

GREENING GOVERNMENT TRANSPORTATION EFFICIENCY AUDIT

PREPARED BY

THE GREENING GOVERNMENT COORDINATING COUNCIL

IN CONJUNCTION WITH



**Colorado Department of
Personnel & Administration**

Customers • Credibility • Communications

**Colorado Department
of Public Health
and Environment**



Governor's
Energy Office

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Dear Governor Ritter:

The Greening Government Coordinating Council is pleased to provide you with this summary of our Transportation Efficiency Audit (TEA), which was completed December 1, 2007. The audit evaluates current state fleet management practices and provides recommendations to achieve the Greening Government goals established by Executive Orders D 011 07 and D 012 07.

A TEA workgroup, consisting of representatives from the Department of Personnel and Administration, the Colorado Department of Public Health and Environment, the Colorado Department of Transportation, the Governor's Energy Office, and the Greening Government Coordinating Council collaborated to complete the TEA report and develop recommendations.

The Greening Government goals addressed in this report are as follows:

- By June 30, 2012, achieve a 25 percent volumetric reduction in the petroleum consumption of state vehicles measured against a fiscal year 2005-2006 baseline.
- Improve the environmental efficiency of the state fleet.
- Restrict the purchase of four-wheel drive vehicles, except where necessary.
- Prioritize replacement of pre-1996 light duty vehicles with a city fuel efficiency rating of less than 25 miles per gallon.
- Acquire hybrid gas/electric high efficiency vehicles and other fuel efficient/low emission vehicles whenever practicable.
- Develop an employee education plan to increase the use of ethanol blended and bio-diesel fuels.
- Improve the overall efficiency of acquiring, using, and maintaining fleet vehicles.

Achieving the 25 percent volumetric reduction in petroleum consumption will be a challenge, given that the state fleet is expected to increase in size between now and 2012 due to anticipated programmatic increases during this time period. Moreover, because vehicles typically remain in the fleet for eight to ten years, the majority of the vehicles in the fleet today, many of them with poor fuel efficiency, will remain in the fleet throughout the performance period.

Regardless, the work group developed a strategy to achieve the goal. The Greening Government Coordinating Council believes your support of this plan is critical to its success. Thank you for your consideration.

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Petroleum Reduction Goal

The petroleum-reduction goal is based on state fleet vehicle data for fiscal year 2005-06, as required by Executive Orders D 011 07 and D 012 07.

Included in the data

Vehicles managed by the Department of Personnel and Administration, State Fleet Management (SFM).

Unleaded fuel consumption as reported by the state’s fuel card vendor, Wright Express.

Actual vehicle miles traveled.

Vehicles operated by the 19 executive departments.

Vehicles operated by colleges and universities who participate in DPA’s fleet management program.

Excluded from the data

Vehicles not managed by SFM (University of Colorado, Fort Lewis College, Colorado State University, and Department of Agriculture Brands Division.)

Law Enforcement, emergency response, road maintenance, and highway construction vehicles.

Ethanol (E85) and biodiesel fuels, because biofuels were used infrequently and not reported separately during the baseline year 2005-2006.

122 vehicle records that were removed due to poor data integrity (fuel reported by Wright Express was erroneous).

Baseline Fiscal Year 2005-2006 Data

- 3,821 vehicles which includes
 - 293 flex-fuel
 - 17 hybrid sedans
 - 5 hybrid sport utility vehicles
- 44,391,364 vehicle miles traveled
- 2,555,734 gallons of unleaded gasoline
- Average fuel efficiency 17.4 miles per gallon

Vehicle Types	Quantity	% total fuel used	Average MPG	Average miles / vehicle / year
Sedans, Station Wagons	1,005	19.1%	25.4	12,326
SUVs, Mini Vans	1,122	29.7%	18.3	12,383
Light Trucks, Small Cargo Vans	1,085	35.3%	14.8	12,338
Heavy Trucks, Large Cargo Vans	609	15.9%	11.6	7,755
Total	3,821		Average 17.4	Average 11,618



Plan to Reduce Petroleum Consumption

The work group recommends a four-prong approach to reduce petroleum consumption in the state fleet:

- Reduce Vehicle Miles Traveled
- Efficient Fleet Configuration
- Increase the use of biofuels
- Improve vehicle and driver efficiency

Reduce Vehicle Miles Traveled (VMT)

If each of the state vehicles analyzed in this report were driven a mere ten fewer miles per week, we would eliminate almost two million vehicle miles traveled per year, and save 115,000 gallons of fuel annually.

Action Plan

The Greening Government Coordinating Council (GGCC) in conjunction with State Fleet Management (SFM), will develop a VMT reduction outreach and education program for state employees.

Each department, college, and university (organization) will provide their VMT reduction targets to the GGCC.

Each organization will institute a detailed trip log to be completed daily and regularly reviewed by the organization's designated energy manager.

The GGCC in conjunction with the Governor's Office of Information Technology will identify gaps in or barriers to providing teleconference, video conference and web tools, which will allow organizations to use technology rather than drive to meetings.



Fleet coordinators will report VMT monthly to executive directors, agency energy managers, and the Greening Government Program Manager.

Each organization will document and review established routine vehicle routes, such as mail delivery, and combine or eliminate routes where possible.

Recommended Greening Government Policies

Organizations that provide RTD Eco Passes will require employees to use the RTD skyRide to Denver International Airport, rather than using a state vehicle or reimbursement of mileage and parking expense.

Require "commuter" vehicle drivers to reduce the number of vehicle miles traveled per fiscal year by seven percent annually, to reach a 25 percent reduction in VMT by June 30, 2012.

The will work with SFM to develop a six month evaluation of mounted global positioning systems (GPS) to improve the routing and efficiency of state vehicles. SFM and the GGCC will evaluate the results and recommend continuation of the program if successful.

Efficient Fleet Configuration

The State's fleet serves a wide variety of programs, performed in a myriad of conditions. The vehicle must be correctly sized and equipped to perform the job and suitable to ensure the safety of the occupants.

A variety of vehicle types; hybrid, flex fuel, diesel, small, medium, and large will continue to serve the state's operations. The key is to use the most efficient vehicle possible to meet the programmatic need.

Both a hybrid and an alternate fuel vehicle (AFV) provide petroleum reductions compared to similar conventional vehicles. A hybrid provides a "guaranteed" petroleum reduction, because its fuel efficiency is often twice that of a similar conventional vehicle regardless of the fuel type used.

An AFV only provides petroleum reductions when biofuel is used. Flex Fuel Vehicles (FFV) running on unleaded fuel provide no petroleum reduction benefits. For that reason, where both an AFV and a hybrid are suitable replacement vehicles, the workgroup's petroleum-reduction strategy gave preference to the hybrid.

The workgroup projects that the replacement vehicle requests must include the purchase a minimum 193 hybrids each year beginning FY 2008-2009, in order to achieve the 25 percent reduction.

As a result of this report, the SFM replacement request includes the purchase of 216 hybrid vehicles.

Action Plan

SFM and the GGCC will conduct an in-depth investigation of individual vehicles and related job functions to determine the vehicle type best suited for the programmatic need.

The GGCC representatives of departments with locations within five miles of each other shall meet with their respective department fleet coordinators and budget analysts to explore car sharing across agencies.

Recommended Greening Government Policies

Require employees to use the most appropriately sized vehicle to conduct day-to-day business and use motor pool or rental vehicles for the occasions when a specialty vehicle is required.

Correlate vehicle type with the job function. Include that information in the position description questionnaire (PDQ). Assign vehicles as stated in the PDQ, not based on individual preferences.



Image from Autobyte1.com



Increase the use of biofuels

The use of E85 and biodiesel is a critical component of the state fleet petroleum reduction strategy.

As of late 2007, SFM had successfully acquired approximately 500 FFVs. However, between March and September 2007, these vehicles used less than two gallons of E85 per vehicle per month. This is due in part to lack of driver education, and in part to a lack of E85 infrastructure. Colorado's 50th E85 retail site opened in January 2008.

The workgroup projections assume that by June 2012, state-owned FFVs will fuel with E85 a minimum of 50 percent of the time, and that approximately 220 FFVs will be added to the fleet each year through the vehicle replacement process. SFM requested 468 FFVs for FY 2008-2009.

The projections assume that the fleet will add 20 or more light-duty diesel vehicles beginning with FY 2009-2010, and that those vehicles will use a minimum blend of B20 at least 50 percent of the time.

Action Plan

Develop an employee education plan to increase the use of ethanol blended and biodiesel fuels.

Clearly mark all flex fuel vehicles with a sticker covering the fuel door, which indicates that this vehicle is to be fueled with E85.

Require all flex fuel drivers to sign an agreement to use E85 when available prior to accepting the vehicle.

Use the tools available through Wright Express to track, monitor and report fuel consumption. Report statewide quarterly fuel consumption data on a division - by - division basis.

The GGCC will partner with the Governor's Biofuels Coalition (GBC) to map the location and number of state-owned AFVs in relationship to state facilities and biofuel sites.

Determine the feasibility of converting the state's central motor pool unleaded pump to an E85 pump. If feasible, apply for funding through the GBC.

Identify additional sites where state-operated biofuels stations exist or the opportunity to locate a station exists.

Execute formal agreements with political subdivisions to share alternative fuel sites.

Working with the GBC, encourage private-owned E85 and biodiesel fueling sites in strategic locations.

Continue to review opportunities to add AFVs, such as electric and compressed natural gas vehicles in the fleet.

If 220 conventional vehicles are replaced with FFVs each year (2009-2012) and E85 is used at least 50% of the time, the state will reduce petroleum consumption by 200,000 gallons

Improve Vehicle and Driver Efficiency

A vehicle driver can achieve improved fuel economy if he or she avoids quick starts, does not idle the vehicle unnecessarily, and uses good planning to identify the most efficient route.

Routine vehicle care, such as ensuring that tires are inflated properly will also improve fuel economy.

Action Plan

In early 2008, SFM will conduct focus groups with state vehicle drivers to learn about driving habits and develop efficient-drive educational material.

SFM will create and deliver communication pieces and training content to improve driver efficiency.

Institute a tire pressure check program.

DPA requested one additional FTE to provide oversight and education concerning the state's petroleum reduction strategies and related fleet-efficiency programs.



Recommended Greening Government Policies

Require downtown motor pool users to use alternate-fuel or hybrid vehicles, unless one is not available or does not meet a specific need.

Develop and implement an anti-idling policy. State Fleet Management will provide recommendations for enforcement and oversight.

Improperly inflated tires can reduce fuel efficiency by as much as one mile per gallon.

Fiscal Impact

As with any conservation measure, using fewer resources means lower costs. The State can expect to save money by using less fuel. Moreover, fewer vehicle miles traveled means less wear and tear on vehicles, thus reducing costs of maintenance and replacement items, such as tires.

The following table represents a summary of the petroleum reduction strategies and recommendations provided in this report. Detailed calculations are available through the Governor's Energy Office.

Category	Gallons Petroleum Reduced	Percent Change	Miles	Petroleum Consumed
Baseline FY 2005-06			44,391,364	2,300,161
"Business as Usual" Increase in vehicle miles traveled 2008-2012		(approx.) 12.7%	50,030,834	2,592,373
Reduce Vehicle Miles Traveled				
Conservation Measures:				
Virtual meeting place - Web, video and teleconference				
Public transportation				
Car pooling for business				
Improve trip routing				
Eliminate unnecessary trips				
Total Reduction in Vehicle Miles Traveled		-12.0%	44,027,134	2,281,288
Fleet Configuration and Use of Bio-fuels				
Hybrid gas-electric vehicles (HEV)	-158,644	-7.0%		
Flex fuel vehicles (FFV) – Fuel with E-85 50% of the time	-200,661	-8.8%		
Diesel vehicles – Fuel with B-20 50% of the time	-18,442	-0.8%		
Total Fleet Composition and Bio-fuels	-377,747	-16.6%	44,027,134	1,903,541
Maximize Efficiency				
Improve Vehicle fuel efficiency				
Improve Driver fuel efficiency				
Total: Maximize Efficiency		-9.0%	44,027,134	1,732,222
Grand Totals				
Total miles and petroleum consumed in FY 2011-12 for baseline vehicles			44,027,134	1,732,222
2006 Baseline miles and consumption			44,391,364	2,300,161
Change from 2006 Baseline			-364,230	-567,939
Percentage Change from 2006 Baseline			-0.8%	-24.7%

Environmental Efficiency of the State Fleet

The related greenhouse gas (GHG) emissions for this group of 3,821 vehicles is 49,653,176 pounds (22,570 metric tons) of carbon dioxide (CO₂), 117,402 pounds of hydrocarbon (CH), and 76,816 pounds of nitrous oxide (N₂O).

CO₂ emissions for unleaded gas are calculated by multiplying the number of gallons of fuel burned by 19.4 pounds.

Vehicles that burn less fossil fuel will emit less carbon dioxide. Current indications are that vehicles using primarily E85, while using more fuel to go the same distance as a gasoline powered vehicle, emit slightly less carbon dioxide when considering the life cycle of the fuel.

On November 20, 2007, federal regulators officially found the Denver area in violation of federal ozone limits and refused to grant the city another extension to meet regulations. State employees must lead by example to reduce ozone levels across the state, especially in Denver. They can take action by driving less, both for personal and business reasons.

The Colorado Department of Public Health and Environment and the National Renewable Energy Laboratory are currently conducting tests on two state fleet FFVs to determine the effect of E85 on ozone levels. As of this time, those tests are inconclusive.

As the technology to control emissions improves, newer cars emit less pollution. A vehicle model year 2000 and newer

has average hydrocarbon and nitrogen oxide emission rates totaling about one tenth those of a 1990 - 1999 vehicle. A pre-1990 vehicle is about twice as dirty from an emission standpoint as the 1990's vehicle and 20 times dirtier than today's cars.

Purchasing newer vehicles will result in significant decreases in hydrocarbon and nitrogen oxide emissions. Meeting a goal to reduce the emissions footprint of hydrocarbons and nitrogen oxides will be relatively easy over the next five to ten years as a significant number of the fleet's pre-2000 vehicles will be replaced.¹

1,745 of the 3,821 vehicles in the baseline are model year 1999 or older.



Action Plan

Continue to support Colorado's Climate Action Plan, an ambitious call to action that establishes firm goals and clear strategies to reduce harmful greenhouse gas emissions.

Use petroleum-reduction strategies to reduce the fleet's environmental impact.

Monitor and respond as appropriate to continuing E85 studies.

¹ Analysis of State of Colorado Fleet Emissions Air Pollution Control Division CDPHE November 12, 2007

Restrict the Purchase of Four-Wheel Drive Vehicles, Except Where Necessary.

Information provided by fleet managers, state employees and Greening Government Coordinating Council (GGCC) members, indicates that fleet purchasing decisions are often based on “highest” rather than “lowest” need.

For example, if a 4x4 vehicle is needed 10 percent of the time, the agency or division will purchase the 4x4 and drive it 100 percent of the time.

Action Plan

Executive Director’s approval is required for the purchase of a four-wheel drive vehicle.

The GGCC will develop a strategy to pool low-efficiency SUVs, large vans and trucks in mini-motor pools around the state, and/or use commercial rental agreements by which SFM can rent specialty vehicles on an as-needed basis.

Recommended Greening Government Policies

Executive Directors and executive staff should lead by example and rotate four-wheel drive vehicles into an agency pool if he or she is currently assigned such a vehicle.

Executive Director approval of the purchase of four-wheel drive vehicles will also be reviewed and approved by the Governor’s Energy Office.

Prioritize replacement of pre-1996 light duty vehicles with a city fuel

efficiency rating of less than 25 miles per gallon.

The TEA workgroup recognizes that eliminating a pre-1996 vehicle from the fleet does not eliminate that vehicle’s environmental impact. The vehicle will most likely be sold and continue to operate in Colorado.

Action Plan

Identify and repair high-emitting fleet vehicles.

Continue the current replacement strategy whereby very old, low usage vehicles and pre-2000 vehicles traveling more than 7,000 miles per year are targeted for rotation within the fleet.



Image from Colorado State University

Acquire hybrid gas/electric high efficiency vehicles and other fuel efficient/low emission vehicles whenever practicable.

Improve the overall efficiency of acquiring, using, and maintaining fleet vehicles.

The Greening Government Coordinating Council (GGCC), in conjunction with the State Purchasing Office, will implement an Environmentally Preferable Purchasing (EPP) policy in 2008.

The policy will give preference to products that minimize environmental impacts over the lifetime of the product.

EPP is the purchase of products that have a lesser or reduced effect on human health and the environment when compared to competing products that serve the same purpose.

GGCC and members of SFM will develop EPP specifications for state fleet vehicles for inclusion in the policy.

The Energy Policy Act (EPACT) State and Alternative Fuel Provider Rule requires certain fleets to acquire alternative fuel vehicles (AFVs). Compliance is required by state government fleets that operate, lease, or control 50 or more light-duty vehicles (less than 8,500 lb gross vehicle weight rating) within the United States. Colorado's state fleet is subject to EPACT requirements.

EPACT requires that 75 percent of state fleet light duty vehicles purchased be alternative fuel (flex fuel, compressed natural gas, electric, etc.) vehicles.

EPACT's intent is to reduce the country's dependence on foreign oil. The EPACT requirements limit the number of hybrid gas-electric vehicles the state is allowed to purchase.

Action Plan

Form a stakeholder group to review and evaluate the entire fleet purchasing process. The stakeholder group will provide a report to the GGCC with recommendations to increase the variety of vehicle bids received; improve the process by which vehicle types are identified when offering replacement vehicles to departments and agencies; implement cooperative fleet purchasing agreements among the state fleets of the western states contracting alliance; and other recommendations to improve the efficiency of the procurement process and acquire vehicles that are environmentally preferable, meet programmatic needs, and are cost effective to maintain and operate.

Evaluate the fuel efficiency of the state-awarded 2008 vehicle types to ensure compliance with SB06-015, which requires vehicles purchased by the state meet or exceed the average fuel efficiency standards of the EPACT.

The Governor's Energy Office will determine if it is in the best interests of the state to submit a request for a waiver of the EPACT alternate fuel vehicle requirements to the Department of Energy.

