

The University of Texas at Austin Energy Savings Program for Fleet

Introduction

The University of Texas at Austin manages a fleet of 624 vehicles. During fiscal year 2004-2005, the fleet traveled 2,457,903 miles and used 216,414 gallons of fuel. The average fuel economy for the year was 11.36 miles per gallon. With the continued increase in the price of fuel, it is imperative that the University develop and implement a comprehensive fuel savings program for our fleet that reduces overall energy expenditures.

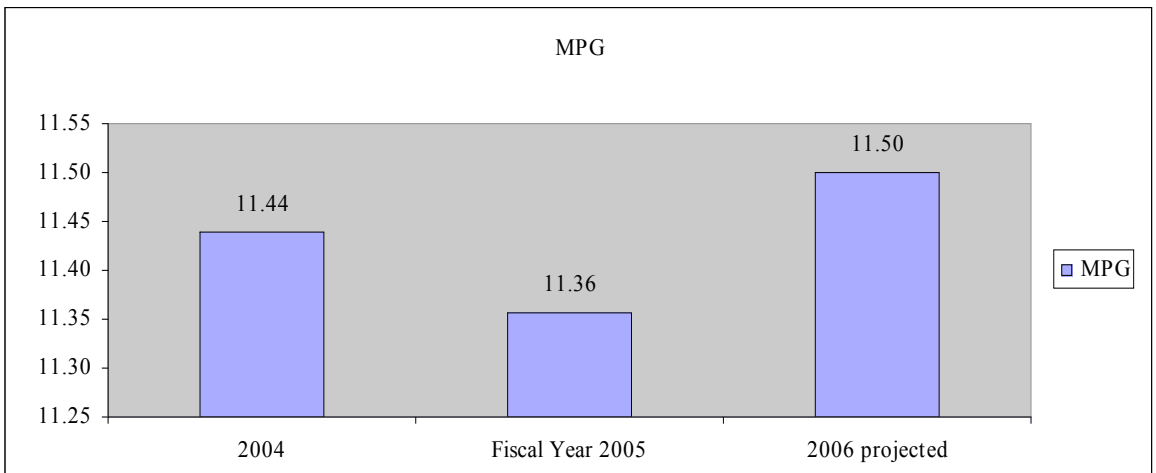
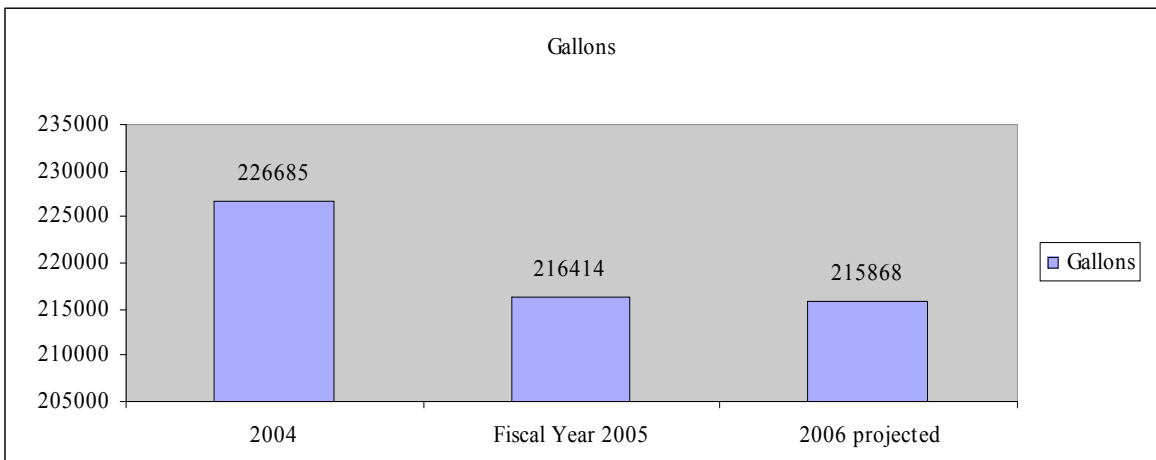
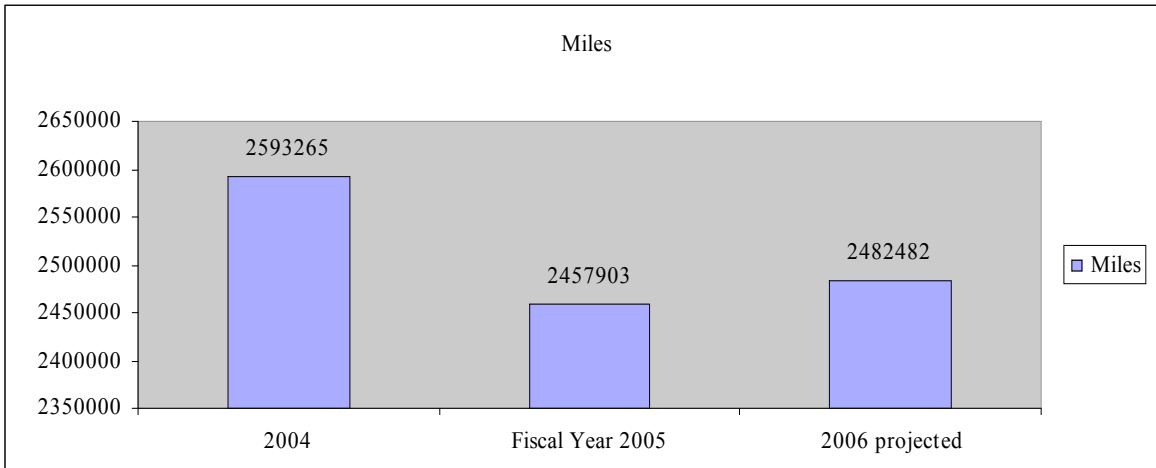
Goals

There are three areas where the University can save on vehicle fuel consumption – proper maintenance, efficient driving habits, and intelligent purchasing of vehicles. By employing an effective preventative maintenance program, training our people on the best operating practices, and purchasing the right size vehicle for the given assignment, the University will improve our fuel economy by 1.2% from 11.36 miles per gallon in 2005 to 11.50 in 2006.

Discussion

The average age of the fleet is eleven years. Given the current replacement trends, the fleet will continue to grow in age, and fuel economy may suffer as a result. With total miles projected to grow about one percent per year, dependence on foreign oil will continue to rise unless the use of alternative fuels is expanded and/or new strategies are implemented to improve our fuel efficiencies.

The University is planning to increase the use of alternative fuels in 2006 including propane, E85, and biodiesel. Recently, Physical Plant commissioned a new propane tank for vehicles and small engine use. Our challenge in 2006 with E85 will be to find another local government agency that will help us reach the critical mass needed to convert one of our current gasoline tanks to E85. We are also hopeful that one of our suppliers will receive blend approval necessary for the continued use of biodiesel. However, alternative fuels will not reduce overall fuel consumption. What follows are 2006 strategies that will not only prevent growth in fuel consumed, but will reduce usage from 2005 levels.



Strategies

Preventative Maintenance

- Maintain the current preventative maintenance program based upon the manufacturers' recommended frequency.
- Track each vehicle for timely compliance on PMI's.
- Develop queries from the fleet data management system to identify poor performing vehicles.
- Utilize the newly purchased diagnostic equipment to maintain maximum MPG.
- Review, maintain, and expand as needed the Best Practices – UT Automotive Shop and Vehicle Maintenance (see attached).

Driving Habits

- Continually develop the best fuel efficient operating practices for University drivers (see attached).
- Implement a mandatory weekly tire pressure inspection by vehicle.
- Educate all University drivers on Best Practices.
- Post the Best Practices on the Fleet Web Site.
- Monitor and post fuel consumed, miles driven, and MPG quarterly on the Fleet Web Site.

Purchasing

- Purchase the appropriate class of vehicle and engine size offering the highest fuel economy from the state contract while maintaining the mandate that 75% of the light duty vehicle acquisitions are alternative fuel capable.
- Take advantage of new technologies for fuel efficiency by reducing the age of the fleet.
- Implement an optimum life cycle plan by vehicle class to stay current with new technology offerings.
- Utilize the Best Practices for Purchasing a Vehicle (see attached).
- Evaluate the purchase of hybrid vehicles for our planned motor pool.

Best Practices for Vehicle Maintenance*

Proper vehicle care and maintenance will save money and conserve fuel. Tune-ups and a regular maintenance program can save 4% on average in fuel.

Tests by the automobile industry have demonstrated a tune-up, on vehicles judged to be in need of one, increased fuel economy by over 11%. The same tests also revealed that of the vehicles checked, $\frac{3}{4}$ had maintenance deficiencies that adversely affected fuel economy, emissions, or performance. A regular maintenance program should at least include:

1. Change the oil and filter as recommended. Using the recommended motor oil can improve gas mileage by 1-2%.
2. Be sure the tires are properly inflated. Under-inflated tires can cost as much as 1 mpg. Generally, studies indicate that keeping proper air pressure can improve your gas mileage by 3.3%. Better mileage can be achieved by over-inflating the

- tires (never exceed the maximum inflation pressure on the side of the tire), but the tires will wear faster and the ride will be rougher.
3. Be sure to use the manufacturer's recommended tire size. This not only affects fuel economy but also affects the ABS function.
 4. Replace spark plugs at regularly scheduled intervals. New plugs alone can increase fuel economy by 3%.
 5. Be sure the plugs are the correct type and properly gapped.
 6. Be sure the ignition timing is set to specifications.
 7. If the vehicle does not have electronic ignition, check the points, rotor, and cap in the distributor as specified.
 8. Replace the air filter regularly. A dirty air filter enriches the air/fuel mixture and can increase fuel consumption as much as 10%. Tests show one third of all vehicles have air filters in need of replacement.
 9. Replace the fuel filter at least as often as recommended.
 10. On carbureted vehicles, be sure the idle speed and carburetor fuel mixture is set to specifications.
 11. On carbureted vehicles, check the automatic choke. A sticking or malfunctioning choke wastes fuel.
 12. Replace the PCV valve at regular intervals.
 13. Service the cooling system at regular recommended intervals.
 14. Be sure the thermostat is operating properly. A thermostat that is stuck open delays engine warm-up, and a cold engine uses twice as much fuel as a warm engine.
 15. Be sure the drive or serpentine belts (especially the fan belt) are in good condition and properly adjusted.
 16. Be sure the battery is fully charged for fast starts.
 17. Use "Energy Conserving" type motor oil.
 18. Be sure the wheels are properly balanced.
 19. Be sure the front and rear ends are correctly aligned. Misalignment actually has wheels going in different directions creating additional drag.
 20. Correctly adjust the wheel bearings. Wheel bearings adjusted too tight increase rolling resistance.
 21. Check the radiator cap for a cracked or worn gasket. If the cap doesn't seal properly, the cooling system will not function properly.
 22. Check the spark plug wires for cracks and burned or broken insulation. Cracked wires decrease fuel efficiency by failing to deliver full voltage to the spark plugs.

Best Practices for Driving*

Before driving your vehicle, make sure it is properly maintained. Bring your vehicle promptly to the shop when you are notified of a scheduled preventative maintenance inspection or when you notice a change in the performance of the vehicle. Tune-ups and a regular maintenance program can save 4% on average in fuel. Keep your front suspension and steering properly aligned and repair body damage.

Be sure the tires are properly inflated. Under-inflated tires can cost as much as 1 mpg. Generally, studies indicate that keeping proper air pressure can improve your gas mileage by 3.3%. Make sure the tires are checked for proper pressure at least once per month and every time the vehicle is fueled.

Don't use premium fuel if your car does not require it; using it is an unnecessary expense. Getting the best fuel economy depends not only on how the vehicle is maintained, but also on how it is driven. Here are some fuel-saving driving tips to follow:

1. Avoid extended warm-ups. Modern engines do not require it. As soon as your vehicle is drivable, accelerate gently and slowly until the vehicle is fully warmed.
2. Don't drive fast until the engine has fully warmed to normal operating temperature.
3. Don't carry unnecessary equipment and minimize drag. Weight is the largest single factor in fuel usage, and every extra hundred pounds in cargo costs about 1% in fuel economy. Keep your trunk and backseat clear of any unnecessary items.
4. Avoid unnecessary idling. One minute of idling uses more fuel than it takes to restart the engine. Prolonged idling uses fuel at the rate of about $\frac{1}{2}$ gallon per hour. During a six-month span in 2005, Safelite Group, an auto glass service company, decreased gasoline usage in their fleet of vans and light duty trucks by 6% after implementing a corporate initiative, called "Turn It Off – Idling Gets You Nowhere." Remember, when you idle, you get "0" mpg.
5. Avoid sudden stops and starts. Hard acceleration uses up to one third more fuel. Achieve your desired speed with a steady foot on the accelerator and try coasting to stop. Speeding, rapid acceleration, and braking can lower your gas mileage by 5% at lower speeds around town, and by 33% at higher highway speeds.
6. Don't vent your anger behind the wheel. Aggressive acceleration wastes fuel and can be dangerous as well.
7. Drive at a steady pace. Plan your route to avoid stop-and-start conditions and heavy traffic. Be aware of the traffic around you and adjust your driving to avoid constant acceleration and deceleration.
8. Many traffic light systems are "timed" for a given speed. Try to pace your speed to make the green lights rather than going faster and stopping for red or yellow lights.
9. The best fuel economy is obtained at moderate speeds. More fuel is consumed below 35 mph than at 45 mph, and generally, you'll lose 1 mpg for every 5 mpg over 50.
10. Try to anticipate traffic jams and avoid them when possible. Despite stops for traffic signals on other roads, avoiding those expressway traffic jams can lower

- fuel consumption as much as 50%. Listen to radio reports for alternate routes around congested areas.
11. Avoid excessive braking. The need for braking can often be eliminated by downshifting or simply taking your foot off the accelerator pedal.
 12. Carpool whenever possible or practical.
 13. Combine several short trips into a single trip. Short trips (fewer than 5 miles) don't let the engine reach its most efficient operating temperature. By combining numerous short trips, you can save on the total miles driven and take advantage of the vehicle's more efficient warmed-up condition.
 14. If you own more than one vehicle, use the most economical, especially for commuting or stop-and-go driving.
 15. Use the transmission properly. If your vehicle has a manual transmission, shift gears as soon as the engine can run smoothly in the next gear. Low gear at 20 mph gives only about two-thirds the mileage as high gear at the same speed. In second gear, it is four-fifths the mileage you'd get in high. With an automatic transmission, lifting your foot slightly off the accelerator will make the transmission shift sooner.
 16. When approaching hills, don't wait until the vehicle begins to "lug" before shifting gears. Don't accelerate once you have started up the hill, because speed increase is slight and fuel consumption is high. You can minimize the speed loss by gradually increasing speed as you approach a hill.
 17. If equipped, use the cruise control. A cruise control can gain 1-2 mpg by maintaining a steady, preset speed over any kind of terrain.
 18. Relax while driving. Find a comfortable driving position; fidgeting in the seat leads to constant speed changes and decreases fuel economy.
 19. If you drive a manual transmission vehicle, start in second when going downhill.
 20. Keep accurate records. Over a period, you can check your fuel economy; a sudden drop in miles per gallon may mean it's time for a tune-up or other maintenance.

Best Practices for Purchasing a Vehicle*

Fuel consumption is the biggest contributor to operating cost, and it should be a primary consideration when buying a vehicle. The University recommends consulting with Fleet Management before any requisitions are created. Some things to remember about options and fuel economy are:

- **How you will use the vehicle** – Your driving needs may be adequately served by a compact instead of a full-size vehicle.
- **Engines** – Smaller engines generally require less gas than larger V8s, but an under-powered vehicle will use more gas than one with sufficient power.
- **Transmissions** – If used properly, a manual transmission can provide up to 8% better mileage than an automatic, in city driving. At highway speeds, the difference is negligible.
- **Axle ratios** – Numerically higher axle ratios give more power, but numerically lower ratios save fuel at highway speeds because the engine doesn't have to rotate as many times.
- **Weight** – The lighter the vehicle, the less fuel it will use. On an average vehicle, every extra hundred pounds will cost about 1% in fuel economy.

- **Cruise control** – If you do a lot of highway driving, a cruise control can gain 1-2 mpg for those drivers who do not maintain a constant speed.

Source: ProCarCare.com

Last updated: 3/8/06