

Florida

Green

Local

Government

Designation



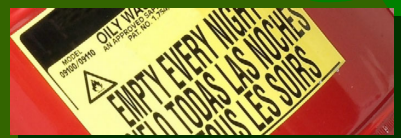
FLEET MANAGEMENT

- & -

VEHICLE MAINTENANCE

Conservation

Planning for our tomorrow...
Working smarter today!



FLEET MANAGEMENT

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ABOUT THE FLORIDA GREEN LOCAL GOVERNMENT DESIGNATION

The Florida Green Local Government Designation is intended to be a standard for evaluating and rating the environmental and sustainability performance of local governments within the state. The overall designation organizes criteria in terms of individual government functions typically centralized within a department. The designation then focuses on improving environmental performance of these functions through a number of techniques and mediums (energy, water, air, land, waste). Primary techniques include recommendations for what the local government can do in-house to **lead by example** within the community, **controls and incentives** that can be enacted to foster green practices within the community, and **education** within the community, including internal staff. In addition to providing a rating system, it is believed that this standard will serve as a valuable resource for enlightening local governments and exposing them to options that they may not have considered before or have not implemented fully.

For more information about the Green Local Government Designation please visit us online at <http://www.floridagreenbuilding.org/> .

OVERVIEW OF THIS DOCUMENT

This module is not intended to provide a detailed explanation of basic job functions. Readers of this document should already be familiar with basic fleet operations and vehicle maintenance procedures. This module is intended to highlight common fleet management operations that often have the potential to demonstrate sustainable practices that go beyond basic compliance. Throughout this module, short descriptions of options are provided for consideration. Along with these short descriptions, the location of additional resources have been provided to allow more detailed research prior to implementing options. In addition, available case studies have been cited to demonstrate “real world” application of techniques.

DISCLAIMER

The information contained in this document is believed to be accurate and reliable and is intended to provide options available for improvement of operations. However, the application of this information is at each local government’s discretion. This module is not intended to be a compliance manual. Fleet managers are advised to work with their local and state environmental regulatory agencies to determine relevant rules and regulations, and how to remain in compliance within their own regions.

Any products or services mentioned in this document are provided only as example references and are not to be considered an endorsement or a comprehensive list of vendors available. Local governments are encouraged to research all available vendors and evaluate their performance based on relevant criteria such as costs, regulatory compliance, reliability, reviews from past customers, etc.

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SECTION I - LEAD BY EXAMPLE

Local governments have an opportunity to *lead by example* and demonstrate the viability and benefits of various environmental practices and technologies within their community. In particular, vehicles are a very visible aspect of operations that are seen daily by the public and are usually widely dispersed geographically. In effect, they are moving advertisements for local government in action.

Fleet vehicles can be found in a variety of shapes and sizes for commuting to and from job sites, as well as performing work tasks at those sites. These can include:

- Traditional sedans, pick-up trucks, and other light duty vehicles
- Police and other law enforcement vehicles
- Ambulances
- Fire and rescue vehicles
- Garbage and recyclable material collection vehicles
- Mass transit vehicles of varying sizes
- Road construction and repair vehicles (earth movers, front-end loaders, back-hoes, dump trucks, etc.)
- Assorted public works vehicles including vacuum trucks, street sweepers, etc.

The acquisition, operation, and maintenance of a fleet can represent a significant expenditure to most local governments. These expenditures represent an opportunity for local governments to demonstrate the importance of environmental protection within their community, as well as realize favorable economic returns at the same time. Even if some or all of the maintenance responsibility for vehicles is outsourced, local governments still have the opportunity, and responsibility, to include environmental criteria within contract specifications.

The following general methodology was used in developing this module and should be applied when reviewing your own specific operations:

1. Minimize the need for product purchases and usage
2. Select environmentally-friendly products
 - a. Efficient (durable, reusable)
 - b. Safer / less toxic (both raw materials and resulting wastes generated)
 - c. Recycled content
3. Collect, segregate and store wastes appropriately
4. Reuse / recycle wastes
5. Evaluate financial performance over the life-cycle

Many of the items identified in this document can fit within the larger “plan-do-check-act” framework of an environmental management system (EMS). An EMS is a set of management processes and procedures that allows an organization to analyze, control and reduce the environmental impact of its activities, products and services, as well as operate with greater efficiency and control. Local governments are encouraged to implement their own EMS.



P2 Success! City of Tallahassee Fleet Management

The city of Tallahassee's Fleet Management Division operates an automotive maintenance and repair facility that services an array of city owned vehicles. The facility has been operating for approximately 25 years and currently services up to 700 vehicles per month.

Over the past eight years, the staff has been involved in the pursuit of pollution prevention and waste reduction initiatives. Michael Corrigan, an Environmental Specialist for the city of Tallahassee, was responsible for many of the positive efforts. He explained, "Innovative products have been purchased, facility processes have changed, and staff training and awareness has increased."

Pollution prevention activities have included:

- Fleet Management has implemented a rigid waste reduction / pollution prevention program. Solvent-based parts washers have been replaced with machines that utilize non-hazardous bio-degradable solutions or detergents. Fleet Management utilizes eight Smart Washers and one Cuda parts washer. Neither machine generates hazardous waste, based on generator knowledge and confirmatory laboratory sampling.*
- Many products, which could be considered hazardous once declared waste, are no longer purchased. For example, Fleet Management forbids the purchase of oil-based paints, paint thinners and mineral spirits.*
- Fleet Management owns and operates an aerosol can puncturing device and liquid containment /propellant filtration system. By operating an aerosol can puncturing device and an associated liquid containment/propellant filtration system, Fleet Management ensures that all waste aerosol cans are completely empty prior to be discarded as solid waste. Although not required by RCRA for aerosol can disposal, the associated carbon filter addresses air quality and emissions standards.*
- Waste coolant / antifreeze is recycled onsite by a mobile recycling service.*
- Used oil, waste batteries, and universal waste lamps are all recycled off-site.*
- Facility generated storm water runoff is directed through onsite oil-water separators prior to being discharged to onsite detention basins.*

Due to the rigid waste reduction / pollution prevention program implemented by Fleet Management, this facility typically generates less than two (2) pounds of hazardous waste per month. The City feels that the benefits of operating a "green shop" are significant. Operating costs have been lowered. Employee safety has increased and the liability associated with handling hazardous waste has decreased.

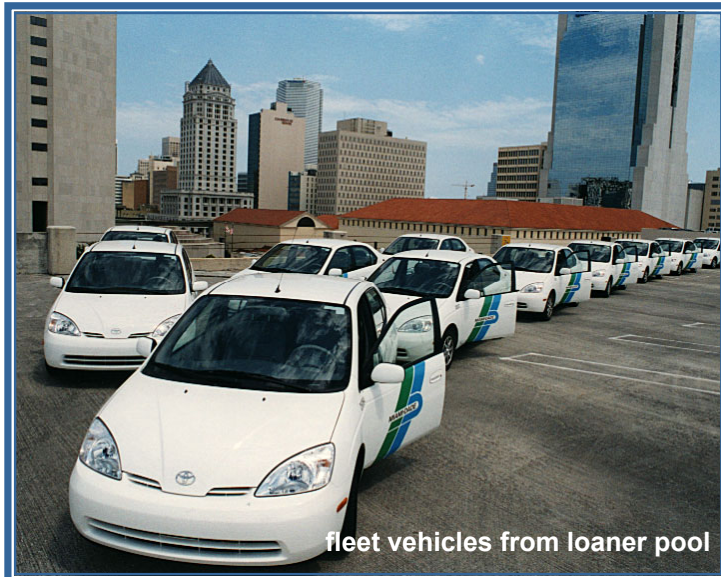
(<http://www.dep.state.fl.us/waste/categories/p2/pages/TallyFleetMgt.htm>)



A. OPTIMIZE VEHICLE USAGE

Each vehicle within a fleet represents an allocation of resources, including raw materials, labor, and finances. Optimal fleet management is a delicate balance of maintaining minimal fleet size, increasing utilization of the available operating time for those vehicles, and ensuring that the needs of internal customers, fellow local government employees, are met.

Fleet managers are able to influence fleet size through a number of direct and indirect methods. A smaller fleet is easier to manage and can also reduce many associated environmental impacts.




1. Reduce vehicle miles traveled

Fleet managers can encourage employees to reduce the number of vehicle miles traveled. Reducing vehicle miles traveled can help to reduce the size of the fleet, the amount of maintenance required, and fuel consumption.

- a. Encourage internal customers to work remotely through the use of telecommuting. This may include working from home, working at satellite offices, or even working more at field sites.

RESOURCES

 US Office of Personnel Management (OPM) and the General Services Administration (GSA) – Interagency Telework Site: <http://www.telework.gov/>

- b. Encourage internal customers to schedule or plan trips so that multiple tasks are incorporated into a single trip. This will reduce trips back to the office. Similarly, where appropriate, vehicles may be placed on 24-hour assignment in order to encourage traveling directly between home and field sites.
- c. Encourage internal customers to reduce vehicle miles traveled by charging them based on mileage and/or fuel usage.

2. Increase vehicle utilization

Fleet managers can encourage internal customers to increase the utilization rates of vehicles. This can help to reduce the size of the fleet that must be purchased and can reduce the number of vehicles requiring time-based maintenance.

- a. Encourage internal customers to utilize vehicles on a pool basis rather than individual assignment when vehicle miles traveled are below certain thresholds. Be careful, as this may encourage customers to “artificially” inflate vehicle miles traveled in order to obtain an assigned vehicle.
- b. Encourage internal customers to utilize vehicles on a pool basis rather than individual assignment by charging a premium for acquisition and maintenance of individual assigned vehicles.



B. PURCHASE EFFICIENT VEHICLES

LEAD BY EXAMPLE

The acquisition of vehicles is an important part of fleet management. Although many municipal procurement systems are restricted by low-bidder requirements, fleet managers have the opportunity to determine the specifications that those bidders must meet. These specifications can be customized to ensure that the best vehicles are purchased not only based upon initial capital costs, but also based upon the operation and maintenance costs that will be incurred over the life of the vehicle. This life-cycle evaluation provides a better method of evaluating the true costs of vehicles.



In addition, local governments have an opportunity to demonstrate environmentally beneficial vehicle technologies to members of the community. These demonstration efforts can help to encourage responsible actions by community members and also help to develop markets, thus driving down prices for environmentally-friendly products.

1. Purchase fuel-efficient vehicles

Fuel-efficient vehicles can help to minimize the costs and environmental impacts from harvesting, processing, distributing, and consuming energy resources.

- a. Vehicle purchasers should ensure that fleet vehicles are among the most fuel-efficient available. At a minimum, vehicles should exceed the relevant CAFE (Corporate Average Fuel Economy) standards. In 2004, this was approximately 27 MPG for passenger cars, and 21 MPG for light trucks. Vehicles with this fuel economy rating or better can be considered to be in the top 50%. Each year the Department of Energy and the Environmental Protection Agency publishes the fuel economy guide. Fleet managers can reference this guide to achieve a more ambitious goal, such as a fleet vehicle fuel efficiency rating in the top 20% or better.
- b. Fleet managers must evaluate the use of the vehicles and the fueling infrastructure to determine which technology will provide the best fuel efficiency while providing satisfactory performance. Using fuel efficiency as a criterion may lead to a variety of solutions including fuel-efficient gasoline or diesel vehicles or hybrid gasoline-electric vehicles. The goal is to constantly re-evaluate available technologies and choose from among the top performers, rather than encourage a specific technology.

RESOURCES

- 🔗 National Highway Traffic Safety Administration: <http://www.nhtsa.dot.gov/cars/rules/cale/>
- 🔗 United States Department of Energy (US DOE), Energy Efficiency and Renewable Energy: <http://www.fueleconomy.gov/>
- 🔗 EPA/DOE Fuel Economy Guide: <http://www.fueleconomy.gov/feg/feg2000.htm>



2. Purchase alternative fuel (renewable energy) vehicles

Vehicles that rely upon alternative fuels (i.e. not traditional gasoline or diesel) can offer environmental and performance benefits, particularly when those sources are renewable. These can include:

- a. Electric: Although not necessarily renewable, power plants are typically more efficient than vehicle engines at consuming other energy sources. Within the vehicle, the conversion from electric to kinetic energy can be very efficient.
- b. Compressed natural gas (CNG): Where low-cost natural gas is available, CNG vehicles can offer a cleaner, more economical alternative to gasoline or diesel. CNG is one of the cleanest of the fossil fuels.
- c. Bio-diesel: this emerging fuel is based upon a percentage (typically 20% up to 100%) of the diesel fuel being derived from “renewable” resources such as waste fats, oils, and greases.
- d. Ethanol: Ethanol can be blended with gasoline to create E85, a blend of 85% ethanol and 15% gasoline. Vehicles that run on E85 are called flexible fuel vehicles. Using ethanol can reduce air pollution. Ethanol is low in reactivity and high in oxygen content, making it an effective tool in reducing ozone pollution.
- e. Hydrogen (combustion): Hydrogen has been used effectively in a number of internal combustion engine vehicles as pure hydrogen mixed with natural gas (HCNG). HCNG vehicles offer the potential for immediate emissions benefits, such as a reduction in nitrogen oxide emissions. HCNG vehicles are an initial step toward the hydrogen-based transportation of the future.
- f. Hydrogen (fuel cells): Through a chemical conversion (not combustion) hydrogen is combined with oxygen. This generates electricity to power an electric automobile, without producing harmful emissions.

RESOURCES

 US DOE, Energy Efficiency and Renewable Energy, Clean Cities Program at <http://www.eere.energy.gov/cleancities/>

3. Purchase vehicles with extended maintenance intervals

Reduced service intervals can help to reduce associated wastes and also increase vehicle utilization rates by reducing the amount of time that vehicles are unavailable while maintenance is performed. When possible, fleet managers should purchase vehicles with extended maintenance intervals. This can include extended oil changes (e.g. bypass filtration systems), extended coolant replacement, extended electrical tune-ups (e.g. platinum spark plugs), etc.



C. SEGREGATE, LABEL, AND STORE FLUIDS PROPERLY

The proper handling of fluids and fluid containing parts is a basic requirement for virtually all vehicle maintenance operations. Fluids used or collected during vehicle maintenance can include:

- New and used oil, coolant, or solvents
- Battery acids
- Hydraulic, transmission, and brake fluids

1. Segregate fluids

Many fluids should not be mixed or stored adjacent to each other. The compatibility of fluids is especially important to understand when the potential for adverse reactions exists, such as between oxidizers and flammables. In addition, materials are easier to manage and more cost effective to recycle when they are segregated.

Waste oil is a good example of a fluid that should be segregated. Waste oil can be handled as a regulated “non-hazardous” waste, as long as there are no hazardous contaminants in it. Typical sources of contamination include solvents, especially chlorinated solvents, from spray cans and other sources. Fluids characterized as “hazardous” wastes are much more expensive to handle than regulated wastes classified as “non-hazardous.”

2. Use proper signs and labels

Properly labeling of storage containers and storage areas is one of the best ways to avoid accidents, warn about potential dangers, and stay in compliance. These labels can be used to identify contents such as “mineral spirits” or provide cautionary advice such as “Flammable – No Smoking.”

Missing or improper labeling is one of the most commonly found compliance violations at facilities. For example, it is important that facilities store used oil in appropriate containers such as DOT approved drums or tanks. Each container must be labeled with the words “Used Oil” and all containers must be maintained in good condition.

Wastes fluids often have a maximum length of time that they may remain at a facility. The inclusion of dates on labels is often required and can serve as a reminder that some wastes must be shipped out by a certain date.

3. Store inside secondary containment

Accidents happen, but engineering controls can be used to help minimize the impacts when they do. Containers may be turned over, drums may be punctured accidentally, tanks may leak, etc. Providing a secondary, or backup, containment system can help to minimize the adverse impacts. Whether they are portable (e.g. spill containment pallets) or they are constructed (e.g. sealed floors and concrete berms), secondary containment should typically be able to hold at least 110% of the volume of the largest vessel stored. Ideally materials will be stored under cover and protected from the rain. If not, a method, such as a spring loaded valve, should be available to drain, collect, and properly handle any rain water that may accumulate within containment areas.



double-walled above ground tanks



4. Seal or berm adjacent floor drains

It is important to first determine if sanitary sewers are available and if so, whether or not the floor drains are connected to them via an oil/water separator. If sanitary sewers are not available, the drains should at least be bermed, or preferably, filled and sealed to prevent discharge of contaminants to them. If floor drains are kept active, they should be connected to a regularly maintained oil/water separator, and then connected to a sanitary sewer system. In this case, emulsifying floor cleaners should not be used as they inhibit the function of the oil/water separator.

5. Use a funnel

A funnel is a very basic tool that can help to minimize spill or drips that occur during fluid transfer operations. It helps to keep adjacent areas clean, including engine parts or the tops of drums. If the funnel does not have a cover, it is important to remove it when done and promptly close the container. When removed, funnels should be allowed to drain and this fluid collected for reuse or disposal.

6. Keep the funnel, lid or bung closed

Keeping funnels, lids, or bungs closed on containers when not in active use is required in many instances, and simply good practice otherwise. This can help to reduce the evaporation of volatile liquids and the associated worker exposure, help to reduce spills, and even help to reduce cross contamination.

7. Inspect for leaks

It is important to leave adequate space around containers in storage areas, in order to facilitate visual inspections. These inspections should be performed on a regular basis so that improper labeling, damage, or leaks may be detected early.

8. Maintain current Material Safety Data Sheets (MSDS)

Material Safety Data Sheets provide a variety of reference information including physical properties and handling procedures for chemicals. Suppliers are required to provide this information to their customers, and facilities should maintain current copies of them as ready reference for employees and emergency responders.

9. Contract reliable haulers and maintain disposal receipts and records

Prior to contracting the service of a waste hauler, it should be confirmed that all state and local licenses, permits, insurance, and financial records are current. Receipts and records must be maintained for a minimum of three (3) years, and should be in an organized format that is easily accessible for review. Some local jurisdictions may require longer retention periods, so it is also advisable to check with the local authorities.

10. Plan and prepare for spills and other emergencies

Prepare in advance for emergencies. Spill containment and handling supplies should be purchased and kept ready. Responsibilities should be assigned to primary and alternate delegates on staff. Provisions should be made for communication with emergency responders as well as environmental agencies (e.g. State Warning Point). Remember to identify the location of and transportation routes to medical facilities.

RESOURCES

- 📞 Florida State Warning Point - Emergencies Only: 1-800-320-0519 or 1-850-413-9911; Non-Emergencies: 1-850-413-9900
- 📞 US EPA - Emergencies <http://www.epa.gov/oswer/emergencies.htm>



D. REDUCE SOLVENTS AND PARTS CLEANING WASTE

Solvents are used for a variety of parts cleaning operations at vehicle maintenance facilities. Unfortunately this also means that solvents are typically one of the top wastes, in volume and toxicity, generated by vehicle maintenance operations. Because of the costs associated with purchasing, as well as disposing of wastes from these chemicals, facilities have a strong incentive to reduce the amount of parts cleaning waste generated.

**1. Reduce the number of parts washers**


One of the best ways to reduce the volume of solvents and parts cleaning waste is to reduce the number of parts washers. Many shops that previously provided a dedicated parts washer for each mechanic have been able to switch to a shared system. The optimal number of parts washers will depend on each operation and the physical layout of maintenance bays, but this is an example of a situation where more is not always better.

2. Switch to more environmentally-friendly solvents

Solvent replacement requires consideration of a variety of factors including safety, substrate compatibility, contaminant, cleanliness requirements, cleaner effectiveness, recycling and disposal options, etc.

- a. Replace any cleaners containing chlorinated solvents. These types of solvents are typically found in carburetor and brake cleaners.
- b. Evaluate alternative solvents including aqueous cleaners, cleaners based on microbial solutions, terpene cleaners, high flash-point hydrocarbon blends, etc.

RESOURCES

 Research Triangle Institute - Solvent Alternatives Guide (SAGE):
<http://clean.rti.org/>

3. Manage inventory of spray cans and other secondary solvent sources

Secondary sources of solvents can include a variety of sprays that are used for specialty applications or convenience when parts can't easily be removed and placed in a parts washer. These secondary sources can become a management burden because hazardous materials documentation, handling, storage, and disposal requirements often apply to these chemicals as well.

- a. Eliminate all secondary sources of solvents if possible.
- b. Reduce the variety of secondary solvent sources by standardizing.
- c. Rotate stock on a first-in first-out (FIFO) basis.
- d. Implement an inventory control and tracking system for distributing secondary solvents sources to staff. For example, allow each mechanic only one spray can a



month, or require that specialty cleaners be checked-out and returned to a central storage at the end of the day, etc.

- e. Use refillable spray bottles. These can be used to apply the primary parts washing solvent at remote sites (e.g. assembled parts that can't be moved to parts washer).
- f. Check staff work areas periodically to ensure that unapproved secondary solvents are not "accidentally" brought in.

4. Implement solvent reduction practices

When cleaning parts, there are practices that can help to reduce the amount of solvent used and waste generated:

- a. Clean only when needed.
- b. Multi-stage parts cleaning:
 - i. Pre-clean with rags or brushes (these rags can then be sent to an approved laundry service)
 - ii. Use a tank with "old" solvent as a pre-soak.
 - iii. Use a tank with "new" solvent for final cleaning. This tank then becomes the presoak tank in step #2 (ii) when it gets too dirty.
- c. Filter and/or distill solvents for reuse.
- d. Adjust schedule for solvent replacement to an "as-needed" basis. Don't be constrained to a monthly service schedule, you may need it less often.

Solvent Distillation Avoids Thousands of Gallons of Waste Solvent

Through the use of on-site distillation units, Miami-Dade County has been able to significantly reduce the volume of hazardous waste that it generates and ships off-site. The distillation units are integrated with the parts washer sinks and allow operators to distill a batch solvent whenever they there is a need. The County purchased 50 of these 30-gallon parts washing sinks to replace the previous units that were serviced each month. The capital expenditure of approximately \$4,000 per unit is recovered by about \$1,800 in service and disposal savings each year. As a result, it is estimated that the County has eliminated close to 18,000 gallons of waste solvent each year and is saving over \$70,000 annually.

5. Store solvents and solvent waste safely

The safe storage of solvents and solvent wastes is required in most jurisdictions and is a good practice to implement even if not required. See Section I.C - "Segregate, Label, and Store Fluids Properly"

6. Wear gloves and other recommended PPE

Personal protective equipment (PPE), such as gloves, are an important requirement to ensure worker safety. Material Safety Data Sheets will provide recommendations for PPE to be used by workers.



E. REDUCE/RECYCLE WASTE OIL AND FILTERS

Waste oil and oil filters are generated by virtually every vehicle maintenance operation. Although waste oil and oil filters are generally considered non-hazardous, they are still regulated wastes in Florida. Therefore, proper handling, recycling, or disposal is required.



1. Reduce the quantity of used oil and used oil filters

- a. Purchase or retrofit vehicles with oil bypass filtration systems. Bypass filters, also known as secondary filters, extend the useful life of lubricating oils by implementing an additional filtration system which removes suspended contaminants missed by the primary filter. Bypass filters are available as standard or optional equipment in some diesel engines, or can be purchased as an aftermarket item. These systems have been shown to significantly extend the interval between oil changes, thus reducing the volume of used oil generated.
- b. Implement an oil quality testing program. Rather than adhering strictly to pre-determined oil change intervals, implement a testing program to determine the appropriate time for oil changes based on your specific driving conditions. This typically results in less frequent oil changes, and is a better method of ensuring that adequate quality is always maintained.

Bypass Filters and Oil Testing Reduce Oil Change Frequency

Miami-Dade County has switched to using bypass oil filters in conjunction with an oil quality testing program for many of its heavy duty vehicles. The previous preventative maintenance schedule called for a mandatory oil change every 90 days costing \$48. Under the new system, only the filter is changed every 90 days, and oil quality testing is done at the same time. The "filter only" change costs approximately \$22. The combination of these two procedures has resulted in oil change periods on various vehicles ranging from the previous 90 days to over two years.

RESOURCES

- 🔗 puraDYN Filter Technologies Inc: <http://www.puradyn.com/>
- 🔗 Gulf Coast Filters Inc: <http://www.gulfcoastfilters.com/>
- 🔗 Oil life extension information @ http://www.epa.gov/region09/cross_pr/p2/autofleet/oil.pdf



2. Select and purchase environmentally-friendly products

- a. Purchase and use re-refined oil. Although most used oil is fuel blended and “recycled” for its energy value, there are instances where the used oil is actually processed into re-refined oil. As with all recycling, this market is only viable if consumers purchase this re-processed oil.
- b. Purchase reusable oil filters.

Re-refined Oil Demonstrates Environmentally Preferable Purchasing

In Portland, Oregon, the transit agency, TriMet, is using re-refined oil in its entire fleet of 670 busses. Over a year of testing showed performance comparable to virgin materials. As a result, they have switched the approximately 55,000 gallons of lubricating oil they purchase yearly.

(From American Recycler, “Portland, Oregon Transit Bus Fleet Uses Re-refined Oil” <http://www.americanrecycler.com/12portland02.html>.)

RESOURCES

- 🔗 Office of the Federal Environmental Executive:
<http://www.ofee.gov/recycled/refined.htm>
- 🔗 California Department of Toxic Substances Control (DTSC):
<http://www.dtsc.ca.gov/PollutionPrevention/re-refined-oil-fact-sheet.pdf>
- 🔗 Oregon Natural Step Network: “TRIMet” <http://www.ortns.org/resources.asp>
- 🔗 Reusable oil filters information @
http://www.epa.gov/region09/cross_pr/p2/autofleet/reusable.pdf

3. Safely collect, segregate, and store used oil and used oil filters

- a. Thoroughly drain all fluids from oil filters prior to disposal. Oil filters can then be crushed and sold to an approved metal recycler.
- b. During removal or disassembly of other scrap parts, thoroughly drain, capture, and store all oil and other fluids prior to recycling.
- c. The safe storage of oil and oily wastes is required in most jurisdictions and is a good practice to implement even if not required. See Section I.C - “Segregate, Label, and Store Fluids Properly”.

RESOURCES

- 🔗 Florida DEP, Waste Management:
http://www.dep.state.fl.us/waste/categories/used_oil/

4. Recycle used oil and used oil filters

Recycle used oil and used oil filters with an approved recycler. Recyclers will often pay \$.10 - \$.20 per gallon for used oil.

Organize and maintain recycling receipts on-site for at least 3 years so you can demonstrate proper handling.



F. BATTERIES

Batteries are a common waste generated by fleet operations. They typically contain a combination of toxic heavy metals (e.g. lead, cadmium, lithium) and acids. Batteries have always been a standard component of vehicle design. However, as hybrid, electric, and fuel-cell vehicles become more common, there will be a corresponding increase in the need for proper management of batteries. If managed properly, batteries can be handled in a manner that is safe for the environment and that adds little or no cost to the facility.



1. Rotate battery stock on a First-In First-Out (FIFO) basis

Batteries are typically constrained by a limited shelf-life, so older stock should be used first.

2. Extend battery life

In some instances there are a few actions that can be taken to extend the useful life of batteries.

- a. Maintain charge on inactive vehicles by connecting batteries to a trickle charge system during extended vehicle down time.
- b. Extend battery life by utilizing brass connectors which can significantly improve conductivity and reduce sulfation of the lead plates.

3. Collect, segregate, and store batteries safely

The storage and handling of batteries and battery fluids is an important requirement for facilities; including acids that may be used for refilling.

New and used batteries should be stored upright, off the ground, and over an impermeable and dry surface. This surface should be able to contain any liquids that may leak from the batteries. See *Section I.C - "Segregate, Label, and Store Fluids Properly"*.

4. Recycle batteries

Battery cores are a valuable resource. Battery suppliers are able to reclaim materials from the cores for reuse.

- a. Used batteries should be returned to a supplier or reclaimer. Suppliers will often provide a credit for battery cores.
- b. Organize and maintain recycling receipts on-site for at least 3 years so you can demonstrate proper handling.

RESOURCES:

 Association of Battery Recyclers @ (813) 626-6151



G. RADIATORS AND COOLANT/ANTIFREEZE

Radiators are heat transfer units used in engines to ensure the proper regulation of engine temperatures. These units are filled with coolant or antifreeze and these fluids need to be replaced periodically. This generates a regulated waste stream that facilities must handle properly.

Extensive radiator repairs involving soldering and boil-out tanks can generate caustic waste solutions, as well as wastewater contaminated with zinc and lead.



1. Outsource to a specialist

If it is not necessary to perform this work everyday, then it may be a better option to outsource to a specialist that will maintain the proper equipment and perform the job as efficiently as possible.

2. Decrease need for coolant/antifreeze replenishment and replacement

- Purchase extended life antifreeze.
- Identify and repair radiator leaks quickly.

3. Select environmentally-friendly products

- Consider replacement of ethylene glycol antifreeze with safer alternatives such as propylene glycol coolants.
- Purchase or use recycled antifreeze.

4. Collect, segregate and store coolant safely

The proper collection and storage of coolant/antifreeze is a requirement in most locations. In addition to being more toxic than propylene glycol, ethylene glycol has been reported to have a “sweet” smell or taste that may attract animals to drink it. See *Section I.C - “Segregate, Label, and Store Fluids Properly”* for more information.

5. Recycle coolant/antifreeze

Implement one of the three options below for antifreeze recycling programs. The best option will usually depend on the volume of antifreeze that is generated. (Tip: maintain records as required. This may also help determine the best option.)

- On-site recycling: Waste antifreeze is collected and recycled on-site utilizing specialized filtration or distillation equipments.
- Mobile recycling: The facility may contract the service of a mobile recycling company to periodically recycle and process waste antifreeze for reuse.
- Off-site recycling: Waste antifreeze is collected and transported off-site.

RESOURCES

US EPA- OSWER -MSW Commodities : <http://www.epa.gov/epaoswer/non-hw/muncpl/antifree.htm>



H. WHEELS AND TIRES


The replacement of worn tires is a regular maintenance procedure that can quickly become a significant periodic expenditure. Tires can have a variety of environmental impacts over their life, so proper management is an important component of a good vehicle maintenance operation.



1. Reduce tire tread wear

- Purchase tires that are longer wearing and designed for expected driving conditions and requirements. For example, while law enforcement and some emergency responders may require high-speed performance rated tires, the same requirement should not be applied to all vehicles. Choose the tire that best matches the expected driving conditions and requirements and has a long tread life.
- Regularly check and maintain proper inflation pressure.
- Rotate and balance wheels on a regular schedule.
- Align wheels on a regular schedule.

RESOURCES

 Tire Industry Association: <http://www.tireindustry.org/>

2. Retread / Recap tires


Retreading, or recapping, is the process whereby inspected and selected worn tires, called casings, receive a new tread. The worn tread is buffed away, and a new tread is bonded to the tire body in a process very similar to the manufacture of a new tire. This recycling/reuse practice can save fleet operations as much as 50% off the cost of purchasing new tires, as well as saving on disposal cost of used tires. Properly selected and retread tires have proven to be as efficient and safe as a new tires. Inspect and select suitable tires for retreading up to three times.

Miami-Dade County Saves By Retreading Tires

Miami-Dade County retreads heavy-duty tires for use up to 3 times before final disposition. Worn tires are thoroughly inspected to ensure suitability to be retread. In 2003 the Miami-Dade County saved over \$1,000,000 by retreading over 7,000 tires.

RESOURCES

 Tire Retread Information Bureau: <http://www.retread.org/>

 Waste Reduction Resource Center -Tire retread facts:
<http://www.p2pays.org/ref/11/10504/html/usa/retread.htm>



3. Reuse / Recycle wheel balancing weights

Wheel balancing weights are typically made from lead. These weights should be reused if possible, or otherwise collected and sent to a lead recycler for reclamation.

4. Collect and store tires properly

Tire storage can present a set of competing concerns for facilities. Fire departments are often concerned about them as a combustible material source and would prefer them stored away from everything else. If stored outside, the collection of rain water in them can provide a terrific breeding ground for mosquitoes.

- a. Prevent the entrapment of water in tires by keeping them undercover and/or indoors.
- b. Evaluate and minimize fire hazards associated with indoor tire storage.
- c. Do not accumulate an excessive number of waste tires. The storage of excessive quantities of tires (> 1000) can actually require a landfill or a recycler permit.

RESOURCES

 Florida Department of Environmental Protection:
<http://www.dep.state.fl.us/waste/categories/tires/>



I. VEHICLE WASHING

The number of vehicles washed by a typical fleet operation can cause significant environmental concerns. Water from vehicle washing is process wastewater and should never be allowed to enter into storm drains or septic drain fields. This is especially true of wastewater generated from engine washing.



1. Contain and collect vehicle washwater

Vehicle wash racks should be set-up with containment and collection systems for wastewater, such as berms and drain sumps.

2. Use the minimal volume of water possible

- Install a high-pressure low-volume (HPLV) washing system. These systems generally utilize less water and eliminate or minimize the need for detergents.
- Install spring-loaded nozzles on hoses used for washing. This is more convenient for operators than requiring them to frequently turn on and off the water source. It also reduces water waste due to “accidentally” leaving the hose running.

3. Use the minimal cleaning agent practical

- If water alone will work, then use only water. This also applies to engine degreasing that can often be performed with only steam.
- If a cleaning agent must be used, choose one that contains only surfactants or weak emulsifiers. Surfactants will help to lift soils from the surface without “binding” them in solution. NOTE: Emulsifiers will suspend oils in solution and thus make equipment such as oil skimmers or oil/water separators ineffective.
- Avoid using degreasing agents with hydrocarbon solvents, especially chlorinated solvents.

4. Treat and recycle vehicle washwater

Vehicle washwater can often be treated and recycled for reuse. When non-emulsifying cleaning agents are used, this is also a suitable practice for floor washwater. Treatment such as oil skimming, settling, and filtration, can clean this water so it is suitable for reuse. This can facilitate a closed-loop system, which generally only requires the periodic addition of make-up water.

RESOURCES

- US EPA - Federal Facilities Compliance Assistance - Vehicle Maintenance Facility Tour - Vehicle Washing:
<http://www.epa.gov/fedsite/vmf/p2vehwash.html>



J. BODY REPAIR AND PAINTING

Body repair and painting, such as collision repair, is a specialized operation that is generally required on an irregular basis. As such, it is often a good candidate to be outsourced by fleet managers. The following information can be applied if these operations are performed in-house and can be used to encourage environmental specifications in contracts and vendor selection when the operation is outsourced.



RESOURCES

 Pollution Prevention Resource Exchange (P2Rx) – Auto Body Sector Hub:
<http://www.p2rx.org/>

1. Outsource to a specialist

If it is not necessary to perform this work everyday, then it may be a better option to outsource to a specialist that will maintain the proper equipment and perform the job as efficiently as possible.

2. Use high transfer efficiency paint equipment

The term “transfer efficiency” is used to describe how much of the paint that is sprayed actually ends up coating a surface. Traditional paint guns that atomize paints at high air pressures can often result in excessive overspray, resulting in transfer efficiencies of less than 25%. High volume, low pressure (HVLP) paint guns have evolved over the years since their introduction to become the standard preferred paint application method in all but the most cosmetically critical scenarios of vehicle refinishing. With the proper staff training and operation, the standard HVLP gun can achieve a transfer efficiency of over 50%. In the majority of instances, the resulting finishes are well within the requirements of local government fleets.

- a. Maintain and use painting equipment per manufacturer recommendations.
- b. Adequately train operators that may be switching to HVLP guns for the first time.

3. Properly install, use, and maintain paint spray booths

All spray painting, including priming, should be performed within a spray booth. Spray booths help to ensure a “dust-free” surrounding and serve to capture any overspray particles that result. If not captured, this overspray is often a nuisance that can mar the surfaces on nearby equipment, as well as the surfaces of vehicles in the parking lot.

- a. Implement a dry cleanup method (i.e. sweeping or vacuum) at the beginning and end of each spray booth operation.
- b. Check and replace spray booth filters whenever they become loaded or clogged.
- c. Use baffle type or graduated filters to reduce the frequency of booth filter changes.

4. Reduce volume of paints purchased

- a. Properly manage inventory, using first-in first out (FIFO) procedures.



- b. Purchase and mix only the quantity of paint needed for the current jobs.
- c. Where practical, remix left-over paint for use in undercoats.

5. Reduce painting solvents

- a. Schedule color changes and other painting operations to minimize the need for cleaning equipment (e.g. progressing from light to dark paint).
- b. Utilize closed and recirculating gun washers.
- c. Solvents used for cleaning should only be sprayed into a collection container. They should never be sprayed into booth filters.

6. Collect, segregate, and store paint solvents safely

Solvents are used in painting operations primarily to clean guns, cups, and/or lines. These solvents should be properly managed. *See Section I.C - "Segregate, Label, and Store Fluids Properly" for more information.*

7. Recycle paint solvents

Paint solvents can be distilled on-site for reuse, or shipped off-site for recycling.

- a. Batch distillation units can be purchased to distill solvents on-site. Determine if these units are cost effective by examining the volumes regularly used and comparing the price for fresh solvent to the price of shipping used solvent off site.
- b. Maintain recycling receipts on-site to demonstrate proper handling.



K. FUELING STATIONS

The operation and maintenance of fuel storage facilities and dispensing units are often a part of fleet management responsibilities. The large volumes of fuel typically stored, along with the potential for a leak or spill, require that fleet managers pay close attention to proper storage, handling, and leak detection procedures.



fleet fueling station

RESOURCES

- 🔗 Florida Department of Environmental Protection : <http://www.dep.state.fl.us/waste/categories/tanks/>

1. Evaluate outsourcing to a fueling service

It may be economical to have an outside company refuel vehicles each night. This allows an outside vendor to specialize in storage and handling of fuels and reduces the burden on fleet managers.

2. Explore gasoline vapor recovery opportunities

In addition to evaporative emissions at the fueling point (nozzle to car), which are addressed by the traditional Stage II Vapor Recovery programs, gasoline product is lost through evaporative emissions at the dispenser's vent stack. Several companies offer a "membrane" system to prevent evaporative emissions of gasoline vapor from underground storage tanks. The membrane, which is hydrocarbon selective, separates air from gasoline vapor. The gasoline vapor is redirected to the storage tank while the air is released through the vent stack of the dispensing unit. The membrane systems are designed to reduce evaporative emissions of hydrocarbon vapors by over 95%, while increasing the amount of saleable product by an estimated 0.30% of gasoline throughput. The membrane system may be used either with or without Stage II Vapor Recovery Systems. The following resources provide illustrations of the process flow, technical summaries, environmental and economic benefits, information on equipment interaction issues, and frequently asked questions.

RESOURCES

- 🔗 The Permeator - Arid Technologies: <http://www.aridtech.com/>
- 🔗 The Vaporsaver – OPW : http://www.opw-fc.com/product_detail.aspx?pid=10

3. Track fuel usage

Keeping records of vehicle fuel usage is an important part of fleet management.

- a. Integrate fuel usage with a preventative maintenance program so that poor performing vehicles are identified for maintenance or replacement.
- b. Use fuel consumption records to verify fuel efficiency.



4. **Records reconciliation and leak detection systems**

The early identification of leaks and quick repairs can help to minimize adverse environmental impacts and the associated expenses for site clean-up and remediation.

- a. Maintain records of fuel delivered and pumped, and compare this information to a physical inventory. Differences may indicate a leak and should therefore be resolved as quickly as possible.
- b. Periodically check dispenser hoses, piping, valves, and tanks for leaks. Monitoring wells and electronic leak detection systems can also be used.

5. **Avoid “topping-off” tanks**

Topping-off tanks when refueling vehicles can often lead to minor spills and can also lower the performance of vapor recovery systems. Signs should be posted and drivers instructed not to top-off when refueling.

6. **Secondary containment for tanks and piping**

Secondary containment should be installed where practical. Secondary containment for tanks may include double-walled vessels or vaults for underground tanks and/or bermed or similarly constructed areas for above ground tanks. *See Section I.C - “Segregate, Label, and Store Fluids Properly” for more information.*

7. **Consider switching to above ground tanks**

Facilities should consider switching to above ground tanks (AGT). AGTs allow for visual inspection of tank integrity and identification of leaks. However, AGTs require more floor space than underground tanks and can be subject to above ground hazards such as impact accidents.

8. **Prepare for emergencies**

Prepare in advance for emergencies.

- a. Provide a clearly labeled and easily accessible emergency shut-off valve.
- b. Spill containment and handling supplies should be purchased and kept ready.
- c. Responsibilities should be assigned to primary and alternate delegates on staff.
- d. Provisions should be made for communication with emergency responders as well as environmental agencies (e.g. State Warning Point).
- e. Remember to identify the location of and transportation routes to medical facilities.

RESOURCES

- 🔗 Florida State Warning Point - Emergencies Only: 1-800-320-0519 or 1-850-413-9911; Non-Emergencies: 1-850-413-9900
- 🔗 US EPA - Emergencies <http://www.epa.gov/oswer/emergencies.htm>
- 🔗 EPA, Preventing leaks and spills at service stations, a guide for facilities: <http://www.epa.gov/region09/waste/ust/servicebooklet.pdf>



L. GENERAL HOUSEKEEPING BEST MANAGEMENT PRACTICES

Although not a specific function, one of the most important aspects of implementing an environmentally “green” fleet operation is proper attention to good housekeeping practices. These practices can help to avoid many unwanted environmental impacts such as releases to open ground, storm drains, or even adjacent water-bodies. Apart from being illegal in most instances, these releases are often much more expensive to clean up.



RESOURCES

🔗 US EPA - Automotive Parts: <http://www.epa.gov/epaoswer/non-hw/muncpl/auto.htm>

1. Immediately contain and clean-up leaks and spills

Leaks and spills can make for a messy operation that can lead to accidents and environmental contamination.

- a. Train drivers/operators to visually inspect their vehicles for leaks.
- b. Vehicles waiting in a parking lot for repairs are frequently a source of leaks. These vehicles should be parked under cover, if possible, and in a location where leaks can be contained and not contaminate rainwater. Drip pans can be placed to capture fluids and these fluids should be collected as soon as possible.
- c. Minor spills should be cleaned up immediately. Any absorbent material used should be picked up from the floor as soon as possible. Absorbent material left on the floor is an opportunity to increase the contaminated area and an invitation for future accidents. Examples of clean-up equipment and absorbent materials may include:
 - “Liquid” vacuums including specialized pneumatic/hydrocarbon vacuums
 - Reusable pads: These may be hydrophobic (water-repelling) and oleophilic (oil attracting). In many instances they can be “squeezed” and reused.
 - Shop towels: These can then be laundered by an approved service for reuse.
 - Peet moss: Generally reported to absorb much greater volume than standard “spill dry” and to have a higher heating value when “recycled” through fuel blending.
 - “Spill dry,” “shop sand,” “kitty litter.”

2. Perform all mechanical service within the service bays

It may be tempting to perform “minor” work outside of service bays in areas such as the parking lot, but this should be avoided. In many cases this “minor” work leads to spills



that eventually contaminate rainwater, which then drains to nearby storm drains or open ground.

- a. Perform all work within a controlled service area.
- b. Coat shop floors with a chemical-resistant epoxy sealant to prevent oil/solvent spills from seeping through the floor and into ground water.
- c. Seal and abandon floor drains to prevent spills of regulated fluids from entering them and being discharged. If sealing is not an option, install a berm around the drains, at a minimum.

3. **Protect storm drains from potential contamination**

Protect storm drains from potential contamination by implementing precautionary measures such as berms, storm drain filters, and periodic cleaning to remove potential contaminants.

Storm drain filters can be considered a last line of defense after other procedures and controls have been implemented. They can help trap contaminants entering a storm but must be maintained on a regular basis to be effective.

4. **Keep shop clean and organized**

Keeping the shop clean and organized is one of the easiest and simplest first steps in maintaining an accident and violation-free operation. An organized and clean shop is a sign of a well-managed shop.

- a. Regularly dry sweep shop floors to prevent unnecessary buildup of dirt and contaminants.
- b. Designate cleaning equipment for specific spills/cleaning requirements. For example, designate specific mops and buckets as “general floor cleaning only,” or “coolant only,” or “oily water only,” etc.
- c. Hold technicians responsible for clean workstations.

5. **Properly store and recycle/dispose of scrap parts**

Scrap parts can vary widely in size and composition and must be handled properly to avoid storage, contamination, or disposal problems.

- a. Automotive parts containing fluids should be stored over an impervious surface and under a roofed area.
- b. Scrap metal parts (e.g. brake rotors, mufflers, wheel weights, battery cable terminals, etc.) should be segregated according to composition (e.g. lead, aluminum, iron), and recycled accordingly.
- c. Collect metal filings/shavings from machining operations for recycling.
- d. Core parts (e.g. alternators, master brake cylinders, starters, etc.) should be returned to a parts supplier for rebuilding/refurbishing.
- e. Scrap catalytic converters contain platinum, a valuable and recyclable metal. Separately store waste catalytic converters from other scrap metals, and recycle this item through a catalytic converter collection center.

6. **Properly handle parts that may contain mercury**

Various mechanisms on vehicles may contain mercury which is regulated as a hazardous waste. These mechanisms may include:

- HID headlamps
- ABS sensors and switches



- Video and navigational display units
- Backlit instruments
- A variety of switches for the hood, trunk, or door lights

Mercury containing parts must be properly handled and disposed of in order to prevent mercury releases into the environment.

RESOURCES

- 🔗 The EPA Mercury Switch and Auto Recycling Program: <http://www.epa.gov/epaoswer/hazwaste/mercury/ntl-switch.htm>
- 🔗 CCAR Greenlink- Vehicle Mercury Component List : <http://www.ccar-greenlink.org/links/mercury.htm>

7. Properly handle airbags that contain toxic chemicals

Air bags contain regulated chemicals. A chemical of particular concern is Sodium Azide, which is the gas used to deploy the airbag. Because this gas is highly reactive, the management and disposal of unused airbags must be considered with regard to hazardous waste and other environmental regulations, as well as personal safety.

RESOURCES

- 🔗 The Automotive Occupant Restraints Council (Includes a listing of recycling and disposal services): <http://aorc.org/abird/>

8. Properly recycle/dispose of fluorescent lamps

A waste that is often overlooked in fleet maintenance operations is fluorescent lamps. These energy saving lights can help to save on electricity costs and actually have a net environmental benefit. However, they must be handled properly, sometimes as a regulated waste, depending on their mercury content. Preferably, these lamps should be collected and shipped to a recycler that can handle these mercury containing devices.

RESOURCES

- 🔗 Florida Department of Environmental Protection: <http://www.dep.state.fl.us/waste/categories/mercury/>



M. REFRIGERANT RECOVERY

Chlorofluorocarbons (CFCs) are chemicals commonly used as refrigerants. Unfortunately, many CFCs have been found to have a high ozone depletion potential that can weaken the protective ozone layer located in the Earth's stratosphere.

Most activities associated with refrigerants are highly regulated. These regulations range from a complete ban on the manufacture of some chemicals, to stringent requirements for equipment and operator training when working with these and other related chemicals. Facilities that perform A/C repair involving these ozone-depleting chemicals must have equipment to recapture and/or recycle the refrigerant.



1. Diagnose and repair leaks quickly

Check for and repair leaks prior to recharging air-conditioning systems.

2. Use approved capture and recycling equipment

All refrigerant should be captured from air conditioning equipment when performing maintenance work. This captured refrigerant can then be recycled on-site or off-site for reuse.

- a. Equipment must be EPA or UL listed and approved.
- b. Equipment must be able to recover at least 80%-90% of refrigerant.
- c. Refrigerant storage containers must be DOT or UL approved and properly labeled.

3. Train technicians

Technicians that perform air-conditioning services must be properly trained and certified as per EPA Section 609 of the Clean Air Act.

RESOURCES

 Florida Department of Environmental Protection:
<http://www.dep.state.fl.us/air/pollutants/cfc.htm>



SECTION II - CONTROLS AND INCENTIVES

There are few Controls and Incentives that apply specifically to fleet management and vehicle maintenance without falling within a larger framework of environmental protection or transportation management. The following items provide some examples that may be adapted to fit a specific local government. These actions are often not within the purview of a fleet manager, however they often will impact fleet management operations.

In addition to external controls and incentives, fleet managers have the opportunity to institute internal controls and incentives. These can include regular audits of work areas, the inclusion of environmental criteria on performance evaluations, and the use of employee suggestion programs to encourage staff to think green.



A. NATIONAL FLEET PERFORMANCE PROGRAMS

Although local governments do not have the ability to implement national standards, these standards are important because they may affect the operation of fleets within a local government's jurisdiction. They may also serve as a template for the local government to implement their own controls or incentives programs. Whether originating from federal, state, or local governments, it is very important for fleet managers to keep track of legislative and regulatory developments that can affect the operations of their fleets. Two organizations that track such changes are the National Association of Fleet Administrators (NAFA) and the Edison Electric Institute (EEI).

RESOURCES

- 🔗 National Association of Fleet Administrators (NAFA): <http://www.nafa.org/>
- 🔗 The Edison Electric Institute (EEI) at <http://www.eei.org/>

1. Corporate Average Fuel Economy (CAFE) standards

An example of national vehicle regulations is the Corporate Average Fuel Economy (CAFE) standard. Congress first enacted the CAFE standard in 1975 with the purpose of reducing energy consumption by increasing the fuel efficiency of cars and light trucks. Regulating CAFE is the responsibility of two federal agencies: The National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA). Fleet managers should closely follow any changes in CAFE standards.

CAFE is defined by the NHTSA as, "The sales weighted average fuel economy, expressed in miles per gallon (mpg), of a manufacturer's fleet of passenger cars or light trucks with a gross vehicle weight rating (GVWR) of 8,500 lbs. or less, manufactured for sale in the United States, for any given model year." Fuel economy is defined as the average mileage traveled by an automobile per gallon of gasoline (or equivalent amount of other fuel) consumed, as measured in accordance with the testing and evaluation protocol set forth by the Environmental Protection Agency (EPA).

Current CAFE standards are:

- For Model Year (MY) 1990, the passenger car standard was increased to 27.5 mpg, and currently remains at this level.
- On March 31, 2003, NHTSA issued new light truck standards, setting a standard of 21.0 mpg for MY 2005, 21.6 mpg for MY 2006, and 22.2 mpg for MY 2007.

The CAFE law provides for special treatment of vehicle fuel economy calculations for dedicated alternative fuel vehicles and dual-fuel vehicles. The fuel economy of a dedicated alternative fuel vehicle is determined by dividing its fuel economy in equivalent miles per gallon of gasoline or diesel fuel by 0.15. Thus for a 15 mpg dedicated alternative fuel vehicle the rating would be calculated as follows:

$$\text{Fuel_economy} = \frac{\text{equivalent_fuel_economy(mpg)}}{0.15} = \frac{15 \text{ mpg}}{0.15} = 100 \text{ mpg}$$



2. Energy Policy Act

The intent of the Energy Policy Act (EPAc) of 1992 is to reduce reliance on petroleum products. It is a federal law that requires fleets of more than 20 centrally fueled, light-duty vehicles located in metropolitan areas, to purchase alternative fueled vehicles (AFVs). AFV replacement requirements are as follows:

- a. State and Alternative Fuel Provider: Under this rule of EPAc, state government and alternative fuel provider fleets must obtain alternative fuel vehicles (AFVs) if they operate, lease, or control 50 or more light-duty vehicles (LDVs) within the United States. Of those 50 vehicles, at least 20 must be used primarily within a single Metropolitan Statistical Area (MSA)/Consolidated Metropolitan Statistical Area (CMSA).
- b. Federal Fleet Rule: In fiscal year (FY) 2000 and beyond, 75% of light-duty vehicle (LDV) acquisitions of qualifying federal agency fleets must be AFVs. Signed in April 2000, Executive Order (E.O.) 13149, "Greening the Government through Federal Fleet and Transportation Efficiency", directs federal agencies to fulfill the intent of EPAc to reduce reliance on petroleum products.
- c. Private and Local governments Fleet: Section 507(e), (42 U.S.C. 13257(e)), of the Energy Policy Act (EPAc) instructs the U.S. Department of Energy (DOE) to determine whether private and local government fleets should be required to acquire alternative fuel vehicles (AFVs). On January 29, 2004, DOE published a final rule announcing its decision not to implement an AFV acquisition mandate for private and local government fleets.
- d. Alternative Fuel Designation Authority: Section 301(2) of EPAc defines alternative fuels and sets forth authority for the U.S. Department of Energy (DOE) to add more alternative fuels to the list of authorized alternative fuels, which are defined in Section 301(2). DOE is authorized to add fuels to this list only if the following three criteria are met: (1) The fuel is substantially non-petroleum, (2) The fuel yields substantial energy security benefits, and (3) The fuel offers substantial environmental benefits.

RESOURCES

- 🔗 National Highway Traffic Safety Administration (NHTSA):
<http://www.nhtsa.dot.gov/cars/rules/cafe/overview.htm>
- 🔗 US DOE. EERE, Energy Policy Act:
<http://www.eere.energy.gov/vehiclesandfuels/epact/>



B. LOCAL FLEET PERFORMANCE PROGRAMS

Similar to National Fleet Performance Programs (*see Section II A*), local governments have the opportunity to impose local standards upon select fleets within their jurisdiction. One of the best places to start is setting an example internally. For example, Miami-Dade County enacted an ordinance directing an increase in fleet fuel efficiency to reduce dependence on foreign oil supplies and decrease air pollution. Excerpts from this ordinance are provided below:

Miami-Dade County Ordinance R-969-03

TITLE

RESOLUTION DIRECTING COUNTY MANAGER TO DEVELOP AND IMPLEMENT A PLAN FOR REDUCTION IN THE COUNTY'S CONSUMPTION OF GASOLINE AND TO TAKE CERTAIN ACTIONS TO INCREASE FUEL EFFICIENCY OF THE COUNTY'S VEHICLE FLEET

BODY

WHEREAS, petroleum products essential to the County's daily operations are increasingly becoming more expensive and the County's costs for those sources of energy are likely to exceed historic levels for the foreseeable future, and

WHEREAS, dependence on foreign oil supplies from the OPEC nations is a reducible threat to the long-term security of this community and this nation; and

WHEREAS, the Board of County Commissioners has adopted the "Long-Term CO2 Reduction Plan" which calls for, among other things, improving the County's fleet fuel efficiency, thus reducing the CO2 releases associated with County operations; and

WHEREAS, vehicle emissions are the most significant local source of CO2, other greenhouse gases and particulates, and, in fact, represent the largest and most serious on-going unregulated introduction of pollution into the South Florida environment; and

WHEREAS, the County's "light-duty" fleet is generally replaced on a five year cycle; and

WHEREAS, the selection of vehicle types and models can have a significant impact on the daily operational costs of the County's "light duty" fleet over the useful lifetime of each vehicle purchased; and

WHEREAS, the County continues its related policy of locating Departments' new administrative offices at transit stations, along a constructed fiber optic "backbone", which provides a number of potential cost-saving advantages; and

WHEREAS, the County is preparing to purchase a large number of buses as part of the People's Transportation Plan and it is in the best interests of the County to consider ongoing fuel costs as well as the initial capital costs in its procurement process for those vehicles and other heavy-duty equipment to be powered by diesel fuel; and



WHEREAS, our employees' expanding ability to use e-mail messaging as a substitute for face-to-face meetings, existing electronic teleconferencing capabilities, and the increased availability of alternate fuel and hybrid vehicles represent relatively new tools available for reducing the County's consumption of gasoline, without affecting the provision of services, and improving the efficiency of administrative functions: and

WHEREAS, the Board of County Commissioners has consistently supported reasonable initiatives to improve the County's ability to provide effective services to our residents in the most cost-efficient and feasible available manner,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board:

Section 1. By no later than October 1, 2003, the County Manager shall develop and begin implementation of a plan to achieve a three to five percent (3% to 5%) average annual reduction from baseline FY 2001-2002 levels in the purchase and use of gasoline for the County's daily operations over the next five years.

Section 2. The County Manager shall provide an annual report to the Board of County Commissioners, detailing progress made toward the ultimate goal of reducing the County's total gasoline consumption by twenty percent (20%) in five years. The Board of County Commissioners may consider proposed revisions of its adopted goals for annual and total improvements in fuel efficiency, upward or downward, based on its review of the documented feasibility or capital costs of achieving those goals.

Section 3. The County Manager shall include language in the bid specifications for the County's purchase of buses and other heavy equipment powered by diesel fuel which give consideration to achieving a continuous improvement in the rolling average of fuel efficiency for the entire set of the County's mobile assets. The County Manager, in conjunction with the Citizen's Independent Transportation Trust, shall propose achievable specific goals for such long-term improvements as part of the first report required above.

Section 4. The County Manager shall require County departments requesting purchases of new vehicles to justify the type and model of new vehicle requested by the functional requirements of their expected use.

Section 5. The plan required hereby for reduction in the County's consumption of gasoline shall not be achieved by requiring or encouraging additional use of employee-owned vehicles in the conduct of County business.

Section 6. The plan shall strongly encourage other government entities who utilize County facilities and fuel resources for their own operations to adopt similar policies.

...

(Miami-Dade County – "Reduction In County's Consumption Of Gas Increase Fuel Efficacy": <http://www.miamidade.gov/govaction/matter.asp?matter=031449>)



C. LOCAL FLEET OPERATING PROCEDURES

Alachua County has developed a set of “Fleet Management Operating Procedures.” The stated purpose of the procedures is:

“To establish procedures and policies to ensure that the Alachua County Board of County Commissioners’ vehicles and motorized equipment are selected, acquired, utilized and maintained in a manner that provides the best possible support to county operations through economical and environmentally responsible fleet management.”

Below are some excerpts from this procedures manual:

Department Directors Shall:

Carefully assess department needs to minimize fleet size

Carefully plan vehicle and equipment usage to maximize efficiency and minimize mileage driven

Ensure that vehicles and motorized equipment requested for acquisition and use within their department are of the appropriate size and have only those items/accessories that are operationally required.

Re-enforce vehicle and equipment operator awareness to:

- *Reduce vehicle and equipment idling time*
- *Conservative driving habits such as gradual acceleration and strict adherence to speed limits*
- *Tire pressure, coolant and oils at the proper levels.*
- *Maintain the proper operator license and comply with all Federal, State and local laws relating to the operation of motor vehicles and equipment*

...

Fleet Manager Shall:

Establish a preventative maintenance (PM) program that incorporates:

- *Scheduling PMs that ensure minimum vehicle downtime.*
- *Manufacturers maintenance standards*
- *PM tasks directed towards energy efficiency, including regular filter changes, proper tire pressures, a tune up program that insures the engine is operating at peak efficiency.*
- *Designed for each vehicle or class of vehicles depending on its operating environment.*
- *Monthly, notify each department of vehicles past due for its scheduled preventative maintenance.*

...



Vehicle Acquisition Procedures:

The Fleet Manager shall have responsibility for acquiring Alachua County Board of County Commissioners fleet vehicles and equipment by a method that complies with Alachua County Purchasing Policies and with approval of the Public Works Director.

The Fleet Manager shall be responsible for determining the most cost efficient purchase of all fleet vehicles and equipment considering purchase price, maintenance, repair, operating costs and resale value. Acquisition of fleet assets shall be selected, acquired and utilized providing the best possible support of County operations and be environmentally responsible in accordance with the fleet “Green” Management Policy.

The using department shall conduct a needs analysis to determine the minimum size vehicle or equipment needed to meet departmental requirements based upon demonstrated need in the conduct of official business.

...

Vehicle Pools:

The Fleet Management office shall provide vehicle pool services to all county departments on a rental vehicle basis.


Each Director shall encourage vehicle pool assignments over individual vehicle assignments. Pools are a proven strategy in reducing fleet size and cost reduction.

...

Conduct an annual fleet utilization review. Using the break-even point for vehicle usage, the Fleet Manager shall recommend reassignment, rotation, removal from service or other actions to the Public Works Director, as appropriate.

...

RESOURCES

 Alachua County Fleet Management:
<http://www.fleetmanagement.alachua.fl.us/>



D. IMPLEMENT PURCHASING INCENTIVES FOR ALTERNATIVE FUEL FLEETS

Most alternative fuel vehicles (AFVs) currently cost more than conventional gasoline-fueled vehicles. To offset the additional costs, various governmental agencies and some utility companies offer tax credits, tax deductions, and incentives to the purchasers of AFVs. Besides the benefits of lower fuel and maintenance costs, AFVs can save energy, protect limited natural resources, and improve the health conditions within our communities.

1. Florida incentives for using AFVs

- a. Florida House Bill 1317 exempts state and local government AFV fleets from the decal fee.
- b. Florida Senate Bill 584 (1993) exempts certain suppliers of CNG from regulation as a motor fuel. This exemption does not apply to utilities regulated under the Florida Public Service Commission.
- c. Executive Order 91-253 established a clean fuels pilot program and encourages the state to implement a program to convert its fleet to alternative fuels. By 2000, all state fleet vehicles must operate on the "most efficient, least polluting" alternative fuels.
- d. Florida State Statute 403.706(4)(b) gives county governments waste reduction credits for using yard trash, clean wood waste, or paper waste as feedstock in the production of clean-burning fuels such as ethanol.
- e. Florida Senate Bill 2148 (1999) created the "Florida Clean Fuel Act." This established an Advisory Board within the Department of Community Affairs to study the use of alternative fuel vehicles and to formulate recommendations for the Secretary on expanding their use in Florida.
- f. New purchases of qualifying electric vehicles and clean-fuel vehicles (including gasoline/electric hybrids) are eligible for federal income tax incentives. Clean-fuel vehicles may be eligible for a one-time tax deduction of up to \$2,000, and electric vehicles may be eligible for a one-time tax credit of up to \$4,000 per vehicle.
- g. Securing funding is critical to a successful petroleum reduction program. Every year the Clean Cities Program offers the State Energy Projects (SEP) Clean Cities Special Projects solicitation. In addition EPA and DOE offer funding for a wide variety of projects that may include Alternative Fuel Vehicles. Grants and low interest loans from \$5,000 to \$30,000 per Alternative Fuel Vehicle, to support conversions and purchases, may also be available through the local Clean Cities Coalition Alternative Fuel Vehicle Revolving Loan and Grant Program.

RESOURCES

- 🔗 Clean Cities - State and Federal Incentives and Laws:
http://www.eere.energy.gov/cleancities/incen_laws.html ,
http://www.eere.energy.gov/cleancities/afdc/laws/incen_laws.html and
http://www.eere.energy.gov/cleancities/progs/afdc/search_state.cgi?afdcUS
- 🔗 Tax Incentives for Electric & Clean Fuel Vehicles at
<http://www.fueleconomy.gov/feg/>



- 🔗 Florida Solar Energy Center, Florida AFV incentives and laws at <http://www.fsec.ucf.edu/env/fscities/incentives.htm>
- 🔗 South Florida Regional Planning Council, Florida Gold Coast Clean Cities Coalition: <http://www.sfrpc.com/fgcccc/afv.htm>
- 🔗 Utility Fleet Management News: <http://www.ttnews.com/ufm/index.asp>
- 🔗 California Energy Commission, Incentives for AFVs at <http://www.consumerenergycenter.org/transportation/afv/incentives.html>



E. IMPLEMENT A MOTOR VEHICLE EMISSIONS AND FITNESS INSPECTION PROGRAM

Florida Motor Vehicle Inspection Program

The Motor Vehicle Inspection Program (MVIP) was an emissions inspection program established under the State of Florida Clean Outdoor Air Law and administered by the Florida Department of Highway Safety and Motor Vehicles, in conjunction with the Florida Department of Environmental Protection (FDEP). The program was intended as an integral part of the Department's program to control nuisance exhaust and to achieve and maintain the National Ambient Air Quality Standards for ozone, carbon monoxide, and particulate matter.

The inspection program was initially mandated by the Florida legislature for six Florida counties (Broward, Miami-Dade, Duval, Hillsborough, Palm Beach, and Pinellas) that had been designated as ozone non-attainment areas by EPA.

The inspection program identified passenger motor vehicles that had tailpipe emissions that exceeded the State of Florida standards for VOCs and CO. Vehicles that failed the emission test had to be repaired and presented for reinspection. Vehicles that passed were not due for another inspection until their next registration renewal date.

Vehicles that failed reinspection could be exempted for one year only, at which time they either had to be repaired or retired from service. In order to obtain the one-time waiver, the owner of the vehicle had to submit specific documentation required by the State and meet the requirements for exemption.

While the State set up MVIP inspection stations for the general public, they allowed qualified fleet operators to inspect their own fleet(s). These operators included auto dealers, government fleets, and private fleets. In addition, reinspections could be performed at State MVIP stations or state certified, independent reinspection facilities.

By the 1990's the MVIP had successfully reduced VOCs by an average of about 10% and CO emissions by an average of approximately 15%. As time progressed, there was a larger portion of the vehicles on the road that had been manufactured with lower emissions technology. The result was a general decrease in vehicle emissions, and the MVIP program was discontinued in the year 2000. Although certain emission requirements are still active, there is no longer an active annual motor vehicle inspection program.

RESOURCES

- 🔗 Florida Department of Environmental Protection: <http://www.dep.state.fl.us/air/pollutants/vehicles.htm>
- 🔗 EPA – Federal Register Item repealing MVIP: <http://www.epa.gov/EPA-AIR/2001/August/Day-02/a19162.htm>



SECTION III - EDUCATION

Education and training are possibly the most important factors that contribute to the successful implementation of any program, and are especially valuable in the “greening” of local governments and the communities that they represent. Educational efforts can focus on a variety of groups including:

- Fleet management and vehicle maintenance staff.
- Internal customers that utilize fleet vehicles.
- Businesses and other government agencies within the community that maintain fleets.
- Businesses within the community that perform vehicle maintenance work for individual customers, as well as members of the community that perform this work for them.
- Members of the community who are customers of local businesses that perform vehicle maintenance work.

Fleet managers for local governments will often be able to directly impact the first two of these groups. The other groups are often educated through other functional groups within a local government including environmental agencies or consumer services departments.

RESOURCES

- 🔗 University of Florida Center for Training, Research, and Education for Environmental Occupations: <http://www.treeo.ufl.edu/>
- 🔗 CCAR GreenLink – Safety and Pollution Prevention Online Training Program: <http://www.sp2.org/>
- 🔗 Florida Department of Education – Environmental Education: <http://www.firn.edu/doe/curriculum/environ/>
- 🔗 Florida Center for Solid and Hazardous Waste Management: <http://www.floridacenter.org/>
- 🔗 National Automotive Technicians Education Foundation: <http://www.natef.org/>



A. EDUCATE EMPLOYEES

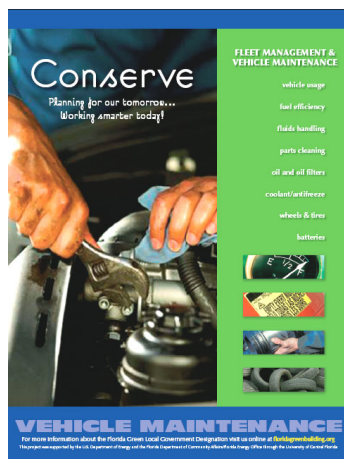
The first place to start an educational program is with employees. A successful and comprehensive pollution prevention effort relies on an established in-house educational program. Characteristics of such a program should include staff training, printed/recorded materials, and a certification process. This type of program aims at providing staff with current information on employee safety, environmental management, vehicle operation and maintenance, and vehicle efficiency. Assistance in implementing an educational program is available through federal, state, or local environmental programs, trade associations, environmental consultants, product vendors, and local or regional universities.

Basic environmental concepts that should be included are:

- Hazardous waste handling and management.
- Using personal protective equipment (PPE) and other safety equipment.
- Spill prevention and emergency planning.
- Reading and understanding Material Safety Data Sheets.
- Storm drains and storm water management.
- Air emissions.

Sources for educational materials include:

- Conferences and training seminars.
- Coalitions and trade associations; These can provide numerous benefits including forums for members to leverage their resources, develop joint projects, and collaborate on public policy issues. For example, the Clean Cities Coalition helps promote alternative fuel vehicles (AFVs), fuel blends, idle reduction, hybrids, and fuel economy in their communities. The program can also match buyers with sellers, and help create AFV markets.
- Trade journals and similar publications.
- Other employees; Employee Suggestion Programs that incorporate rewards can encourage employees to look for opportunities for continuous improvement.
- This module and related materials; Developed in conjunction with this module are posters that can be displayed to reinforce the concepts discussed in this document.



B. EDUCATE OTHER FLEET MANAGERS

Other fleet managers, including those managed by other local governments and by private sector organizations, can benefit from learning about the opportunities available to make their operations “greener” and more sustainable.

1. Lead by example and publicize success

Other fleet managers may be unsure about new technology or uncertain about how to implement a new procedure. By demonstrating the effectiveness of sustainable actions, local governments are able to encourage other fleet managers to follow their lead.

However, implementing actions is not enough. Local governments must promote and publicize their efforts. Some examples of methods to promote these activities are:

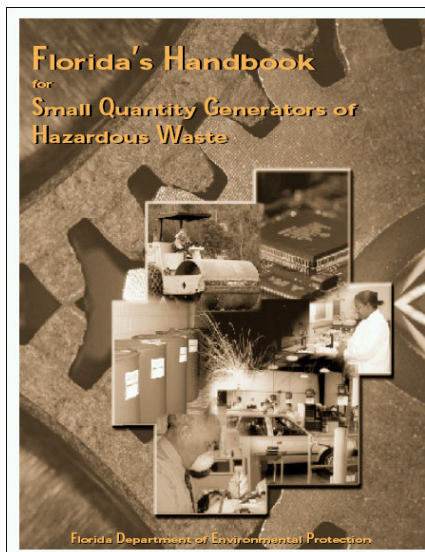
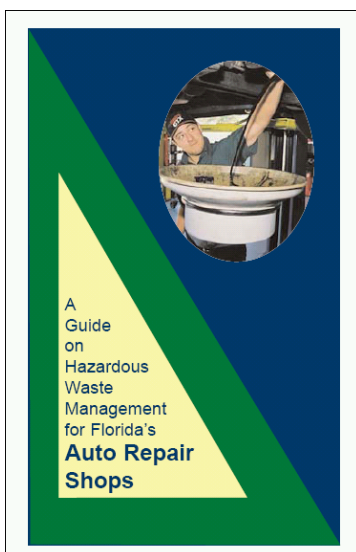
- Articles in community newsletters.
- Stories on local government access radio or television.
- Vehicle bumper stickers and placards.
- Presentations at trade association meetings.

2. Provide education during compliance inspections

Many local governments conduct environmental compliance inspections of facilities within their communities. Education should be a fundamental component of those inspections. This may include basic verbal explanations or handing out informative brochures. The importance of performing this function can be reinforced to inspectors by adding a checkbox or fill-in space to document what type of education was provided, as well as any actions taken by the facility.

RESOURCES:

- 🔗 Florida Department of Environmental Protection – Waste – Publications:
http://www.dep.state.fl.us/waste/quick_topics/publications/
- 🔗 Florida Center for Solid and Hazardous Waste Management – Brochures and Bulletins: http://www.floridacenter.org/brochures_bulletins.htm
- 🔗 Miami-Dade County DERM – Industry Guides:
http://www.miamidade.gov/derm/land/pollution_industry_guides.asp



C. EDUCATE THE PUBLIC

As consumers, members of the community can impact the environmental performance of vehicle maintenance businesses within the community by how they spend their dollars. As “do-it-yourselfers,” many residents of the community will be able to directly benefit from some of the concepts introduced within this document. Therefore, education of the public about issues related to vehicle maintenance is important.

Although education of the community about these issues is typically not the responsibility of the fleet manager of a local government, there are often other agencies within the local government that can serve this role. The fleet manager can assist by setting an example and also serve as a technical resource for those educating the community.

RESOURCES

- Florida Department of Environmental Protection – Waste –Used Oil :
http://www.dep.state.fl.us/waste/categories/used_oil/
- Miami-Dade County DERM –Tips – Used Oil:
http://www.miamidade.gov/derm/tips/you_help_dispose_oil.asp



Orange County Fleet Management Division

The employees of the Orange County Fleet Management Division are working diligently with the community to protect our environment. Fleet Management is committed to protecting the Central Florida environment by recovering and recycling the resources used at its maintenance facility. By recovering these resources, pollution and costs are substantially reduced. Some of the recovered resources are Freon, ethylene glycol, waste oil, diesel oil, scrap metal, paper, used tires, oil filters, and batteries.

(Orange County Fleet: <http://www.orangecountyfl.net/dept/as/fleet/>)

A Leaner and Greener Lee County Government Fleet Management Division

Lee County Government's Fleet Management Division is reportedly the only Florida county operation of this type to obtain a 100 percent non-hazardous waste generating status. In order to achieve this status the following procedures were put into place and are maintained on a daily basis:

- *Change their parts cleaning system, including switching to the use of parts washers with built-in distillation units*
- *Recycle used antifreeze on site*
- *Reuse Freon*
- *Eliminate chlorinated aerosol cleaners*
- *Recycle lead acid batteries and lead tire weights*
- *Provide separate catch containers for individual fluids to eliminate additional costs that would result from cross contamination*
- *Ensure proper labeling of all storage containers*
- *Establish and maintain a record keeping system for testing and disposal of waste streams*

Today, Lee County Government's Fleet Management Division is strong and financially stable. With a staff of 25 employees, Fleet Management maintains more than 1,200 vehicles that are used each day by the county's 25 departments and divisions to provide services to residents. The fleet includes everything from passenger cars, light duty trucks and commercial vans, to ambulances, graders and heavy-duty construction trucks and equipment. The division has an annual operating budget of \$4.8 million.

According to Lee County, "Creativity and innovation were the true keys to the fleet's rehabilitation. Our goal is to 'always be better.' When people think of the best fleet, we want them to think of us."

(Lee County Fleet: <http://www.lee-county.com/Fleet/environment.htm>)





FLEET MANAGEMENT RESOURCES

- 🔗 CCAR-GreenLink - National Automotive Environmental Compliance Assistance Center: <http://www.ccar-greenlink.org/>
- 🔗 Waste Reduction Resource Center - Waste reduction in auto repair & fleet maintenance: [wrrc.p2pays.org/industry/autorepair.htm](http://www.wrrc.p2pays.org/industry/autorepair.htm)
- 🔗 Pollution Prevention Resource Exchange P2Rx – Auto Repair Sector Hub: <http://www.p2rx.org/>
- 🔗 Clean Cities Coalition: <http://www.eere.energy.gov/cleancities/coalitions.html>

INDUSTRY ASSOCIATION RESOURCES

- 🔗 National Institute for Automotive Service Excellence: <http://www.ase.com/>
- 🔗 American Trucking Association and the Transportation Environmental Resource Center: <http://www.greentruck.com/>
- 🔗 Florida Automotive Industry Association: <http://www.faia.org/>
- 🔗 Florida Auto Dismantlers and Recyclers Association: <http://www.fadra.org/>

ENVIRONMENTAL MANAGEMENT RESOURCES

- 🔗 US EPA (Southeast Region): <http://www.epa.gov/region4/>
- 🔗 US EPA Office of Enforcement and Compliance Assistance – Profile of Local Government Operations: <http://www.epa.gov/oeca/resources/publications/assistance/sectors/notebooks/>
- 🔗 Florida Department of Environmental Protection: <http://www.dep.state.fl.us/> and <http://www.dep.state.fl.us/waste/>
- 🔗 Local Government Environmental Assistance Network: <http://www.lgean.org/>
- 🔗 Public Entity EMS Resource Center: <http://www.peercenter.net/>
- 🔗 Occupational Safety & Health Administration (Florida branch): <http://www.osha.gov/oshdr/fl.html>
- 🔗 University of Florida Center for Training, Research, and Education for Environmental Occupations: <http://www.treeo.ufl.edu/>

VEHICLE MAINTENANCE

For more information about the Florida Green Local Government Designation visit us online at floridagreenbuilding.org