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

On-Road Fleet Total **9,080.7 barrels of oil** **381,389 gallons of petroleum**

8. Results of On-Road Fleet's Greenhouse Gas Emissions (short tons CO2-equivalent)

	Gasoline	Diesel	Diesel HEV	B20	B100	E85	CNG	LNG	LPG	Electricity	G.H2	L.H2	Vehicle Total
School Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shuttle/Paratransit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste Hauler	0.0	1,408.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1408.1
Street Sweeper	0.0	39.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5
Delivery Step Van	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8
Transport/Freight Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium/Heavy Duty Pickup Truck	0.0	441.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	441.7
Maintenance Utility Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (Class 1 + Class 2 Vehicles)	2977.3	80.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3057.9
Fuel Total	2,994.1	1,969.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

On-Road Fleet Total **4,964.0 short tons of GHG emissions**

GREET Analysis – Short Term Snapshot

A Snapshot evaluation was prepared to view the impact of adding two CNG-fueled refuse trucks to the City's fleet. These vehicles are currently pending, and would enhance the City's refuse collection operations. The updated GREET calculations reflect a slight increase in GHG emissions, with no increase in barrels of oil consumed. Note that the Short Term Snapshot GREET Analysis does **not** retire any current refuse vehicles from the fleet, due to potential increases in service area. As old trucks are phased out, fuel consumption and GHG emissions would decrease.

GREET ANALYSIS – SHORT-TERM SNAPSHOT

7. Results of On-Road Fleet's Petroleum Usage (barrels)

	Gasoline	Diesel	Diesel HEV	B20	B100	E85	CNG	LNG	LPG	Electricity	G.H2	L.H2	Vehicle Total
School Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shuttle/Paratransit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste Hauler	0.0	2563.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	2565.9
Street Sweeper	0.0	71.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.9
Delivery Step Van	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8
Transport/Freight Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium/Heavy Duty Pickup Truck	0.0	804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	804.1
Maintenance Utility Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	5464.3	146.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5611.0
Fuel Total	5,495.1	3,585.6	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	

On-Road Fleet Total **9,083.6 barrels of oil** **381,511 gallons of petroleum**

8. Results of On-Road Fleet's Greenhouse Gas Emissions (short tons CO2-equivalent)

	Gasoline	Diesel	Diesel HEV	B20	B100	E85	CNG	LNG	LPG	Electricity	G.H2	L.H2	Vehicle Total
School Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shuttle/Paratransit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste Hauler	0.0	1,408.1	0.0	0.0	0.0	0.0	231.5	0.0	0.0	0.0	0.0	0.0	1639.6
Street Sweeper	0.0	39.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5
Delivery Step Van	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8
Transport/Freight Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium/Heavy Duty Pickup Truck	0.0	441.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	441.7
Maintenance Utility Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	2977.3	80.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3057.9
Fuel Total	2,994.1	1,969.9	0.0	0.0	0.0	0.0	231.5	0.0	0.0	0.0	0.0	0.0	

On-Road Fleet Total **5,195.5 short tons of GHG emissions**

GREET Analysis – Five-year Projection

A five-year projection was prepared to view the impact of transitioning to AFVs for a portion of the City's fleet. These vehicles would replace existing fleet cars and trucks. The model was created to determine the fuel and emissions savings possible through this action. The updated GREET calculations reflect an increase in GHG emissions of 914 short tons for 2015 as compared with 2010. The main positive effect is a reduction of 2451 barrels of oil for the same time period.

GREET ANALYSIS – FIVE YEAR PROJECTION

7. Results of On-Road Fleet's Petroleum Usage (barrels)

	Gasoline	Diesel	Diesel HEV	B20	B100	E85	CNG	LNG	LPG	Electricity	G.H2	L.H2	Vehicle Total
School Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shuttle/Paratransit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste Hauler	0.0	640.8	0.0	0.0	0.0	0.0	15.9	0.0	0.0	0.0	0.0	0.0	656.7
Street Sweeper	0.0	71.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.9
Delivery Step Van	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8
Transport/Freight Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium/Heavy Duty Pickup Truck	0.0	662.2	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	663.1
Maintenance Utility Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	5016.4	146.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.6	0.0	0.0	5206.7
Fuel Total	5,047.2	1,521.5	0.0	0.0	0.0	0.0	16.9	0.0	0.0	43.6	0.0	0.0	

On-Road Fleet Total **6,629.1 barrels of oil** **278,422 gallons of petroleum**

8. Results of On-Road Fleet's Greenhouse Gas Emissions (short tons CO2-equivalent)

	Gasoline	Diesel	Diesel HEV	B20	B100	E85	CNG	LNG	LPG	Electricity	G.H2	L.H2	Vehicle Total
School Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shuttle/Paratransit Bus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste Hauler	0.0	352.0	0.0	0.0	0.0	0.0	1273.1	0.0	0.0	0.0	0.0	0.0	1625.1
Street Sweeper	0.0	39.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5
Delivery Step Van	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8
Transport/Freight Truck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium/Heavy Duty Pickup Truck	0.0	363.8	0.0	0.0	0.0	0.0	75.2	0.0	0.0	0.0	0.0	0.0	439.0
Maintenance Utility Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	2733.2	80.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	944.7	0.0	0.0	3758.6
Fuel Total	2,750.0	835.9	0.0	0.0	0.0	0.0	1,348.3	0.0	0.0	944.7	0.0	0.0	

On-Road Fleet Total **5,878.9 short tons of GHG emissions**

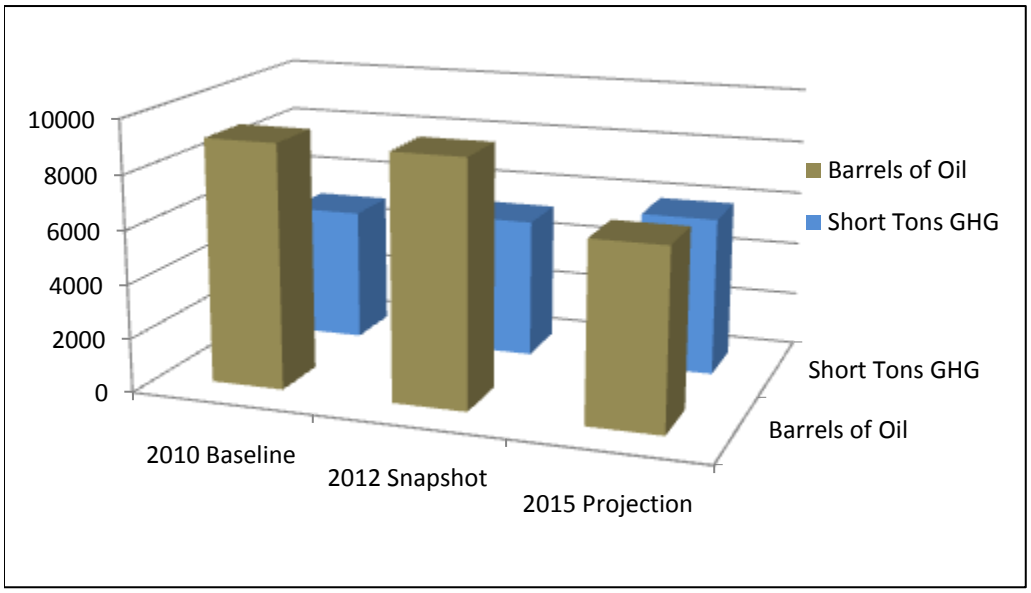
Summary of GREET Results

The GREET Models allow a projection of the potential impacts of transitioning the City of Moore's fleet to a mix of AFVs and standard vehicles over time. This analysis is an important consideration for addressing the City's goals and how best to achieve them in a fiscally responsible manner.

The proposed transition to alternative fuel vehicles (AFVs) does move the City of Moore toward achieving and exceeding the primary goal of reducing fuel expenditures. According to the GREET models, GHG emissions may increase slightly. The consultant team discussed our findings with the local Clean Cities coordinator, who confirmed the results and offered the following insight:

- The GREET calculator considers a full spectrum of fuel source emissions, also referred to as 'Well to Wheels'. This includes an accounting of the actual production of the fuel, refining, pipeline/delivery, and vehicle emissions.
- CNG delivers a specific benefit in terms of air quality by decreasing the Nitrous Oxide emissions, a key measure of air quality attainment
- Any fossil fuel source contributes to emissions. Consideration of CNG's domestic production is an asset not reflected in the model

Comparing the 2010 Baseline to the 2015 projection reflects a slight increase in GHG emissions. Measures beyond transitioning to AFVs will need to be employed to achieve the goal of reducing GHG emissions. These measures are outlined in Section 5: Recommendations that discusses improving driver habits, reducing idling time, and an effort to carpool and reduce miles travelled.



In summarizing the GREET models, it is important to clarify that the model assigns standard annual mileage to each vehicle. Comparing the City of Moore's actual fuel expenditures for 2010 to the expenditures projected in the GREET model results reveals that the GREET model

projections may be off by a factor of as much as two-thirds as compared to Moore's actual fuel consumption. This adjustment factor can also be applied to the GHG emissions.

The City of Moore's actual fuel expenditures for 2010 were equal to just 34% of the GREET model's projection. The City of Moore maintains many older vehicles in the fleet to offset the cost of short-term rental cars or for use in very specific situations. Assigning a typical annual miles travelled to each vehicle does not accurately reflect the actual use of these vehicles.

The model's projections have been adjusted by this 34% factor to provide a more tailored estimate of annual fuel savings. The estimated savings may be greater or less than the projection depending on a number of factors, including use of the fleet, fuel costs, and potential staffing changes as the City of Moore experiences continued growth.

The savings achieved by the City of Moore will likely vary substantially. The following table utilizes figures from the GREET model and adjusts expenditures to reflect actual conditions from 2010. The findings suggest that **the City of Moore could save approximately 34% of their current fuel expenditures** by maintaining the current number of vehicles and transitioning to 11 CNG waste haulers and 10 hybrid electric sedans. Actual savings may exceed this projection as other recommendations are implemented and as petroleum-based fuel costs increase.

Adjustment of GREET Projections as Compared to Actual Fuel Expenditures

YEAR	Gasoline (gallons)	CNG (equiv. barrels/oil)	CNG (gallons)	Electricity (equiv. barrels/ oil)	Electricity (Kwh)	**TOTAL FUEL COST**	**ADJUSTED FUEL EXPENDITURES** (equal to approx. 34% of model for 2010)
2010	381389	n/a	n/a	n/a			**ACTUAL 2010**
Unit cost	$3.65						
Subtotal	$1,392,070					**$1,392,070**	**$472,345**
2015	278422	16.9	710	43.6	148240		
Unit cost	$3.65		$1.30		$0.11		**ADJUSTED 2015**
Subtotal	$1,016,240		$923		$16,306	**$1,017,163**	**$345,135**
Projected Net Annual Fuel Savings of 27% over 2010 Expenditures, or approximately							**$127,210**

GREET MODEL – INDIVIDUAL VEHICLE REPLACEMENT STATISTICS:

Individual vehicle replacement statistics are included to assist the City in evaluating future vehicle purchases. The comparison vehicles are chosen to provide the most directly comparable substitution. Several comparisons identify other potential replacement vehicles, if greater savings are desired.

Estimated savings are based upon average annual miles driven as assigned by the GREET Model; actual data for the City of Moore was unavailable. Actual savings will depend on variables including miles driven and actual fuel costs.

Jeep Cherokee (Class 1)	HEV Ford Escape 4WD (Class 1)
15 mpg / 30,000 miles/yr	33 mpg / 30,000 miles/yr
Avg Annual Fuel Cost: $7,319 ($3.89/gallon)	Avg Annual Fuel Cost: $3,536 ($3.89/gallon)
1881 gallons per year	909 gallons per year
24.4 Short tons of GHG (CO2 Emissions)	94.5 Short Tons of GHG (CO2 Emissions)
Net Annual Savings: $3,782*	
This is a comparison of two very similar vehicles. Replacing a Jeep Cherokee with a hybrid sedan would provide higher fuel efficiency and thus generate greater savings	

Jeep Cherokee (Class 1)	CNG F150 Light Duty Truck (Class 1)
15 mpg / 30,000 miles/yr	11 mpg / 30,000 miles/yr
Avg Annual Fuel Cost: $7,319 ($3.89/gallon)	Avg Annual Fuel Cost: $3,490 ($1.28/GGE)
1881 gallons per year	2727 gallons per year
24.4 Short tons of GHG (CO2 Emissions)	118.7 Short Tons of GHG (CO2 Emissions)
Net Annual Savings: $3,829*	
The CNG F150 replacement vehicle can be utilized to replace other existing fleet vehicles including standard F150s to generate even greater savings.	

2002 Sanitation Truck (Class 7)	CNG Waste Hauler (Class 7)
2.5 mpg / 23,400 miles/year	2.0 mpg / 23,400 miles/year
Avg Annual Fuel Cost: $34,897 ($3.89/gallon)	Avg Annual Fuel Cost: $14,976 ($1.28/GGE)
8,971 gallons per year	11,700 gallons per year
117.3 Short tons of GHG (CO2 emissions)	115.7 Short tons of GHG (CO2 emissions)
Net Annual Savings: $19,921*	

1984 Chevy C-60 Dump Truck (Class 8)	CNG Medium Duty Truck (M2 or similar)
11 mpg (diesel) / 11,400 miles/year	9 mpg / 11,400 miles/year
Avg Annual Fuel Cost: $4031 ($3.89/gallon)	Avg Annual Fuel Cost: $1620 ($1.28/GGE)
1036 gallons per year	1266 gallons per year
13 Short tons of GHG (CO2 emissions)	12.5 Short tons of GHG (CO2 emissions)
Net Annual Savings: $2,411*	

Opportunities and Constraints

Opportunities and constraints were identified based on the GREET model output and calculation of the City's on-road City vehicle inventory as well as an analysis of the data obtained from meeting with City Staff.

Vehicle Repair, Maintenance, and Purchasing Policies

The City vehicle fleet operations and staff are just beginning to be trained to work on CNG alternative fuel vehicles. Furthermore, the City's maintenance facility is not currently stocked with parts to maintain a CNG alternative fuel vehicle. Much consideration was given to other

alternative fuels, such as E20 and B85, however, based on the City's current vehicle fleet inventory and maintenance requirements, they have selected to pursue CNG as their primary alternative fuel.

Budget allocations for vehicle fleet fuel, parts and maintenance are determined based on the allocations in the budget for these line items, the previous year(s) expenditures, and current costs in the marketplace, such as rising fuel costs. Currently, no quantitative projections are made for fuel costs, parts, operations and maintenance of the City's vehicle fleet. Projections would be helpful, since they would provide a strategy for managing and containing costs.

From the data gathered of City staff, including City administration and the manager of the City's vehicle fleet, the following on-road vehicles are within or over their attrition date based on operations, maintenance, and field requirements:

- 1980 Chevrolet Step Van, operated by Emergency Management
- 1984 Chevrolet Dump Truck, operated by Streets/Drainage-Public Works
- 1994 Jeep Cherokee, operated by Risk Management
- 1996 Chevrolet Corsica, operated by Building Maintenance

To effectively reach the goals identified in this alternative fuel vehicle transition plan, immediate consideration should be given to the removal and possible replacement of these on-road vehicles from the City's vehicle fleet. The GREET model for 2015 proposes replacing the Dump Truck, Jeep Cherokee, and Corsica. The Step Van is a specialized vehicle and is only used in cases of Disaster Response; therefore replacement would not likely be justified due to the very limited use.

Fiscal availability

Funding availability for City operations, including vehicle fleet inventories, is limited and sensitive to ongoing, annual budget allocations. Past practice has been to dedicate funding to update the vehicle fleet over a series of years, with no significant additional funding for on-going updating. This results in a fleet of vehicles that are all purchased in roughly the same time frame and will all be in need of replacement at roughly the same time.

In addition to the City's annual budget allocation for their vehicle fleet inventory, grants have become available from the Association of Central Oklahoma Governments (ACOG) and Clean Cities program. City staff has requested grant funds to use toward the purchase of CNG Sanitation Truck and hybrid electric sedans. Further grant funding opportunities are also being made available through the Department of Energy for the purchase of alternative fuel vehicles. These additional funding opportunities enable the City to maximize its annual budget allocations while extending resources to investing in AFV's.

Vehicle attrition

The City of Moore does not currently have a definitive policy or method for vehicle attrition. There are certain degrees of assessment in place for aging vehicles or vehicles that turn over more frequently, but there is not a policy that indicates what happens to those vehicles after they have been taken out of the City's vehicle fleet inventory for daily use. There are costs

associated with keeping a vehicle that may not be in frequent use. Determination of the cost and benefits associated with aging vehicle inventory, including annual insurance requirements, staff time to maintain the vehicle, storage, etc., is necessary to ensure efficient vehicle attrition is in place. A definitive policy should be adopted for vehicle attrition that addresses the end of service of a vehicle, next steps following the vehicle's end of service, and if vehicle replacements are made what type of fuel efficiency is considered in that purchase. Special consideration should be given to alternative fuel vehicles beyond purchase price alone.

Vehicle Assignments and Use Policies

During the data gathering and analysis process, several issues arose regarding management practices for the City's current vehicle fleet. These were a result of both quantitative data gathered through the modeling process and interviews with City staff. The issues have been noted below in detail based on their current status, and identified for future planning purposes as the City transitions their vehicle fleet inventory to alternative fuel vehicles.

The following is a detailed table of the City's current vehicle fleet inventory by department and vehicle class:

City Divisions	Total Vehicles	Percent of Fleet	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
Animal Control	5	2.9%		4	1					
Beautification	5	2.9%		2	3					
Code Enforcement	2	2.3%	2							
Emergency Mgt	1	0.6%		1						
Fire	21	12.0%	5	1	6					9
Fleet Maintenance	5	2.9%	3	1			1			
General Gov't	2	1.1%	2							
Inspections	3	1.7%	3							
Maintenance	2	1.1%			2					
Parks and Recreation	6	3.4%	1	4					1	
Police	72	41.1%	70	2						
Risk Management	1	0.6%	1							
Sanitation	15	8.6%		1	1				11	2
Sewer	6	3.4%	2	1			1		2	
Streets/Drain	17	8.6%	3	6		1	1	1	1	4
Water	12	6.9%	5	5	1			1		
TOTAL FLEET	**175**		**97**	**28**	**14**	**1**	**3**	**2**	**15**	**15**

'Right-Size' Vehicles

Over the past 10 years as the City has worked to update the fleet, a conscious decision was made to standardize the fleet with Ford F-150's for virtually all light-duty tasks. Although this creates some benefits for standardization through maintenance and parts efficiencies, it does

not further any goal of fuel efficiency as light-duty tasks that could be performed with a Class I vehicle are all being performed with a Class II vehicle, utilizing more fuel than necessary.

Driving Behavior

The City of Moore does not offer education or guidelines on proper driving behavior. Negative driving behavior affects the wear and tear of a vehicle and lowers the value of this investment for the City for that vehicle. The City does not have a policy or handbook on driving behavior that focuses on maintaining good 'wear and tear' of a vehicle through daily use, therefore City staff who utilize City vehicles are subject to their own decision making and driving behavior choices.

Fuel Efficiency

Calculating fuel efficiency of a vehicle is dependent upon the mechanics, model, and make-up of the vehicle, as well as driving behavior. Furthermore, fuel efficiency can be good or bad dependent upon how it's being measured. The City currently owns and operates 175 vehicles in their vehicle fleet inventory. Of those vehicles, 10-15% of them are rated as 'fuel efficient' vehicles.

Availability and Appropriateness of AFVs

As evidenced by the GREET model projections, AFVs provide an opportunity to reduce fuel expenditures. Assessing the integration of AFVs into the City's vehicle fleet inventory requires an analysis of the availability of the alternative fuel being considered. The City of Moore is interested in the availability of compressed natural gas (CNG) stations in order to transition to this type of AFV. Currently, there are no AFV fueling stations within the City boundaries, but there are several within a reasonable driving distance (less than 10 miles) and one strategically located near the landfill that the City refuse trucks travel to on a regular basis.

Alternative Fueling Stations within 10 miles of Moore, OK
Data from U.S. Department of Energy - Energy Efficiency and Renewable Energy
Alternative Fuels and Advanced Vehicles Data Center
Alternative Fuels Locator July 2011

KEY:

- Biodiesel (B20 and above)
- Compressed Natural Gas
- Ethanol (E85)
- Electric

Section 5: Recommendations

The Data Analysis provides insight into various options and potential outcomes. Recommendations based on the City's goals and objectives were identified, discussed and formulated with actions and timeframes. These recommendations serve as the basis for the City's adoption of this ALTERNATIVE FUEL VEHICLE TRANSITION AND FLEET MANAGEMENT PLAN, setting timeframes for goals to be met within short, mid and longer terms.

As the City of Moore works to transition its current vehicle fleet inventory to include AFVs and fuel efficient vehicles to the meet the most recent national fuel efficiency standards while reducing fuel costs and emissions, the management and maintenance of this fleet should be based on the following goals and actions provided in this plan through a formally designated City employee and/or office. These goals and actions can serve as guidelines for ongoing fleet management as well as annual updates on the City's progress towards transitioning their current fleet to one that is inclusive of alternative fuel, hybrid, and fuel-efficient vehicles.

Initial Actions

Beyond the creation of the ALTERNATE FUEL VEHICLE TRANSITION AND FLEET MANAGEMENT PLAN document, the City of Moore has already explored ways to be efficient with their vehicle fleet by addressing the management, operation and procurement of on road fleet vehicles. In 2010, Moore took a first step towards this effort with the purchase of two refuse trucks that operate on compressed natural gas (CNG). The City's new CNG refuse trucks will be in operation in 2011 and will be utilized throughout the City's weekly residential waste pick up schedule.

The City's refuse trucks were the obvious alternative fuel transition choice at this time because of the circular route they take to and from the landfill where there is an accessible CNG station for fueling. CNG typically costs between 25-50% less per mile of operation than gasoline or diesel. The City's long term goal is to work with a private entity to develop a CNG station within the City limits to make this alternative fuel more convenient for the City's vehicle fleet as well as the community.

Fleet Management and Maintenance

Fleet management should establish, implement and monitor the implementation of this plan while serving as the liaison for City Management and departments. Part of this effort to manage the City's current and future fleet inventory should include, but not limited, to the following:

- Establish, implement and monitor City fleet management guidelines
- Serve as liaison between City departments and fleet management related responsibilities
- Assist, within capabilities, in developing contracts to provide for acquisition of low emissions vehicles and other fleet related commodities and services
- Offer fleet management support through publications, City of Moore web site, City meetings, and other forms of communication as needed that are made available to City employees and the community
- Identify and share best business practices for fleet management activities

Within fleet management, current City fleet maintenance operations should grow to meet the needs of AFVs and hybrid vehicles included in future fleet inventory. At a minimum, this growth effort will mean that fleet maintenance operations will need to:

- Insure fleet maintenance staff is trained on the performance of hybrid and alternative fuel vehicles to ensure best operating standards for the vehicles
- Plan and budget for the necessary maintenance equipment to manage alternative fuel and hybrid vehicles within the operations facility
- Regularly attend fuel efficient, alternative fuel and hybrid vehicle training to be educated about the use and maintenance of these vehicles
- Communicate to all City employees who operate City-owned vehicles the requirements and expectations of driving behavior to maximize fuel efficiency
- Maintain accurate vehicle inventory logs with maintenance and repair information
- Post maintenance and operation information in City-owned vehicles to educate the driver on when and what to look for to maintain a well functioning vehicle
- Inspect each City-owned and operated vehicle on a regular basis not only for scheduled maintenance but also fuel efficiency and driver behavior indicators, such as fuel

Recommended Goals and Actions

The following are recommended goals and actions to be taken with the adoption and implementation of this plan. These are based on meetings with Staff, review of the data collected, modeling conducted, opportunities and constraints identified in Section 4, and best management practices for City owned and operated vehicle fleets.

The goals and actions have been divided into short-term (1-3 years), mid-term (3-5 years) and long-term (5-7 years), and assigned to departments who will be responsible for ongoing implementation and monitoring. Each timeframe has a corresponding table summarizing the goals and actions. These tables can be used to further evaluate the status of the City's actions for this plan on an annual basis, much like a self-assessment report card.

SHORT-TERM GOALS AND ACTIONS: 1-3 YEARS (2011-2014)

GOALS	ACTIONS	RESPONSIBLE DEPARTMENT	ANNUAL STATUS
Short-term 1-3 years			
Maximize fuel efficiency and reduce emissions output from City owned and operated vehicles.	Adopt a City "fuel conservation policy".	Purchasing / Public Works / Department Heads / City Management	
	Annually purchase alternative fuel (CNG) or hybrid vehicles.	Purchasing / Public Works / Dept. Heads / City Management	
	Adopt a 'no-idling' policy.	Fleet Maintenance	
	Implement a vehicle purchase justification process.	City Management	

	Implement 'Driver Behavior' education requirements.	Public Works / Dept Heads / City Management	
	'Right size' vehicles for use by City employees.	Public Works / Dept Heads / City Management	
	Revise the City motor pool to include on-road and off road vehicles and equipment in an effort to reduce the overall vehicle fleet inventory size, increase vehicle efficiency and use of maintenance facilities, through better utilization of City vehicles.	Public Works	
	Maintain accurate, organized, current records to establish a "baseline" and measure success from actions that are taken to reduce fuel use, costs, and emissions.	Public Works / Fleet Maintenance	

Goal: Maximize fuel efficiency and reduce emissions output from City-owned and operated vehicles.

Action: Adopt a City "fuel conservation policy". The purpose of this policy is to reduce fuel consumption, reduce pollution and greenhouse gases, and to create a greener Moore.
Responsible Departments: Purchasing / Public Works / Department Heads / City Management

Action: Annually purchase alternative fuel (CNG) or hybrid vehicles. As vehicles are being replaced for the City's fleet, make alternative fuel or hybrid a purchasing decision and requirement in procurement of any new City owned vehicles. Adopt green procurement language such as: *'Purchase better performing vehicles by assuring that as the City gets bids for new on-road and off-road vehicles, we seek vehicles that are fuel efficient and reduce emissions, and that we evaluate and pursue vehicles that operate on alternative or renewable fuel sources, when possible and practical.'*

The City should continue to focus on CNG as the primary alternative fuel for refuse trucks as well as other medium and heavy-duty trucks. Purchase of hybrid vehicles is an alternative to CNG vehicles, and should be considered when purchasing any light-duty vehicle. The City should also make it a priority to develop a CNG station within the City limits by 2014. The City staff motor pool should also have alternative fuel and hybrid vehicles.
Responsible Departments: Purchasing / Public Works / Department Heads / City Management

Action: Adopt a 'no-idling' policy. All City employees driving and operating City-owned vehicles must adhere to this policy. Provide educational information to City employees regarding this policy at the time they are either assigned a vehicle for their job role or borrow a vehicle from the City motor pool. Post notice of this policy, such as 'no idling' signage, throughout City offices and the Fleet Maintenance department as visual reminders to City staff.
Responsible Department: Fleet Maintenance

Action: Implement a vehicle purchase justification process. If budget constraints become a factor, and there are challenges to meeting the fuel efficiency measures set forth in this plan, City management should evaluate the use of vehicles assigned to City employees on a more specific basis.
Responsible Department: City Management

Action: Implement 'Driver Behavior' education requirements. City staff that drive City owned vehicles should receive annual training for the specific types of vehicles and equipment they use. This training should occur on an annual basis, and should be part of a City employee review process. During this training, City staff will be informed of the expected driving behavior to operate their assigned City owned vehicle, including the following:

- Correct fuel fill-up
- Tips for improving fuel economy in City owned vehicles (i.e. Clean Cities Tips)
- Checking daily for oil leaks and proper tire inflation

Mechanics and operations of the City's vehicle fleet must also go through this driver behavior training.
Responsible Departments: Public Works/Department Heads/City Management

Action: 'Right size' vehicles for use by City employees. Make the commitment to buying the right sized vehicle based on need, not employee desires. Ensure appropriate vehicle types and size for maximum efficiency for the job requirements assigned and duty performed. City staff identified 35 trucks in the current City owned and operated vehicle inventory fleet that can be replaced with alternative fuel or hybrid sedans.
Responsible Departments: Public Works/Department Heads/City Management

Action: Revise the City motor pool to include on-road and off road vehicles and equipment in an effort to reduce the overall vehicle fleet inventory size, increase vehicle efficiency and use of maintenance facilities, through better utilization of City vehicles. Utilization of rental contracts instead of purchasing/keeping old in-efficient cars and equipment is a more efficient and fiscally mindful choice for the City based on its employees needs and job requirements. The objective of the pool is to better utilize city vehicles, reduce maintenance and fuels costs, as well as increase vehicle efficiency and the use of maintenance facilities. The City would save money by renting certain vehicles rather than owning and maintaining them.
Responsible Departments: Public Works

Action: With the use of vehicle logs kept in the vehicle or windshield maintenance notification stickers, ensure regular maintenance on all municipal vehicles to increase fuel efficiency, reduce environmental impacts, and increase the life of the vehicle. Random inspections are encouraged so City employees are accountable for their assigned vehicle.
Responsible Departments: Public Works/ Fleet Maintenance

Action: Maintain accurate, organized, current records to establish a "baseline" and measure success from actions that are taken to reduce fuel use, costs, and emissions. It is critical to the success of this plan to ensure this baseline is kept up to date and accurate. Identification of a City staff person and ownership of this information by a City department would be key to the success of this. As this plan is reviewed on an annual basis to ensure the actions are being followed per the designated timeframes, this baseline information should be accounted for and referenced with this plan.
Responsible Departments: Public Works/Fleet Maintenance

MID-TERM GOALS AND ACTIONS: 3-5 years (2014-2016)

GOALS	ACTIONS	RESPONSIBLE DEPARTMENT	ANNUAL STATUS
Mid-Term 3-5 years (2014-2016)			
Over the next 3 years, increase vehicle use efficiency and increase efficient vehicles within the City vehicle inventory by 25% from the current City inventory.	Eliminate older vehicles that are not retrofitted or those that are not used frequently.	Public Works/ City Management	
	Research and purchase GPS devices to manage efficiency of vehicle fleet inventory.	Public Works/ City Management	

- **Goal:** Over the next 3 years, increase vehicle use efficiency and increase efficient vehicles within the City vehicle inventory by 25% from the current City inventory.

Action: Eliminate older vehicles that are not retrofitted or those that are not used frequently. Establish vehicle replacement policy of replacing vehicles every 7 years at a maximum, moving vehicle to motor pool for last 3 years at a maximum, disposing of vehicle after 10 years, maximum. Within this policy, identify the decision makers who will evaluate the replacement and purchase of new vehicles for the City fleet inventory. Also add definitive language such as *"include in budgetary process a line-item for vehicle replacement based on attrition of current vehicle fleet inventory".*

Action: Research and purchase GPS devices to manage efficiency of vehicle fleet inventory. GPS is an investment for the City vehicle fleet inventory and should be

added based on priority of vehicles to track fuel efficiency, driving behavior, operations and maintenance. Start with the most frequently used vehicles to add GPS devices, and then track accordingly. Add more devices each year over a 5-year period to ensure compatibility of devices and software.
Responsible Departments: Public Works/ City Management

LONG-TERM GOALS AND ACTIONS: 5-7 YEARS (2016-2018)

GOALS	ACTIONS	RESPONSIBLE DEPARTMENT	ANNUAL STATUS
Long-Term 5-7 years (2016-2018)			
Maintain and increase vehicle use efficiency as well as increase efficient vehicles within the City vehicle inventory by 25% from the current City inventory.	Develop a CNG station within the City's boundaries	City Management	
	Conversion of 75% of light duty, medium duty, and heavy-duty trucks to CNG, including diesel.	Public Works/ City Management	
	Require that contractors used for municipal projects also implement emission reduction strategies.	Purchasing	
	100% 'Right size' vehicles for use by City employees.	Public Works/ Dept Heads/ City Mgt	
	Maintain proper use, storage, disposal, and recycling of old parts and hazardous materials.	Public Works/Fleet Maintenance	
	Use environmentally responsible materials (e.g., alternative hydraulic fluids, recycled anti-freeze, eco-friendly cleaners, etc.) to maintain fleet	Public Works/Fleet Maintenance	

- **Goal:** Maintain and increase vehicle use efficiency as well as increase efficient vehicles within the City vehicle inventory by 25% from the current City inventory.

Action: Develop a fast fuel CNG station within the City's boundaries with a slow fuel option only available to City vehicle fleet. City leadership can support continued applications for grant funds to provide CNG fueling for both City and Commercial use. Additionally, the City should consider entering into a partnership with a private company in order to attain CNG fueling capabilities within the City
Responsible Departments: City Management

Action: Conversion of 75% of light duty, medium duty, and heavy-duty trucks to CNG, including diesel. Eventual conversion of the above categories of vehicles will standardize the fleet and provide ongoing savings to the City.
Responsible Departments: Public Works/ City Management

Action: Require that contractors used for municipal projects also implement emission reduction strategies. Add standard language to all of the City's construction contract or bid documents to ensure compliance. As needed provide the contractor with examples of what the City vehicle fleet inventory is doing to show precedence.
Responsible Departments: Purchasing

Action: 100% 'Right size' vehicles for use by City employees. All City owned and operated vehicles that are driven by City employees will be 'right sized', not what the employee desires. Ensure appropriate vehicle types and size for maximum efficiency for the job requirements assigned and duty performed.
Responsible Departments: Public Works/Department Heads/City Management

Action: Use environmentally responsible materials (e.g., alternative hydraulic fluids, recycled anti-freeze, eco-friendly cleaners, etc.) to maintain fleet. The City currently contracts with *January Environmental* to perform this action, so maintaining this contract, or with a similar company, as a long-term commitment is critical to the implementation of this plan.
Responsible Departments: Public Works/Fleet Maintenance

Section 6: Definitions

"Light-duty vehicles" any motor vehicle with a gross vehicle weight less than 14,000 pounds and includes all passenger vehicles (autos), pick-up trucks, vans, sport utility vehicles (SUV) and motorcycles

"Medium-duty vehicles" any vehicle with a gross vehicle weight between 14,001 and 26,000 pounds

"Heavy-duty trucks" any motor vehicle with a gross vehicle weight greater than 26,000 pounds and includes all Fire apparatus, dump trucks, snow plows, street sweepers and Refuse trucks

"Off-Road Construction" any vehicle not licensed for on-road use that is used primarily for construction purposes (backhoes, loaders, mixers, etc.)

"Off-Road Other" are smaller, motorized equipment (mowers, weed eaters, air compressors, etc.)

"Alternative fuel" any fuel that is substantially non-petroleum in nature, is not gasoline or diesel, and is defined as an alternative fuel by the U.S. Department of Energy

"Green Vehicle" refers to any vehicle that employs environmentally friendly technology to reduce either fuel consumption or emissions (i.e. hybrid, flex-fuel, CNG, equipped with after-treatment device, anti-idling device, auxiliary heating device, etc.)

"Diesel Oxidation Catalyst (DOC)" is a device with a honeycomb-like structure that oxidizes pollutants in the exhaust stream, thereby reducing harmful emissions.

"Diesel Particulate Filter (DPF)" is a ceramic device that collects the particulate matter in the exhaust stream and breaks it down into less harmful components.

"Biodiesel" fuel is a clean, renewable fuel, made by refining any fat or oil such as soybean oil. It is typically blended with petroleum diesel to create a biodiesel blend.

"Flex fuel" refers to a vehicle that can use either standard unleaded gasoline or E85, a blend of 15% gasoline and 85% ethanol. E85 comes from renewable, American resources like corn.

Section 7: Sources and Resources

Clean Cities: This site features program background and accomplishments, program news, and a toolbox (*www. cleancities.energy.gov*).

Alternative Fuels and Advanced Vehicles Data Center (AFDC): This comprehensive site provides detailed information on Clean Cities' five portfolio areas and has searchable databases of more than 3,000 documents and incentives and laws (*www.afdc.energy.gov*). Also available on the AFDC:

- **Vehicle Make/Model Search**— Look up specs on alternative fuel and advanced technology vehicles, trucks, and buses (*www.afdc.energy.gov/afdc/ vehicles*).
- **Alternative Fueling Station Locator**—Find fueling sites offering alternative fuels across the country (*www.afdc.energy.gov/stations*).

FuelEconomy.gov: This site compares gas mileage, emissions, air pollution ratings, and safety data for new and used vehicles.

EERE Information Center: This service provides assistance on energy efficiency and renewable energy topics. Inquiries requiring more technical expertise are forwarded to Clean Cities specialists (877-337-3463).

Central Oklahoma Clean Cities Program
http://www.okcleancities.org/

GREET Fleet Footprint Calculator
http://www.afdc.energy.gov/afdc/pdfs/greet_fact_sheet.pdf

Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle
http://www.epa.gov/oms/climate/420f05004.htm

Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010
http://www.epa.gov/oms/fetrends.htm