



# City of Ann Arbor Green Fleets Annual Report Fiscal Year 2006



## INTRODUCTION

The City of Ann Arbor, with a fleet of nearly 400 vehicles, recognizes that reducing the use of petroleum-based fuels contributes to national security by reducing our reliance on imported oil, contributes to the local economy by keeping dollars normally spent on imported fuels in the local economy and reduces transportation-based emissions that threaten public health and the global climate. On June 7, 2004 City Council adopted a Green Fleets policy to address these problems directly at the local level, as well as to lead by example for other municipalities, local fleets and individual drivers. The policy sets a goal of a **10 percent reduction in total gasoline and diesel use by 2012** and directs the City to purchase the most cost-effective and least polluting vehicles and fuel-using equipment that meet the City's needs. Projects such as "right-sizing" the fleet by reducing vehicle size and eliminating old and underused vehicles have already been implemented. Also, a Green Fleets Team annually reviews City vehicle purchase needs and provides input for purchase recommendations to City Council, assuring that factors such as fuel efficiency, ability to use alternate fuels and tailpipe emissions have been considered in vehicle procurement recommendations.

This report is a summary of progress achieved during the first two years of the City of Ann Arbor Green Fleets program. The baseline year to measure progress against was defined in the policy as FY2003.

## GREEN FLEETS OBJECTIVES

**Increase the fleet average fuel economy – make miles per gallon (mpg) a critical purchase criterion:** The City fleet's average fuel economy improved again in FY2006, from 17.6 to 17.8 mpg. The average fuel economy of vehicles added in FY2006 was 19.0 mpg, the same as the average fuel economy of vehicles added in FY2005.

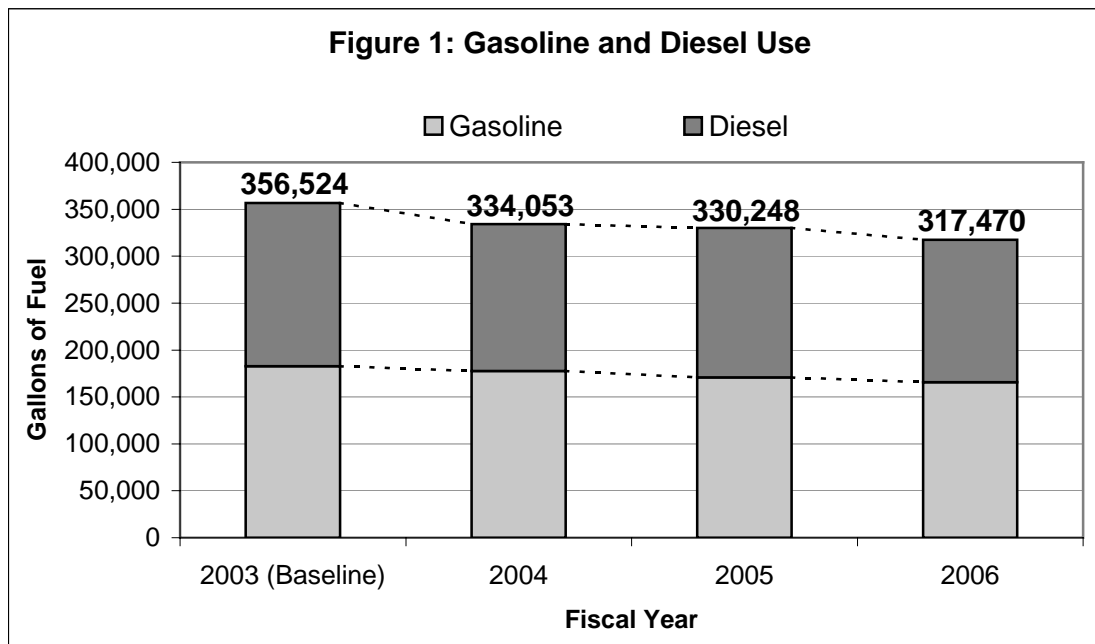
**Optimize the fleet size – eliminate unused or underused vehicles:** Five net vehicles were eliminated from the fleet in FY2006. This brings the fleet total down to 374 vehicles from its baseline (FY 2003) size of 420, a cumulative reduction of 11 percent.

**Increase the use of alternative fuel vehicles and equipment:** In FY2003, the City fleet had 150 alternative fuel vehicles (AFVs). This number increased to 178 in FY2005 and while it did not change in FY2006, it is expected to rise with the purchase and use of ethanol (E-85) flex-fuel vehicles in coming years. No flex fuel vehicles were purchased in FY2006 because, after Green Fleets Team review, none were available that met the City's needs.

However, the City's gasoline vehicles all have fueled with E-10, which is a blend of 10 percent ethanol and 90 percent gasoline since June 2006. While these are not technically AFVs, they will now contribute to our use of alternative fuels for FY 2007.

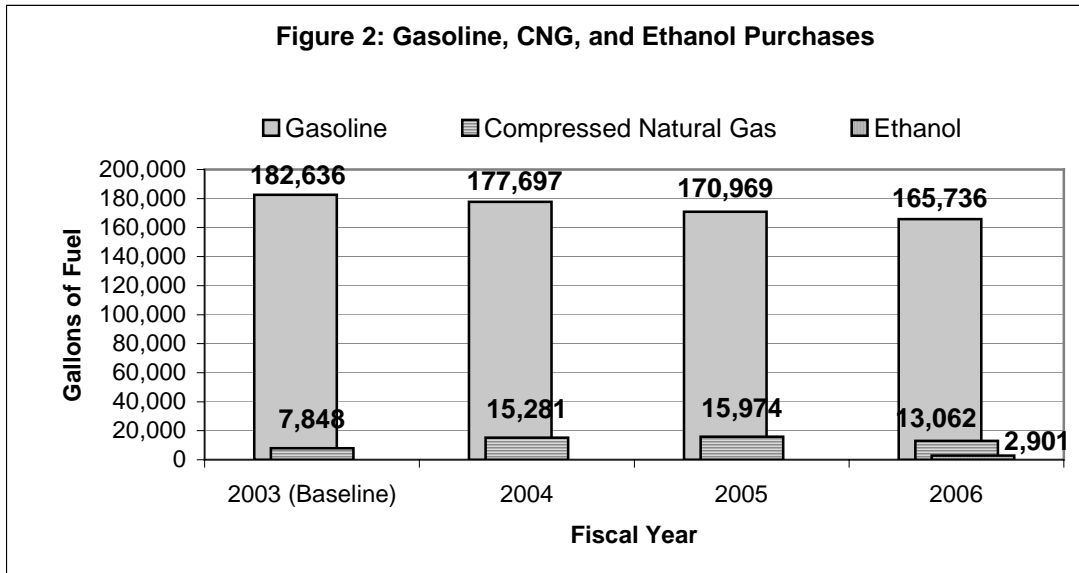
Also, while not affecting the results of this FY 2006 report, the City began fueling all diesel vehicles with a 50% biodiesel blend starting in July, 2006 and running through September before returning to a 20% blend to avoid gelling problems in colder weather. With this successful warm season ramp-up to 50% biodiesel versus the 20% blend we had been using, FY 2007 will show a significant increase in biofuel use.

**GREEN FLEETS MEASURES OF SUCCESS** - The primary measure of the City's success in accomplishing the above objectives is the decrease in annual total gallons of gasoline and diesel fuel used. The stated goal was to reduce gasoline and diesel use by 10% by 2012. **In the second year of the program gasoline and diesel use has decreased by 36,281 gallons from 356,524 in FY2003 to 317,470 in FY2006. This is an 11% decrease, which surpasses our 2010 goal of a 10% decrease.** Figure 1 shows the decrease in gasoline and diesel use since FY2003, which is the baseline for measuring change in fuel use.



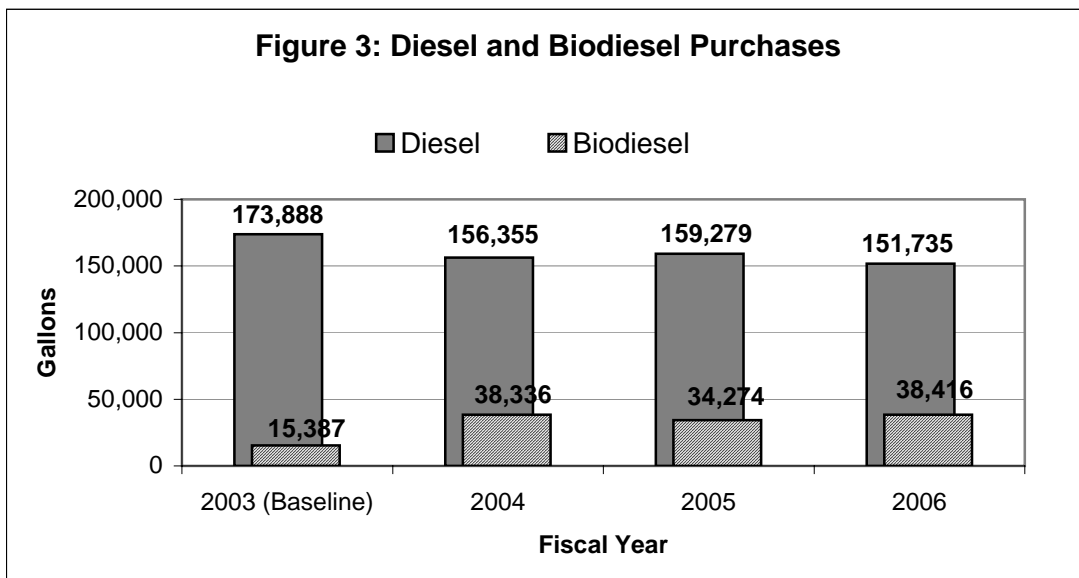
**Gasoline Reduction**

As Figure 2 below shows, City gasoline purchases declined each year from FY2003 to FY2006. The City purchased 182,636 gallons of gasoline in FY2003 and 165,736 gallons in FY2006, a decrease of 9 percent. Over this period, compressed natural gas purchases for vehicle use increased from by about 5,000 gallons, offsetting some gasoline use. Late in FY2006, the City started using 10 percent ethanol (E-10) in its gasoline vehicle fleet, which accounts for roughly another 3,000-gallon reduction. (Ethanol use is expected to increase in FY2007, which will be the City's first full year running E-10.) The rest of the decrease in gasoline use—about 8,750 gallons—is attributed to reduced vehicle miles traveled and increased fuel efficiency.



**Diesel Reduction**

Figure 3 shows diesel and biodiesel purchases since the FY2003 baseline. In 2001 the City began using a B-20 biodiesel blend (20% biodiesel and 80% regular diesel) in the summer months to reduce pollution and displace imported oil. As acceptable vehicle performance with B-20 was verified, the use of biodiesel was increased and starting in 2004 biodiesel (B-20) was used year round. Toward the end of FY2006, the City moved to 30 percent biodiesel (B-30) in preparation for a move to B-50 for the remainder of the 2006 summer. The City will return to B-20 for the winter to avoid the fuel viscosity issues associated with higher percentages of biodiesel.

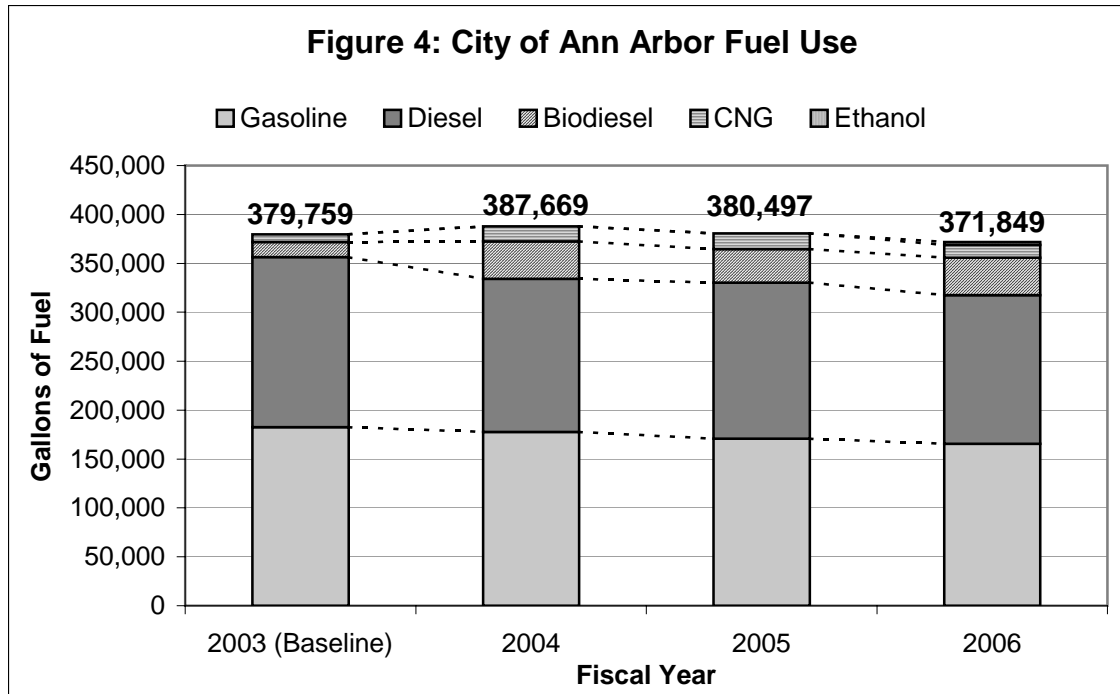


As a result of the increased biodiesel use, petroleum diesel use dropped from 173,888 gallons in FY2003 to 151,735 gallons in FY2006, a 13 percent reduction. Compared to the FY2003 baseline, the City used 22,153 fewer gallons of diesel and 23,029 more gallons of biodiesel in FY2006. Biodiesel use has increased from 8 percent of total

diesel fuel in FY2003 to 20 percent in FY2006. This number should increase again in FY2007 as the City expects to use B-50 for all of summer 2007.

**TOTAL FUEL PURCHASE**

Adding up all the fuels (gasoline, diesel, biodiesel, CNG and ethanol), total fuel purchases are down 9,268 gallons, from 379,759 gallons in FY2003 to 371,849 gallons in FY2006, a 2.1% decrease. While it is too soon to declare a clear trend, the City’s total fuel use does appear to be headed down from a FY2004 high of 387,669 gallon.



**CONCLUSIONS**

The Green Fleets program continues to exceed expectations. The City has already met its primary goal: gasoline and diesel use are down 10 percent from FY2003. Greenhouse gas and other emissions are decreasing as the City uses less fuel (and substitutes cleaner fuels), and the fleet reductions and efficiency improvements are being implemented (see Appendix). The goal moving forward is to continue reductions in total fuel use and increase the use of green, renewable fuels.

**2007 Green Fleets Team:**

- David Konkle, Public Services - Energy Office
- Tom Gibbons, Public Services - Fleet Services
- Ken Jones, Public Service - Fleet Services
- Jeff Ellis, Community Services - Planning and Development
- Cheryl Saam, Community Services - Parks and Recreation
- Lt. Joe Campbell, Public Safety - Police
- Mark Cozart, Public Services - Utilities
- Tom McMurtrie, Public Services - Solid Waste & Recycling
- Andrew Brix, Public Services - Energy Office Assistant

## APPENDIX – GREEN FLEETS POLICY – FY06 Report

### Air Quality Improvements

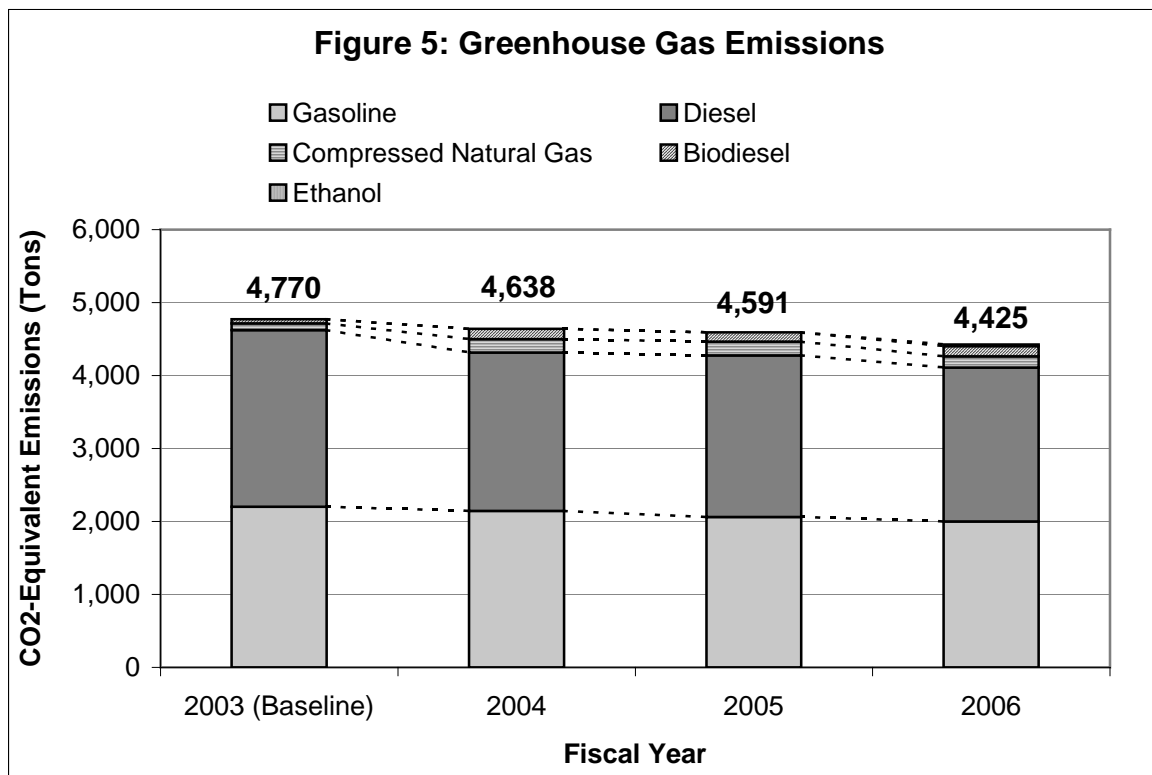
The secondary measure of the City's success in accomplishing the above objectives is the reduction of carbon dioxide (CO<sub>2</sub>) and other emissions

**Reduce emissions of carbon dioxide and other greenhouse gases:** Greenhouse gas emissions from City fleet operations have decreased 7 percent from FY2003 to FY2006. This is due to increased use of biodiesel, natural gas, and a slight reduction in overall fuel use.

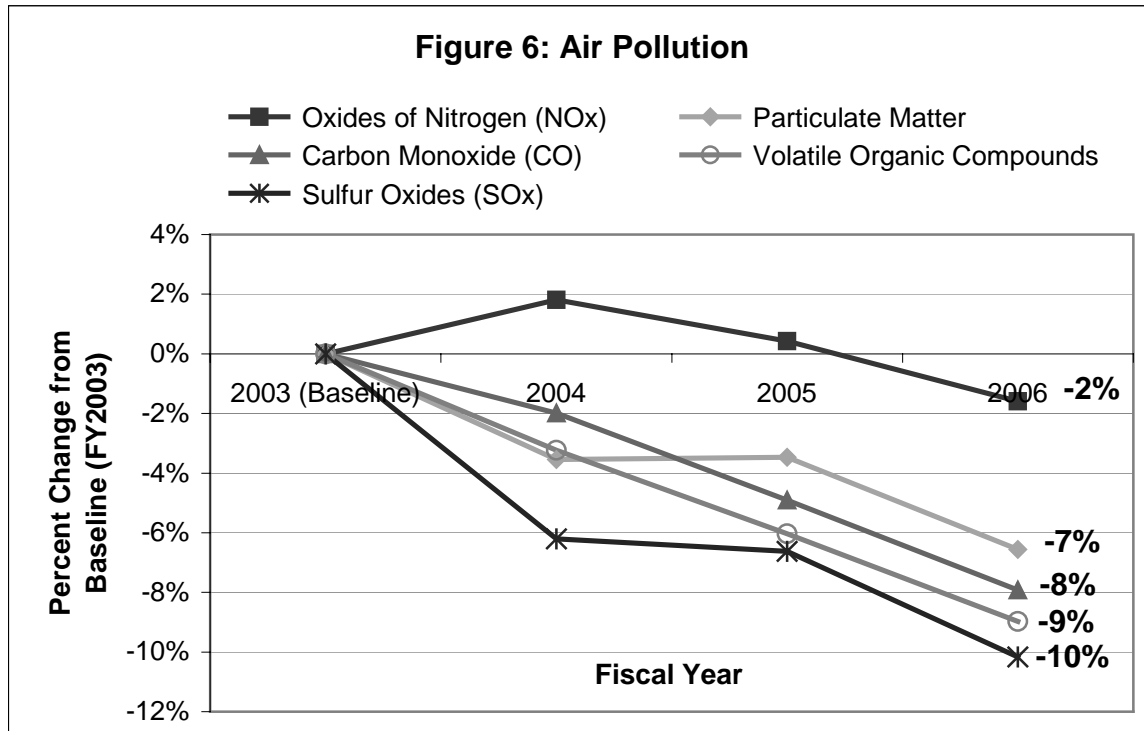
Figure 5 shows greenhouse gas emissions resulting from the City's fuel use. The chart represents all greenhouse gases as equivalent quantities of CO<sub>2</sub> so they can be compared on the same scale. These figures are calculated using lifecycle carbon emissions for each fuel, as shown in Table 1. Greenhouse gas emissions declined from 4,770 tons in the baseline to 4,425 tons in FY2006, a decrease of 7 percent. The City's substitution of biodiesel, ethanol and compressed natural gas for diesel and gasoline, coupled with a slight overall decrease in fuel use, is lowering greenhouse gas emissions.

**Table 1: Lifecycle Greenhouse Gas Emissions for Transportation Fuels**

<u>Fuel</u>	<u>lbs CO<sub>2</sub>e / Gallon</u>
Gasoline	24.1
Diesel	27.8
Biodiesel	7.3
Ethanol	14.6



**Reduce emissions of air pollutants:** The Energy Office estimated emissions for a number of important local and regional air pollutants based on the City’s fuel use (see Figure 6 below). Only NO<sub>x</sub> emissions show a slight increase in FY2004, due to our assumption that biodiesel has slightly higher NO<sub>x</sub> emissions than conventional diesel. (New research suggests this may not be the case, however, so this number may be revised in future reports.) Even with this assumption, however, NO<sub>x</sub> emissions for FY2006 are 2 percent below the baseline, while other emissions are down between 7 and 10 percent.



**CORRECTIONS**

Some of the data and models used in the FY2005 Green Fleets Report have been revised or updated in this report. The most significant revision is to the quantity of diesel fuel used. The FY2005 Report stated that the goal of a 10 percent reduction in gasoline and diesel use had been achieved. Revised data, however, show that FY2005 gas and diesel use were only 7 percent below the baseline (not 10.2% as reported).