

Strategies to Reduce Fuel Usage by Municipal Fleets



This is one of a series of fact sheets designed to help rural municipalities reduce fuel usage in their town fleets. For more information, please visit the UMass Clean Energy Extension (CEE) website, <https://ag.umass.edu/clean-energy>.

Reducing fuel consumption by municipal vehicles is an important way that Massachusetts cities and towns can save money while also helping the environment. However, reducing fuel usage can be challenging. Vehicle fuel consumption on average represents about 20% of total municipal energy usage for towns involved in the Massachusetts Department of Energy Resources (MA DOER) [Green Communities](#) program, but vehicle fuel usage reductions have represented just 2% of all energy reductions achieved by Green Communities to date. This issue presents particular challenges for small rural communities, where vehicle fuel usage can account for up to 35% of municipal energy usage.

This fact sheet provides a range of strategies for reducing fuel usage in municipal fleets, describes how each option can be most appropriately applied, and lists purchasing and funding resources. More details about these fuel-saving technologies can be found in other *Greening Municipal Fleets* fact sheets on our website.

Tracking Vehicle Fuel Consumption

A good first step in reducing municipal fleet fuel consumption is to understand where and when fuel consumption is occurring. This information can help municipal officials, staff, and volunteers to identify major sources of fuel consumption, and decide where to focus fuel usage reduction efforts. Options to monitor fuel use include:

- **Fuel Log** – The simplest way to track vehicle fuel use is to require municipal staff to maintain a fuel log, recording mileage and gallons pumped at each fill-up. A fuel log can be kept on a clipboard in each vehicle, with data entered quarterly or annually by municipal staff or volunteers. Fuel log templates are available on our website: <https://ag.umass.edu/clean-energy/fact-sheets/strategies-to-reduce-fuel-usage-by-municipal-fleets>
- **Electronic Fuel Management System** – For larger towns and cities with municipal fuel pumps, it may be simpler to purchase an electronic fuel management system, which can monitor fuel use for all vehicles using the municipal pumps. These systems typically require municipal staff to enter the odometer reading and a specific ID number identifying the vehicle at each fill-up. Some systems use cards specific to each vehicle, which eliminates the need for the employee to enter an ID number. The town of Belchertown, MA has installed an electronic system to track fuel usage by its municipal vehicles, see a case study here: <https://ag.umass.edu/sites/ag.umass.edu/files/case-studies/green-communities-case-study-belchertown.pdf>
- **Vehicle Telematics** – Vehicle telematics systems can be installed in individual vehicles. These systems track not only mileage and fuel consumption, but also other relevant information, like idling periods, acceleration and deceleration effects on fuel consumption, and maintenance needs. Through GPS tracking, telematics systems can also be used to optimize routes for vehicles like snow plows and garbage trucks. For more information, see our fact sheet *Telematics Software for Vehicles*: <https://ag.umass.edu/clean-energy/fact-sheets/telematics-software-for-vehicles>.

In the absence of data on municipal vehicle fuel consumption, it is usually safe to assume that for most rural communities, the major sources of fuel consumption are the police and highway departments. While a typical fire department also maintains a number of heavy-duty, low fuel economy vehicles, these vehicles are used relatively infrequently, and, according to our research, on average account for less than 10% of municipal fuel usage in rural communities.

Vehicle and Operation Management

There are a number of strategies for managing vehicle operation for better vehicle and fleet fuel efficiency. While simple, these strategies can lead to significant reductions in overall fuel consumption. One challenge with using these strategies is that their success relies on individuals to adopt behavioral changes and maintain good habits. Signage, written and verbal reminders, and encouragement are all important components of any program designed to promote behavioral changes.

- **Proactive Vehicle Maintenance** - Establishing and closely following a maintenance schedule for each vehicle in a fleet is one way to enhance fuel economy at little cost. Measures such as keeping engines tuned, ensuring tires are properly inflated, performing regular oil changes, and using the recommended grade of motor oil, can improve a vehicle's fuel economy by up to 9%, according to the U.S. Department of Energy. Typically, following the manufacturer's maintenance recommendations will result in optimal performance for a given vehicle. A variety of vehicle maintenance log templates are available for download from the web; smart phone apps are also available.
- **Anti-Idling Policies** - Unnecessary idling of vehicles is a wasteful and costly practice that harms both the vehicle and the environment; in fact, it is against the law to idle for longer than 5 minutes in the state of Massachusetts. Adopt and advertise anti-idling policies in your municipality, and incorporate anti-idling policies into staff contracts. Remind drivers in municipal fleets that idling is against department policy, and subject to a \$100-\$500 ticket. The DOER Clean Cities Coalition offers standard anti-idling pledge forms along with a number of other valuable idle reduction resources on their website: <https://cleancities.energy.gov/technical-assistance/idlebox>. The Massachusetts Department of Environmental Protection (MassDEP) also offers free anti-idling signage and materials to schools participating in their Green Team program: <https://thegreenteam.org>.
- **Green Driving Education** - Adopting good driving habits is another inexpensive and effective way to reduce fuel consumption. Excess weight on a vehicle can reduce fuel economy by 1-2% per 100 lbs, according to the U.S. Department of Energy. A loaded roof rack can reduce fuel economy by around 5% due to aerodynamic drag. Removing unnecessary equipment or loads as soon as it is practicable can provide significant energy savings. Aggressive driving habits, such as speeding, rapid acceleration, and abrupt braking, can also reduce fuel economy by up to 33%. Municipal fleets can encourage green driving by educating all drivers on efficient driving practices through workshops or informational materials. The University of Vermont offers an online "Eco-Driving 101" course to aid in this process, available here: <http://www.erating.org/transportation-company-education/courses>.
- **Route Optimization** - Selecting the shortest route between two points can minimize the amount of fuel consumed on a trip, saving both time and money. Route optimization can be effective for municipal vehicles with fixed (or somewhat fixed) routes, such as snow plows and school buses. While professional route optimization services are available, many telematics and GPS systems can also effectively map out the most efficient routes for a vehicle or set of vehicles. A study conducted by the University of Vermont Transportation Research Center found that after adopting GPS-based route optimization, snow plows across nine states were able to reduce their route length and associated fuel usage by an average of 5-10%.
- **Vehicle Rightsizing** - Vehicle rightsizing is simply ensuring that the size of a vehicle corresponds appropriately with the tasks that it performs. Most municipal departments require heavy-duty vehicles to accomplish certain tasks, but may also carry out administrative duties, errands, or light-duty tasks that can be accomplished with a small pickup truck or passenger vehicle. Using a smaller, fuel efficient vehicle whenever possible is a simple way to reduce overall fuel consumption, but requires municipal staff to be thoughtful about scheduling and vehicle needs for a given trip or workday.
- **Interdepartmental Coordination** – For small municipalities, light-duty tasks may not comprise enough of a single department's time to justify the cost of maintaining and insuring a fuel-efficient passenger car for departmental use. However, there may be opportunities to share fuel-efficient vehicles across departments. For example, a light-duty vehicle used by the police department for detective work could be loaned to fire department staff and volunteers to attend training in another part of the state. In addition to reducing municipal fuel consumption, such arrangements can reduce the need for municipal staff or volunteers to use personal vehicles, and reduce associated mileage reimbursement costs.

Purchasing a New Vehicle

The purchase of a new vehicle presents an excellent opportunity to increase the fuel economy of a municipal fleet and reduce overall fuel consumption. Unfortunately, fuel economy is often not considered during vehicle procurement. There are a number of reasons for this tendency: First, municipal vehicle purchase or replacement policies, if they exist in written form, often do not include consideration of fuel economy as part of the vehicle purchase process. Second, municipalities are not required to follow the fuel economy standards applied to state vehicle purchases. Even for municipalities with Green Communities status, the *Fuel Efficient Vehicle Policy* (FEV) currently in place has not been updated since 2012, despite increases in average fuel economy of approximately 5 MPG per year over the past decade. Many municipal vehicles are granted exemption from FEV requirements, including police cruisers, passenger vans, cargo vans, and all vehicles weighing more than 8500 lbs; for rural municipalities, these vehicles represent most if not all vehicles owned by the town. Third, municipal officials, staff, and residents involved in selecting or approving the appropriate vehicle for purchase may be unaware of available vehicle makes and models, and the specifications associated with these vehicles. Decision-makers may also be hesitant to adopt new technologies due to concerns about reliability or unfamiliarity with operations or repair.

New Vehicle Purchasing Policies

- **Vehicle Purchase and Replacement Policies** – Consider updating municipal vehicle purchase or replacement policies to include language that explicitly calls for consideration of vehicle fuel economy and evaluation of fuel-efficient, hybrid, or electric options during vehicle purchasing.
- **Fuel Economy Standards** – Consider adopting state fuel efficiency standards for all municipal vehicle purchases. The Massachusetts Operational Services Division (OSD) sets minimum fuel economy standards that all vehicles acquired by state agencies must meet. While stricter than Green Communities standards, these standards are still relatively moderate and achievable, and are updated regularly. Using these fuel economy targets as guidelines for municipal vehicle purchase can provide fuel savings, improve air quality, and lead to a greener fleet. OSD regularly releases a list of suggested vehicles consistent with their fuel economy guidelines. This list of recommendations can be cross-referenced with the VEH98 state contract (see *Using State Contracts* below), allowing fleet managers to determine which models are within their budget and available at a discount through the state contract.

OSD Fuel Economy Standards Website: <https://www.mass.gov/doc/fuel-efficiency-standard-for-state-fleet>

A recent list of recommended vehicles is available on our website: <https://ag.umass.edu/clean-energy/fact-sheets/strategies-to-reduce-fuel-usage-by-municipal-fleets>

Choosing a Fuel Efficient Vehicle

When identifying fuel efficient vehicle options for purchase, we recommend following the steps outlined below. Each section summarizes which types of vehicles a particular option is appropriate for.

- Right-size vehicle specifications to meet fleet needs.** When determining what tasks the vehicle will be performing, consider whether other vehicles are available to complete rarely-needed tasks, and determine vehicle specifications accordingly. For example, if a heavy-duty pickup is only needed occasionally, maintain only one heavy-duty pickup in the fleet. Additional pickups can be lighter-duty, more fuel-efficient models.
- Consider availability of electric vehicle models.** Practical options are available for light-duty/administrative uses, in which transportation is the main task for which the vehicle is required. Options are also available for other types of passenger vehicles, including school and shuttle buses.
- Consider availability of plug-in hybrid vehicle models.** Practical options are available for light-duty/administrative uses, as well as for police cruisers and light-duty pickup trucks. Options are also available for other types of passenger vehicles, including school and shuttle buses.
- Consider availability of hybrid vehicle models.** A variety of hybrid models are available, including compact cars, sedans, SUVs, minivans, full-size vans, and buses. Pursuit-rated police sedans and SUVs are now becoming available.
- Consider availability of alternative fuel vehicle models and fueling infrastructure.** Alternative or flex-fuel models of many heavy-duty vehicles are readily available. In some parts of the state, however, there are no fueling stations for these types of fuels, and there are few state incentives for purchase of these vehicles or associated infrastructure.
- Identify the most fuel-efficient conventionally fueled vehicle.** For medium and heavy-duty vehicles, especially specialized equipment such as loaders, fire trucks, and dump trucks, an electric, hybrid, or alternative fuel model may not be available. In these situations, significant fuel savings can still be realized by identifying the most fuel efficient

vehicle in its class which meets the necessary specifications. An improvement in fuel economy of only 1-5 MPG can result in significant savings for low fuel economy vehicles.

- For details on specific vehicle models currently available, please see our **Fuel Efficient Vehicle Purchasing Guide for Municipalities** (coming soon).
- For general information about vehicles powered by non-conventional fuels, see our fact sheets:
Hybrid, Hybrid Plug-In, and Battery Electric Vehicles: <https://ag.umass.edu/clean-energy/fact-sheets/hybrid-hybrid-plug-in-battery-electric-vehicles-general-overview>
Alternative Fuel Vehicles for Municipal Fleets: <https://ag.umass.edu/clean-energy/fact-sheets/alternative-fuel-vehicles-for-municipal-fleets>

Increasing Efficiency of New or Existing Vehicles

- ❑ **Consider availability of hybrid conversions and retrofits.** Hybrid and electric models of heavy-duty vehicles are often not available for direct purchase from the manufacturer, but after-market hybrid retrofits are available for medium and heavy-duty pickup trucks, cargo vans, buses, ambulances, and garbage trucks. Specific retrofit companies are approved and licensed by the vehicle manufacturer.
- ❑ **Consider whether idle-limiting technology or auxiliary power units could be added to the vehicle.** Idle reduction technologies are appropriate for vehicles that make frequent stops or require auxiliary equipment while parked, such as police vehicles, emergency vehicles, construction vehicles, and buses. These technologies can power down the engine during periods when it is not needed, and supply an alternative source of power to keep on-board equipment running when the main engine is off.

- For information about idle reduction technology and hybrid retrofits, see our fact sheet **Idle Reduction Technology:** <https://ag.umass.edu/clean-energy/fact-sheets/idle-reduction-technology>
- For details on specific vehicle equipment available, please see our **Fuel Efficient Vehicle Purchasing Guide for Municipalities** (coming soon).

Using State Contracts to Purchase Vehicles and Equipment

The Massachusetts OSD offers a wide variety of statewide contracts to municipalities, providing benefits including product discounts, extended warranties, and assistance in identifying environmentally-friendly products.

VEH98: Purchase of Vehicles

As of May 2018, the VEH98 contract offers over 500 different vehicle models to Massachusetts municipalities, at an average savings of 23% below MSRP, alongside vehicle accessories discounted up to 10%. The contract includes 21 different electric vehicle models.

Website: <https://www.mass.gov/files/documents/2018/11/21/VEH98.pdf>

Questions? Contact the contract manager: David Sargeant, david.sargeant@mass.gov, 617-720-3118

VEH102: Advanced Vehicle Equipment, Supplies, and Services

This contract offers municipalities a wide range of discounts on electric vehicle charging stations, as well as other fuel-saving and environmentally-friendly vehicle accessories, including idle reduction technology.

Website: <https://www.mass.gov/files/documents/2018/11/09/VEH102.pdf>

Questions? Contact the contract manager: Ted Dobbin, Edward.Dobbin@mass.gov, 617-626-7383

Massachusetts-Based Funding Programs

Massachusetts Green Community Designation and Grant Program

More than half of the municipalities across the state of Massachusetts have opted to join the Green Community Program since its launch in 2010. As a designated “Green Communities,” municipalities are able to receive both funding and guidance from the state in pursuit of improved energy efficiency and clean energy. Once designated, municipalities receive an initial grant of up to \$125,000 to fund energy efficiency projects in both municipal buildings and municipal fleets. Subsequently, municipalities are eligible for additional funds through competitive grant competitions, which can include financing of electric vehicles, electric vehicle infrastructure, and energy conservation measures in vehicles, including idle reduction, vehicle telematics, and hybrid retrofits.

Website: <https://www.mass.gov/guides/becoming-a-designated-green-community>

Massachusetts Electric Vehicle Incentive Program (MassEVIP)

MassEVIP is an open-enrollment grant program administered by the Massachusetts Department of Environmental Protection (MassDEP), providing incentives to eligible state and municipal entities for the acquisition of electric vehicles, zero-emission electric motorcycles, and the installation of Level 2 dual-port charging stations. To date, MassEVIP has provided 83 separate entities with nearly \$2.3 million in funds to acquire 267 electric vehicles and 92 dual-port charging stations.

Website: <https://www.mass.gov/how-to/apply-for-massevip-fleets-incentives>

Volkswagen Diesel Settlements

Due to the 2015 emissions scandal surrounding Volkswagen vehicles, Massachusetts will receive \$75 million from the VW Settlement Trust. The Massachusetts Department of Environmental Protection (MassDEP) has announced a plan for how to utilize these funds, which includes replacing older, inefficient diesel equipment and funding electric vehicles and charging infrastructure.

Website: <https://www.mass.gov/guides/volkswagen-diesel-settlements-environmental-mitigation>

MAPC Green Mobility Group Purchasing Program

The program supports municipalities and other public entities in the transition of their fleets to clean fuels. In collaboration with MA DOER and MA OSD, the Metropolitan Area Planning Commission (MAPC) formed a partnership with XL Hybrids, to offer state and municipal entities bulk and accelerated time-frame discounts for after-market hybrid electric conversions. This program utilizes hybrid conversion options available through state contract VEH102, compatible with 14 Ford vehicle models, common among Massachusetts municipal fleets. Hybrid electric conversions can allow fleets to improve fuel efficiency without sacrificing vehicle performance and functionality.

Website: http://www.mapc.org/wp-content/uploads/2017/12/XL-Group-Purchase-FAQ-Flyer_09-28-17.pdf