This action is a prerequisite for the following actions: driver training, meet target for green fleets, and purchase alternative fuel vehicles

Every municipality manages equipment and vehicles that facilitate provision of services and allow employees to conduct municipal business. The equipment and vehicles make up a fleet that contributes greenhouse gases as well as other pollutants to the environment. These pollutants degrade air, water quality, and public health. A “Green Fleet” minimizes these negative impacts, as well as operating costs, by improving energy efficiency and reducing emissions through the use of alternative vehicles and fuels. Green fleets are developed by purchasing more fuel-efficient vehicles (cars, buses, and service vehicles), converting to cleaner fuels, training drivers to operate vehicles for maximum efficiency, downsizing to smaller vehicles, and reducing municipal use of motor vehicles.

Performing a fleet inventory allows a municipality to evaluate its current vehicles and equipment to better understand where efficiency might be improved. The inventory includes surveying how the vehicle is used, as well as its environmental impact and fuel usage. Once the data has been considered, a strategy for greening the fleet can be developed, including specific efficiency targets.

This Fleet Inventory action will earn 10 points and is a pre-requisite for additional Green Fleets actions. Once the Inventory has been completed, points may be awarded for the following actions:

1) Driver Training - 10 points
2) Purchase Alternative Fuel Vehicles - 10 points

Additional points are available to municipalities that achieve a fleet efficiency target:

- Meet Targets for Green Fleets - 30 points

Note that an additional action is provided for retrofitting diesel vehicles which does not qualify for Sustainable Jersey points but will be useful for municipalities as they meet the requirements of the NJ Diesel Retrofit Law.

Why is it important

Greenhouse gas emissions and pollution from vehicles negatively impact the environment and public health, while inefficiencies in the municipal fleet translate into unnecessary expenses associated with higher energy bills. Improving a fleet's fuel efficiency and reducing overall emissions will result in long-term energy and cost savings, healthier air, and lower greenhouse gas emissions.

Relative to other sectors of the economy, motor vehicle usage accounts for a particularly large share – 20 to 25 percent – of total anthropogenic greenhouse gas (GHG) emissions in the Northeastern United States. Because total vehicle miles traveled are predicted to rise steadily in coming decades, motor vehicles also represent the fastest growing portion of the region’s overall GHG inventory. Transportation has surpassed even industrial activity in the amount of carbon emissions that it generates.

In 2000, 12.3 million passenger vehicles were registered to fleets of ten or more. This is 5.6% of the 221 million vehicles registered in that year. The environmental impact of fleet vehicles is greater than this percentage may suggest, because they are driven more than personal vehicles. For example, the average car was driven 12,000 miles in 2000, while survey data suggests that the average business fleet car was driven close to 23,000 miles. A reasonable estimate is that fleets are responsible for about 10% of passenger vehicle miles driven. Since fleet vehicles account for such a substantial portion of the total vehicle miles driven, it is important to address the efficiency and environmental impact of existing fleets.
Who should lead and be involved with this tool?

Implementing a Green Fleet initiative would typically include representatives from the following municipal departments:

- Task Force or other entity assigned to coordinate Green Fleets (if applicable)
- Any person responsible for municipal and/or departmental vehicle maintenance
- Transportation Department
- Public Works Department
- Purchasing Department or Officer
- Finance Department
- Police Department
- Fire Department

The municipality may choose to designate a fleet maintenance committee that includes personnel from each department already responsible for purchasing, maintaining, and deploying the municipality’s fleet (i.e., police vehicles, fire vehicles, township vehicles, school vehicles, etc). Alternatively, a municipality may choose to make each of these individuals responsible for following the same efficiency standards. In addition, each individual who uses and purchases fuel would have to be informed of the efficiency standards for the municipal fleet.

Timeframe

Depending on the availability of staff and existing records, it could take approximately four to six months to generate a fleet inventory and fuel efficiency audit for the existing fleet.

Project costs and resource needs

Staff can complete the existing fleet inventory and fuel efficiency audit. For each vehicle in the fleet, data must be collected regarding the vehicle type, vehicle year, vehicle mileage, purpose of vehicle usage, frequency of use, fuel type, annual vehicle miles traveled, and annual vehicle fuel purchases.

What to do, and how to do it (“How to”)

Below we have listed the requirements for earning points for this action.

A complete fleet inventory must be completed for the municipality using the spreadsheet provided.

A narrative report must be submitted by the municipality, including a summary of the current fleet composition; maintenance, and driver training practices; an evaluation of current fleet efficiency for the year in which you are applying for certification, and strategies for improvement, and at least one specific target.

We have provided extensive guidance and recommendations for implementing this action. You do not need to follow this guidance exactly as long as your final product meets the requirements.

Complete an inventory of all fleet vehicles, evaluate efficiency, and set goals for improvement.

1) Convene a Task Force or committee consisting of personnel responsible for fleet maintenance, purchasing, and use (see “Who Should Lead and Be Involved with this Action” section).

2) Using the spreadsheet provided, complete an inventory of all existing motorized vehicles owned or operated by all municipal departments and calculate the associated greenhouse gas emissions. See the appendix for details regarding the calculation of carbon emissions attributed to vehicles. The spreadsheet will also assist in calculating methane and nitrous oxide emissions and converting these to carbon dioxide equivalents.

Download the fleet inventory spreadsheet here from the online version of this action at:[here](#).

The spreadsheet requires the identification of a baseline year (the prior calendar year or the most recent twelve month period for which data is available/the year in which you are applying for certification). Reasonable estimates may be provided where exact data is unavailable.
The following inputs are required:

- Vehicle Type (bus, truck, sedan, segway, scooter, etc)
- Vehicle Identification Number (if applicable)
- Year
- Make
- Model
- Fuel Type (Gasoline, Diesel, Propane, etc)
- Odometer Reading at end of Baseline Year
- Miles Traveled in Baseline Year
- Annual Fuel Usage in Baseline Year
- Fuel Units (Gallons, therms, kWh)
- Annual Fuel Cost in Baseline Year
- Average Fuel Efficiency in Baseline Year (miles per fuel unit)
- Is the vehicle owned or leased?
- If leased, in which year will lease contract end?
- If owned, in which year is this vehicle expected to be replaced?
- Municipal Department
- Primary duty of vehicle
- Frequency of Use (daily, weekly, monthly, seasonally, etc)

3) Review vehicle maintenance practices.

Consider the following:

- Maintenance records (i.e. oil check, tire pressure, regular general maintenance).
- Use of recycled oil, anti-freeze, tires, motor, etc.
- Vehicle safety checks.

4) Fleet efficiency audit

Are there opportunities for downsizing? For each vehicle, answer the following two questions in the inventory spreadsheet:

- Could this vehicle duty be replaced by non-motorized transport (bicycle, walking)?
- Could this vehicle duty be performed by a smaller, more efficient vehicle?

Evaluate the inventory data to consider the following:

- Are the current miles per gallon within a similar range for a newer vehicle that is comparable in design? What percentage of fleet vehicles are within these acceptable ranges and what percentage needs to be upgraded, retrofitted, and/or replaced?
- Are the existing vehicle classes appropriate for the duty requirements that the vehicles will be called upon to perform? If not, then what types of vehicles would be better suited for each use?
- If vehicles were switched to alternative fuel sources, by how much would the annual fuel costs be reduced?
- Determine which vehicles in the fleet are good candidates for retrofitting or conversion to alternative fuels. (See Vehicle
• Current greenhouse gas emissions attributed to fleet vehicles. (see Appendix)
• Are vehicles regularly maintained to achieve maximum efficiency and to reduce the occurrences of breakdowns?
• Can improvements be made related to the use of green products for maintenance purposes?

Alternatively, a municipality can hire a professional to conduct an evaluation of the existing fleet and provide recommendations for greening it. For example, the National Renewable Energy Laboratory (NREL) provides a collaborative Fleet Test and Evaluation project through their “Cooperative Research and Development Agreement” in which the municipality would work with NREL at no charge. The municipality can also pay NREL to conduct research without collaboration through their “Work for Others” agreement. (See: http://www.nrel.gov/vehiclesandfuels/fleettest/working_with.html).

5) Identify strategies for fuel efficiency, vehicle purchases, vehicle conversions, driver training and maintenance programs. Set specific targets to transition to a greener fleet.

See the action, “Meet Targets for Green Fleets,” which is an optional follow up to the Fleet Inventory and would earn an additional 30 points. Municipalities may select the targets from this action but are not required to do so to earn points for the fleet inventory.

6) Adopt new policies that reflect the goals set to improve efficiency standards and green the municipal fleet. Policies should also include the following:
• Adopt a no-idling policy (see “Anti-Idling Education & Enforcement Program” action) to further improve efficiency and reduce emissions.
• Use alternative fuels, such as natural gas, ethanol, electricity, and biodiesel, to maximize efficiency and minimize emissions. (See “Vehicle Conversions” and “Retrofit Diesel Vehicles” actions.)
• As new fleet vehicles are needed, purchase flexible fuel and/or hybrid vehicles. (See “Purchase Alternative Fuel Vehicles” action.)
• Drivers should receive ongoing training for the specific types of vehicles and equipment they will be using. (See “Driver Training” action.)
• Eliminate older vehicles that are not retrofitted or those that are not used frequently.
• Ensure appropriate vehicle types and size for maximum efficiency for the duty performed. This includes utilizing alternatives to standard vehicles (e.g., use bicycles or segways for meter maids or police patrols).
• Require regular maintenance on all municipal vehicles to increase fuel efficiency, reduce environmental impacts, and increase the life of the vehicle, (e.g., avoid oil leaks, ensure proper tire inflation).
• Ensure proper use, storage, disposal, and recycling of old parts and hazardous materials.
• Use environmentally responsible materials (e.g. alternative hydraulic fluids, recycled anti-freeze, eco-friendly cleaners, etc.) to maintain fleet.
• Maintain accurate, organized, current records to establish a “baseline” and measure success from actions that are taken to reduce fuel use, costs, and emissions.
• Require that contractors used for municipal projects also implement emission reduction strategies.

7) Implement policies and reevaluate fleet on an annual basis to track progress towards goals.

Fleet inventory documentation should be from within 12 months of the June submission deadline.

What to submit to earn points for this action

In order to earn points, your submission must meet the following standards:

1) A complete fleet inventory must be completed for the municipality, using the spreadsheet provided.

2) A narrative report must be submitted by the municipality, including a summary of the current fleet composition; maintenance,
and driver training practices; an evaluation of current fleet efficiency for the year in which you are applying for certification and strategies for improvement, and at least one specific target.

Submit the following documentation to verify the action was completed to the above standards. (Log in to the password protected webpage where you submit your online application for certification to write in the text box and upload documents).

In the text box, please provide a short narrative (300 word max) to summarize what was accomplished and the general steps taken to accomplish it.

- Upload: Inventory spreadsheet provided with this action as an Excel file. The spreadsheet may be modified or an alternate format may be used as long as all required data is provided.

- Upload: Narrative report including a summary of current fleet composition maintenance, and driver training practices; an evaluation of current fleet efficiency for the year in which you are applying for certification or from within 12 months of the June submission deadline and strategies for improvement, and at least one specific target.

IMPORTANT NOTES: You can upload up to six separate documents for each action. Please excerpt relevant information from large documents. Please remember that your submissions will be viewable by the public as part of your certified report.

Spotlight: What NJ municipalities are doing

EDISON, NJ

The New Jersey State League of Municipalities awarded Edison the “2008 Innovation in Governance Award for Energy Conservation in the 21st Century.” As part of a comprehensive energy audit for the township, Edison made a commitment to converting their municipal fleet to more fuel-efficient hybrid vehicles. Edison is currently operating with 38 hybrid vehicles, including Toyota Prius and Honda Civic Sedans as well as Ford Escape SUVs. The fleet vehicles are utilized for municipal operations, the police department, and the fire department. Officials said the hybrids are being used throughout the township workforce, including the building code enforcement division, the fire department, and the community development block grant program.

A year into their “green fleet” program, Edison acknowledges the resulting benefits of their fleet transition. The transition has not only been good for public relations but has also translated into direct savings. The four hybrids in the police fleet replaced older Ford Crown Victorias that were getting approximately 9-12 miles per gallon (mpg). When calculating the difference in fuel costs annually to account for the Prius Hybrids that get approximately 40-45 mpg and the Ford Escapes that get 31-34 mpg, the city estimates they will save approximately $70,000 in fuel costs annually and lower the overall gasoline budget line by 7%. In addition, the maintenance costs of the new hybrid vehicles are substantially lower than the traditional fleet vehicles have been.

The township saved more than $100,000 on the purchases by applying for rebates through the state Board of Public Utilities and receiving subsidies from Middlesex County, which encourages towns to use hybrids. The new hybrid vehicles have been such a success that the city planned on purchasing at least 26 new hybrid vehicles in 2009.

WESTWOOD, NJ

Westwood, NJ, purchased the first hybrid Ford Escape used for police operations in October 2007 and released data based on the annual fuel consumption and performance of the vehicle. The Borough had been paying $2.40 a gallon for unleaded gasoline and realized an immediate savings of 14 gallons of fuel per 12-hour shift. At $2.40 per gallon, that equals $33.60 per shift, $67.20 per day, $403.20 per week, and $20,996.50 per year. The Borough paid $28,772 for the Ford Escape hybrid, and at $2.98 per gallon, the hybrid will pay for itself in 11.5 months.

WOODBRIDGE, NJ

Woodbridge purchased a dozen Ford Escape hybrids for its Code Enforcement Division after a one-year trial of a single hybrid car proved its cost-effectiveness. The township’s biodiesel fuel program started with a $65,500 grant from the New Jersey Board of Public Utilities (BPU) which helped the township’s Department of Public Works to install an above-ground biodiesel fuel tank and to establish an emissions monitoring program to measure the drop in hydrocarbon emissions from vehicles fueled with biodiesel. The Department of Public Works purchased six municipal vehicles (small trucks and SUVs), two Ford International dump trucks, and two Crane Carrier garbage trucks for the biodiesel pilot program. The township also purchased 12 environmentally-friendly Ford Escape hybrid vehicles to supplement the municipal fleet. The 2007 Ford Escape hybrids cost $25,576 each and are estimated by the manufacturer to get over 36 miles per gallon. The township also reduced the purchase price of the Hybrid vehicles by more than $48,000 through state and county rebates totaling more than $4,000 per vehicle. The Department of Public Works will also receive rebates on the purchase of biodiesel fuel through state and county rebate programs.
Resources

FUNDING RESOURCES

New Jersey's Alternative Fuel Vehicle Rebate Program

http://www.njcleanenergy.com/commercial-industrial/alternative-fuel-vehicle-rebate-program

The U.S. Department of Energy Office of Efficiency and Renewable Energy has a complete database of State & Federal Incentives and Laws related to alternative fuels and vehicles, air quality, fuel efficiency, and other transportation related topics:


Federal summary:


EDUCATION/TRAINING RESOURCES

The British Columbia Green Fleets information management page provides a Fuel Management Systems and Maintenance Management Systems Checklist to help your fleet establish a data baseline.

http://www.e3fleet.com/green_fleets.html

Environmental and Energy Study Institute, Vehicles and Fuels

http://www.eesi.org/vehicles_fuels

US Department of Energy Office of Efficiency & Renewable Energy Alternative Fuels & Advanced Vehicles Data Center

Hybrid vehicles:

http://www.afdc.energy.gov/afdc/vehicles/hybrid_electric.html

Flexible Fuel vehicles:


Natural Gas vehicles:


Propane vehicles:

http://www.afdc.energy.gov/afdc/vehicles/propane.html

Electric vehicles:

http://www.afdc.energy.gov/afdc/vehicles/electric.html

CASE STUDIES

Ann Arbor, MI

Green Fleets Policy


Green Fleets Website (includes annual reports)

http://www.a2gov.org/GOVERNMENT/PUBLICSERVICES/SYSTEMS_PLANNING/ENERGY/Pages/GreenFleets.aspx

Chicago, IL

How the City of Chicago is Reducing Its Fleet Carbon Footprint

Appendix: Calculating greenhouse gas emissions attributed to vehicles

Combustion of transport fuels greatly contributes to CO2 emissions. The municipality must determine a baseline carbon footprint attributed to vehicle use in order to measure ongoing progress toward meeting emission reduction goals. The spreadsheet provided with this action assists in the calculation of a fleet carbon footprint and requires the input of:

1) Total amount of each fuel (gasoline, diesel, B20, CNG, etc) used by the entire municipal fleet in the baseline year.
2) The total vehicle miles traveled (VMT) for each municipal vehicle (aggregated for each vehicle type, see worksheet 3 of the inventory spreadsheet).

Ideally, fuel consumption and mileage is tracked for each municipal vehicle. However, if this data is not available, the following techniques may be used to provide estimates.

Fleet Fuel Consumption:

A municipality must calculate the annual fuel consumption for every type of fuel used (gasoline, diesel, biodiesel, etc.). This number includes bulk purchases and stored fuel as well as any other fuel purchased throughout the year for the fleet. A municipality can use the following equation to determine the annual fuel usage for a given fuel type:

\[
\text{Total annual fuel consumption} = \text{Total annual fuel purchases} + \text{amount stored at beginning of the year} - \text{amount stored at end of the year}
\]

Fuel Consumption per Vehicle:

The municipality can estimate annual fuel consumption from annual vehicle mileage by determining vehicle fuel economies (see [http://www.fueleconomy.gov/efg/findacar.htm](http://www.fueleconomy.gov/efg/findacar.htm)) and using the following formula developed by the U.S. Environmental Protection Agency (EPA):

\[
\text{Total annual fuel consumption per vehicle type (gallons)} = \frac{\text{Total Miles}}{\left(\text{Fuel Economy City mpg} \times 0.55\right) + \text{Fuel}}
\]
The EPA estimates that 45% of mileage is from highway driving, while 55% of accrued mileage is from town or city driving. A municipality may choose to make a different estimate of their fleet’s behavior to more accurately calculate the fuel consumption per vehicle type. The calculations for each vehicle type then must be totaled to measure the fleet’s annual fuel consumption.

**CO2, CH4 and N20 Emissions**

Carbon dioxide emissions are calculated by multiplying the CO2 emission factor associated with each fuel by the total fuel consumption of vehicles using that fuel (calculated above).

Carbon dioxide emissions coefficients for transport fuels are available from the Energy Information Administration:

http://www.eia.doe.gov/oiaf/1605/excel/Fuel%20Emission%20Factors.xls

Methane and nitrous oxide emissions are calculated by multiplying the annual miles driven by each vehicle type by the typical CH4 and NO2 emissions per mile of that vehicle type. The emissions are calculated using data from

http://www.epa.gov/climatechange/emissions/usinventoryreport.html