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Final Report**



GREENING GOVERNMENT RESEARCH AND IMPLEMENTATION PROJECT – PHASE I

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December 2007

**COLORADO DEPARTMENT OF TRANSPORTATION
RESEARCH BRANCH**

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16. Abstract <p>The Greening Government Research Project is Phase 1 of a two-phased research approach to identify how CDOT can achieve the goals and objectives mandated in Governor Ritter's recently signed executive orders on greening state government. The term "greening" means reducing negative environmental impacts through conservation of energy, water, waste, and other natural resources using a variety of measures. This report recommends preliminary actions CDOT can implement to begin greening the government in support of recent requirements and previously enacted state agency requirements. This report also identifies additional research to be performed as Phase 2 of the Greening Government Research and Implementation Project.</p> <p>Implementation:</p> <p>To begin implementing this greening government research, CDOT should form a CDOT Greening Government Steering Committee consisting of members from a variety of CDOT divisions. The committee should review the results of this research, specifically the tables that recommend green actions to be implemented. The committee can then determine which recommended green actions have the greatest benefit and will be implemented based on the following: budget, resources, regulatory requirements, degree of control, and environmental and economic benefits received.</p>			
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GREENING GOVERNMENT RESEARCH PROJECT

Report No. 2007-8

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EXECUTIVE SUMMARY

The Greening Government Research and Implementation Project was developed to provide an approach and pre-implementation plan for the Colorado Department of Transportation (CDOT) to follow in order to start implementing green actions. The term “greening” is defined as reducing negative environmental impacts through conservation of energy, water, waste, and other natural resources using a variety of measures.

Green actions need to be implemented in order to achieve specific environmental goals and objectives that are defined in Colorado Executive Orders D0011 07: Greening of Government: Goals and Implementations, and D0012 07: Greening of Government: Detailed Implementation. These orders were signed by Governor Ritter in April 2007. The purpose of these executive orders is to reinforce previous greening government executive orders enacted by Governor Owens and to direct state agencies and departments to meet specific and measurable goals and objectives to reduce the overall negative environmental impacts of state government.

This research project constitutes Phase 1 of a two-phased research approach. The purpose of Phase 1 is to uncover potential green actions CDOT can start to implement towards achieving Governor Ritter’s executive orders. Phase 1 of the research was limited to Property Management and six CDOT divisions within Headquarters. Phase 1 includes recommendations for specific green actions that can be implemented within the specific CDOT divisions researched, as well as areas that will need additional research for Phase 2 of the project. Phase 2 of this research project will focus on expanding the Phase 1 pre-implementation plans into a Phase 2 statewide CDOT Greening Government Implementation Plan (Plan). The Plan will recommend specific green actions that, if implemented, can help CDOT achieve the specific goals and objectives in the greening government executive orders.

Research for this project included internet research on executive orders, senate bills, and acts that prescribe green requirements for Colorado state agencies to implement. Research also included guidance documents available on state websites, association websites, and greening government websites. Informal interviews were performed with employees from the seven CDOT divisions

researched in order to understand and identify some of the activities and processes that relate to the requirements in the greening government executive orders.

The results from the research went beyond initial expectations. The initial expectation was that research would identify how the requirements of the greening government executive orders enacted by Governor Ritter relate to the activities of CDOT Headquarters and Property Management. Furthermore, research would identify actions that have been implemented by other transportation departments and state agencies, and recommend additional actions for CDOT to implement. The research met these expectations. The research then was expanded to include additional requirements referenced in Governor Ritter's executive orders as well as others previously enacted that relate to greening government in Colorado.

CDOT is required to develop an implementation plan ("plan") for submittal to the Greening Council. The plan needs to specify the actions CDOT will take in an effort to achieve Governor Ritter's greening government directives. This report provides a variety of recommended green actions for CDOT to consider and adopt into a statewide CDOT Implementation Plan. The format of the CDOT plan follows the recommended template provided by the Greening Council.

To start utilizing the results of this research and comply with the terms of Governor Ritter's executive orders, CDOT needs to: designate an energy management liaison and Greening Council representative; form a CDOT Greening Government Steering Committee; have the committee meet, review the report and its findings; and determine what recommended green actions will be implemented. CDOT also needs to compile fiscal year 2005 – 2006 baseline information and 2006-2007 information for water consumption, energy consumption, paper use, waste generation, and petroleum consumption by agency vehicles. Finally, CDOT should implement a system to track future consumption data.

Phase 1 of this project identified additional research to be performed during Phase 2 of the Greening Government Research Project. Recommended Phase 2 research includes additional research on and informal interviews with other state agencies, additional CDOT divisions, CDOT Steering Committee, Executive Management, and various roles across CDOT Regions 1

through 6, as they relate to implementing the goals and objectives defined in the greening government executive orders.

Implementation Statement

It is recommended that CDOT form a CDOT Greening Government Steering Committee consisting of members from a variety of CDOT divisions. The committee should, at a minimum, consider representation from the following CDOT divisions: Property Management, Facilities Management, Purchasing / Procurement, Human Resources, Public Relations, Information Technology, Planning, Environmental, Research, Maintenance and Operations, and Executive Management. The committee should review the results of this research, specifically the tables that recommend green actions to be implemented. The committee can then determine which recommended green actions have the greatest benefit and will be implemented based on the following: budget, resources, regulatory requirements, degree of control, and environmental and economic benefits received.

Other state agencies and departments may also benefit from reviewing this greening government research. Governor Ritter's greening government executive orders apply to all state departments, agencies, and offices. Therefore, the concepts inherent in the recommended green action tables in this report could be applicable to multiple state government departments, agencies, and offices across Colorado.

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1.0 INTRODUCTION

1.1 Background

This Greening Government Research and Implementation Project (Project) recommends potential actions that the Colorado Department of Transportation (CDOT) can implement to green CDOT. The term “greening” is defined as reducing negative environmental impacts through conservation of energy, water, waste, and other natural resources using a variety of measures. The recommendations to green CDOT follow the Greening State Government Executive Orders (EO) signed by Governor Ritter on April 16, 2007. The recommendations to green CDOT also support state guidance documents and existing requirements currently in place for state government in Colorado.

This Project serves as Phase 1 of a two-phased research project. Phase 1 is intended to provide preliminary guidance for CDOT, recommend initial actions to begin the greening process, and identify additional research for Phase 2 of the Greening Government Research Project.

The main scope of the Project is to research and develop an approach and pre-implementation plan for CDOT to follow. The green actions follow specific environmental goals and objectives defined in **Appendix A**, EO D0011 07 - Greening of State Government: Goals and Objectives:

- Reduce energy consumption by 20%
- Reduce water consumption by 10%
- Cut use of paper products by 20%
- Cut use of petroleum products in state vehicles by 25%
- Adopt a goal of zero waste
- Purchase more environmentally friendly products

The Project scope expanded to include research of additional state requirements that were referenced in EO D0011 07 mentioned above and EO D0012 07 - Greening of State Government: Detailed Implementation, included as **Appendix B**. (10, 11). The Project also included identifying various other greening state government requirements in Colorado as listed in **Table A**.

Table A. Greening Government Requirements in Colorado

Initiative or Requirement	Summary of Green Requirements
Act 24-103-207	All state agencies are required that 50% of their paper purchases have at least a 30% recycled paper content. (4)
EO D 014 03 Governor Owens (7/16/03)	Requires all State agencies to initiate energy performance contracts where opportunity exists to better utilize budgets; feasibility study should be submitted to the Department of Personnel and Administration by July 04. (8)
EO D 005 05 Governor Owens (5/15/05)	To the extent applicable and practicable, requires state agencies to adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction. (9)
Senate Bill 06-016 (2006)	Alternative Fuel Use Requirement: By January 1, 2007, the Department of Personnel must adopt a policy that requires all state-owned diesel vehicles and equipment to be fueled with a fuel blend of 20% biodiesel and 80% petroleum diesel (B20), subject to the availability of the fuel and so long as the price is no greater than \$0.10 more per gallon than the price of conventional diesel; By July 10, 2010, adopt a policy requiring that at least 10% of all state-owned bi-fuel vehicles be fueled exclusively with an alternative fuel. (6)
Senate Joint Resolution SJR 06- 032 (2006)	The General Assembly supports the use of LEED as a design and construction guideline for public and private facilities and urges the state of Colorado and its agencies and departments to design and construct facilities to achieve LEED silver certification. (5)
Senate Bill 07-051 (4/16/07)	High Performance State Buildings: Requires any new or renovated building whose total project cost includes 25 percent or more in state funds to be designed and built to a high performance green building standard; requires third party certification to a green standard such as LEED and that increased initial costs are regained through decreased operational costs within 15 years. (7)
EO D0011 07 (4/16/07) Governor Ritter	Greening of Government: Goals and Implementation. By 2012, State agencies are required to reduce energy consumption by 20 percent at all state facilities, cut paper use by 20 percent, cut water use by 10 percent and cut petroleum use by 25 percent in state vehicles; by 12/1/07, state agencies are required to complete a transportation efficiency audit addressing methods for improving the environmental efficiency of the state fleet; elements of D 005 05 remain in place and are to be read in conjunction with this Executive Order. (10)
EO D0012 07 (4/16/07) Governor Ritter	Greening of Government: Detailed Implementation; reiterates performance contracting from EO 014 03; where performance contracting is not feasible, state agencies must reduce energy consumption by 10% from 2005-06 fiscal baseline; requires agencies to develop and implement materials management, purchasing, and resource management policies; requires working with the Greening Council to adopt a goal of “zero waste”; requires following a DPA / DPHE

Initiative or Requirement	Summary of Green Requirements
	<p>purchasing policy that will include the purchase of products to consider recycled content, toxicity, and impact on air and water resources; energy star; requires that electronic equipment purchases consider life-cycle and energy impacts; requires the Greening Council to develop standards for the leasing of state buildings that will address water, energy, recycling, and access to public transportation; requires restrictions in purchase of 4WD, replacement of pre-1996 light duty trucks that get <25 miles to the gallon, and annual reporting to Greening Council on petroleum reduction; requires use (when available) of a minimum of 20% bio-diesel blend for diesel vehicles, fueling flex vehicles with alternative fuels 50% of the time.; requires each state agency to designate an Energy Management Liaison; elements of D 005 05 remain in place and are to be read in conjunction with this Executive Order. (11)</p>
<p>Energy Policy Act: State & Alternative Fuel Provider Rule - EPAct 507 (1996)</p>	<p>For state agencies that have more than 50 light-duty vehicles (LDV) (excluding emergency vehicles, law enforcement, vehicles parked at personal residences) and 20 of them are primarily used in metropolitan areas and those 20 vehicles are centrally fueled or capable of being centrally fueled, those agencies are required to comply with the Alternative Fueled Vehicle Acquisition Mandate; states are required to purchase an increasing amount of Alternatively Fueled Vehicles (AFV) starting in 1996. The following is the required schedule of AFV purchases as a percentage of total new LDV purchases by State fleets: 10 percent for model year (MY) 1996, 15 percent for MY 1997, 25 percent for MY 1998, 50 percent for MY 1999, and 75 percent for MY 2000 and beyond. (14)</p>

In addition to considering the greening requirements in place for state government, the research also included information from the State of Colorado Greening Government Planning and Implementation Guide (Guide), included as **Appendix C**. The Guide is a focal point of research due to its relevance to the greening government executive orders signed by Governor Ritter. The Guide focuses on five topics that impact the environment and suggests specific strategies and green actions that government agencies should take, where appropriate, to achieve environmental improvements. (13) The recommendations from the Guide have been incorporated into the recommendations of this Project. **Table B** lists the five topics included in the Guide and relates those topics to the specific requirements of the greening government executive orders.

Table B. Environmental Topics from the Guide and How Those Topics Align with the Requirements from the Greening Government Executive Orders

Environmental Topics	Executive Order Requirement to be achieved by 2012
Energy Efficiency	Reduce energy consumption by 20%
Water Conservation and Quality	Reduce water consumption by 10%
Waste Reduction and Recycling	Cut use of paper products by 20%; adopt a goal of zero waste
Environmentally Preferable Purchasing	Purchase more environmentally friendly products
Transportation	Cut use of petroleum products in state vehicles by 25%

The Guide also provides step-by-step guidance to help departments and agencies initiate and implement internal greening government actions. A Greening Government Plan template is included in the Guide to assist state government agencies and departments with the greening government implementation process. State agencies and departments are required to develop their own Greening Government Implementation Plan (Implementation Plan) for submittal to the Colorado Greening Government Coordinating Council (Greening Council) that was formed pursuant to Executive Order D 005 05, included as **Appendix D**. (13). The Implementation Plan should include the green actions CDOT intends to implement to achieve the goals and objectives in the greening government executive orders. CDOT will be responsible for reviewing and updating the information in the Implementation Plan each year for re-submittal to the Greening Council and will not have to develop a new plan each year unless major changes have occurred. (13) CDOT Research has followed the template in the Guide and has prepared two pre-implementation plans for the CDOT operations researched in this Project, included as Appendices E and F.

In addition to the Guide, research also included information from the Association of State Highway Transportation Officials (AASHTO) Center for Environmental Excellence website. The AASHTO website has posted case studies from nine state transportation departments to demonstrate some specific elements of Environmental Management Systems (EMSs) that have been implemented within the departments. (2) The case studies were selected as a focal point of research because they summarize environmental efforts implemented by nine other state transportation departments. The research obtained from the AASHTO website focuses

specifically on the environmental topics from **Table B** and can be read about in more detail in **Appendix G. Table C** identifies whether or not green actions have been implemented by the following state transportation departments and reported on the AASHTO website:

- Texas Department of Transportation (TxDOT);
- Florida Department of Transportation (FDOT);
- Maryland State Highway Administration (MDSHA);
- Washington Department of Transportation (WSDOT);
- New York State Department of Transportation (NYSDOT);
- Maine Department of Transportation (MDOT);
- New Hampshire Department of Transportation (NHDOT);
- Massachusetts Highway Department (Mass Highway); and,
- Pennsylvania Department of Transportation (PENNDOT)

Table C. Summary of Green Actions Implemented by State Transportation Departments

State Department	Energy Efficiency	Water Conservation and Quality	Waste Reduction and Recycling	Environmentally Preferable Purchasing	Transportation
TxDOT	none	X	X	none	none
FDOT	none	none	X	none	none
MDSHA	none	X	X	none	none
WSDOT	none	X	X	none	none
NYSDOT	X	X	X	X	X
MDOT	none	X	none	none	none
NHDOT	none	X	X	none	none
Mass Highway	none	X	X	none	none
PENNDOT	none	X	X	none	none
CDOT*	X	X	X	none	X
<p>* CDOT was not represented through a case study on the AASHTO Center for Environmental Excellence website. Information was obtained directly from CDOT. X means green actions have been implemented (1)</p>					

In addition to above research, two CDOT operations were also selected to visit and conduct informal interviews as part of the Project. The purpose of the operation visits was to gain a better understanding of the potential areas within CDOT’s operations that provide opportunities to green CDOT. The two operations selected were Headquarters and Property Management. Headquarters operation visits included research on energy efficiency, water conservation and quality, waste reduction and recycling, environmental preferable purchasing, and employee transportation. The primary focus of the Property Management research included buildings, management of properties, and what support Property Management can use.

CDOT Headquarters was selected for Phase I research due to its size, variety of uses, employee supportiveness, and its influence on other regional offices to lead by example. The focus of the Headquarters visit was to gain a better understanding of CDOT activities and processes as they relate to the greening government requirements. Since the scope of the executive orders is broad and the requirements affect divisions across CDOT’s operations, the Headquarters visit was divided into multiple informal meetings with the following divisions:

- Fleet Vehicles
- Purchasing / Procurement
- Facilities Management
- Print Shop
- Information Technology
- Planning

Property Management was selected as a second focus Phase I area due to the significant environmental impacts resulting from Property Management's oversight of buildings, including design, construction, leasing, maintenance, operation and renting. The research identified practices to satisfy requirements of the applicable Leadership in Energy and Environmental Design (LEED) rating system, the rating system developed by the US Green Building Council (USGBC) which measures the sustainability of buildings. More information about LEED and the impacts of buildings can be found in the Property Management Pre-Implementation Plan in **Appendix F**. Furthermore, the research identified how activities of Property Management relate to the requirements of the executive orders.

The Headquarters and Property Management research had three primary objectives. The first objective was to understand the individual processes and activities that occur within each CDOT division. By understanding these processes and activities, staff can assess areas for improvement and greening actions to consider. The second objective is to identify what green actions have already been implemented. Some CDOT divisions already are implementing some green actions that other CDOT divisions can adopt and implement to meet the goals of the executive orders. The final objective of the research is to identify additional research that should be incorporated into the scope of Phase 2 of this Project.

2.0 CONCLUSIONS AND RECOMMENDATIONS

2.1 Conclusions

Per Executive Order D 005 05, A Greening Council has been formed to promote environmentally sustainable and economically efficient practices in accordance with the goals of the Executive Order. As stated in the Executive Order, the Greening Council has been given the responsibility to, “develop, implement, and augment programs, plans and policies that save money, prevent pollution, and conserve natural resources throughout state government management and operations, including but not limited to source and waste reduction, energy efficiency, water conservation, recycling, fleet operations, environmental preferable purchasing, and establishing state-wide goals to save taxpayers’ money and reduce environmental impacts.”

(9)

The Greening Council consists of Angie Fyfe from the Governor’s Energy Office serving as the Greening Government Manager and an administrative team. The administrative team consists of the following individuals and their respective state agencies: Patrick Hamel from the Colorado Department of Public Health and Environment (CDPHE), Susan Castellon from the Governor’s Energy Office, and Richard Lee from the Colorado Department of Personnel and Administration.

The most recent Greening Council meeting took place in July of 2007. Prior to the meeting, the Executive Directors of State Agencies were sent an invitation to the meeting and asked to appoint an representative from within their agency to participate in the Greening Council meeting. Past meetings have involved CDOT participation from Brad Beckham, Environmental Programs Manager, and Patricia Martinek, Environmental and Planning Research Manager in CDOT’s Division of Transportation Development (DTD). At the Council meeting in July, 2007, Del Walker represented CDOT at the Council. Mr. Walker is CDOT’s Director of Staff Branches. The next Council meeting will probably occur in early 2008.

Both CDOT Headquarters and Property Management have already implemented some green actions within their respective divisions. These actions contribute to the overall goals and objectives in the recent executive orders. **Table D** identifies green actions implemented by

Headquarters and Property Management that were researched as part of Phase 1 of this Project. The table identifies the green actions implemented by the following CDOT divisions:

- Facilities Management
- Fleet Vehicles
- Information Technology
- Planning
- Print Shop
- Purchasing / Procurement
- Property Management

The column on the right identifies which greening government requirements from **Table A** are partially satisfied. For detailed information about the environmental impacts of CDOT Headquarters and Property Management, please refer to section 1.2 in the respective pre-implementation plans found in **Appendices E and F**. These appendices are written in a lift-out stand-alone format for use by each of the two respective divisions.

Table D. Green Actions Implemented by CDOT Divisions

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
Facilities Management				
1	Facilities Management	Facilities Management is currently working on an RFP for Energy Performance Contracting to take place; they will look at older systems such as the electrical equipment in the Eisenhower Tunnel to replace with more efficient systems.	The energy performance contracting will identify areas for energy conservation. If changes are implemented, CDOT will save money without upfront cost to fund the projects.	EO D014 03 – initiate energy performance contracts; EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
2	Facilities Management	Installed a flat plate mechanical system.	Reduces energy consumption, eliminated need to run the cooler	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
3	Facilities Management	Upgraded the irrigation system to run off of well water and wireless zones on timers	Replaced consumption of some city water with well water; made system more energy and water efficient	EO D0011 & EO D0012 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
4	Facilities Management	Upgraded the lights at Headquarters with energy star fixtures that utilize compact fluorescent bulbs.	Reduces energy consumption; reduces waste generated by more frequent disposal of bulbs with a shorter life cycle	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
5	Facilities Management	Replaced some of the toilets with newer low-flow toilets.	Reduces water consumption	EO D0011 & EO D0012 – Reduce water consumption by 10% by 2012.
6	Facilities Management	Trained employees in Facilities Management to turn off sprinklers on days when rain is expected	Prevents water use when water is not needed; reduces consumption	EO D0011 & EO D0012 – Reduce water consumption by 10% by 2012.
7	Facilities Management	Cleaning staff utilizes only green products.	Environmental Preferable Purchasing; protects health and safety of employees who come in contact with cleaning products	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
8	Facilities Management	Re-roofing with a new energy efficient membrane.	Reduces energy consumption of building	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
9	Facilities Management	Utilizes recycled cubicle walls when furnishing buildings.	Reduces the demand on virgin materials; re-use prevents these items from entering landfills as trash.	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
10	Facilities Management	Arranged a deal with Hewlett Packard to remove old monitors when new monitors are purchased.	Eliminates need to dispose of universal waste; saves money and time	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
11	Facilities Management	Implemented an energy management system so computers can control room temperatures.	Reduces energy consumption	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
Fleet Vehicles				
12	Fleet Vehicles - Region 5, Alamosa	Alamosa is starting to run biodiesel in their equipment	Replaces petroleum consumption with a renewable fuel source	EO D0011 & EO D0012 – Environmental Preferable Products
13	Fleet Vehicles	Changed to synthetic gear oil for use in transmissions.	Reduces draining requirements from once every year to once every 3 years; reduces amount of oil purchased; reduces amount of waste generated; reduces cost from purchase and disposal	EO D0011 & EO D0012 – Environmental Preferable Products
14	Fleet Vehicles	Maintenance schedules for vehicles and equipment are starting to be tracked in SAP. SAP sends a reminder when maintenance needs to be performed.	Regular maintenance of vehicles extends the life of the vehicle; reduces overall maintenance of vehicle	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
15	Fleet Vehicles - Alamosa	Alamosa is purchasing 90% recycled antifreeze.	Environmental Preferable Purchasing; encourages recycling over disposal; minimizes waste generation	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
16	Fleet Vehicles - various maintenance shops	Installed aqueous cleaners to replace solvent-based cleaners.	Eliminated hazardous solvent; reduced the amount of hazardous waste generated	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
17	Fleet Vehicles - various maintenance shops	Some shops are utilizing Jiffy recycled engine oil.	Environmental Preferable Purchasing; reduces reliance on virgin oil; encourages re-use of products	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
18	Fleet vehicles – Durango, Pueblo, Alamosa	Some shops are recapping tires for re-use.	Environmental Preferable Purchasing; reduces waste generated; encourages re-use of products	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
19	Fleet Vehicles - Alamosa	Shops in Alamosa are burning used oil in space heaters for heat.	Reduces energy required to heat building; prevents used oil from becoming a waste by re-using it as a fuel; reduces cost associated with used oil disposal	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
20	Fleet Vehicles – Alamosa and most main shops	Most shops drain, crush, and recycle their used oil filters.	Reduces waste going to the landfill; encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
21	Fleet Vehicles - various maintenance shops	Some shops utilize recycled water for power washing of vehicles or equipment.	Reduces water consumption; encourages re-use of water	EO D0011 & EO D0012 – Reduce water consumption by 10%; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
Information Technology				
22	Information Technology	Provides a recommended product list to CDOT divisions for monitors and desktop printers. All recommended products are EnergyStar.	Reduces energy consumption; Environmentally Preferable Purchasing	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
23	Information Technology	Recommends monitors be set to sleep mode after 30 minutes of inactivity.	Reduces energy consumption	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012
24	Information Technology	Provides access to work email through VPN which allows employees to work from home.	Reduces commuter petroleum consumption and air pollution by CDOT employees	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
25	Information Technology	All black and white network printers are programmed to print double-sided.	Reduces paper consumption and waste generated.	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
26	Information Technology	All toner cartridges are recycled.	Reduces waste going to the landfill, encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
27	Information Technology	Purchases paper with recycled content for all Headquarters network printers.	Environmentally Preferable Purchasing	EO D0011 & EO D0012 - Environmental Preferable Products; Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content
28	Information Technology	Recycles cell phones within the Information Technology Division and accepts cell phones from other divisions for recycling.	Reduces waste going to the landfill, encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities
29	Information Technology	Recycles batteries through Battery Plus. Uses refurbished batteries.	Reduces waste going to the landfill, encourages reusing and supports environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
30	Information Technology	Installed software that can reroute calls which allows employees handling the Help Desk to work from home.	Reduces commuter petroleum consumption and air pollution by CDOT employees	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
31	Information Technology	Implementing videoconferencing in Fiscal Year 2008.	Reduces commuter petroleum consumption and air pollution by CDOT employees, improves employee efficiency and safety from reduced driving	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
Planning				
32	Planning	CDOT is currently using two federal grants: Safe Routes to School (to make it easier for kids to walk or bike to school) and Congestion Mitigation/Air Quality (offering transportation alternatives in areas with congestion and air quality concerns).	Reduces petroleum use, reduces air pollution, encourages employee health and safety	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
33	Planning	Promote bicycle/pedestrian friendly designs in workshops. Encourage individuals in each Region to volunteer to help ensure bicycle racks and facilities are available.	Reduces petroleum use, reduces air pollution, encourages employee health and safety	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
34	Planning	Provide commuter checks to employees who bicycle, walk, and take public transportation to work and meetings.	Reduces petroleum use, reduces air pollution, encourages employee health and safety, rewards employee behavior	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
35	Planning	Promotes “Bike to Work Month.” and have a shed for bicycle storage.	Reduces petroleum use, reduces air pollution, encourages employee health and safety	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
Print Shop				
36	Print Shop	The print shop currently recycles ink cartridges, toner, and paper.	Reduces waste generated; encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
37	Print Shop	The Print Shop currently utilizes a vendor to launder rags.	Reduces waste generated; supports re-use; environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
38	Print Shop	The Print Shop utilizes water-soluble inks and solvents.	Eliminated hazardous waste generation; environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
39	Print Shop	The Print Shop eliminated its old pre-press machine and currently recycles the metal plates used for the new press.	Reduces waste generated; encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
40	Print Shop	The Print Shop eliminated hazardous chemicals associated with the print process.	Eliminated hazardous waste generation; protects employee health and safety; supports environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
Purchasing / Procurement				
41	Purchasing / Procurement	Purchasing / Procurement has worked out a deal with 3 of the 6 office supply vendors to provide a 1% discount on the purchase of green products.	Environmentally preferable purchasing; encourages use of recycled products	EO D0011 & EO D0012 – Environmental Preferable Products
42	Purchasing / Procurement	Has worked with Property Management to include in bid specifications energy star light and heating fixtures and energy efficient insulation.	Environmentally preferable purchasing; reduces energy needed to cool, light, and heat the building throughout the building's life	EO D0011 & EO D0012 – Environmental Preferable Products; reduce energy consumption by 20% by 2012.

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
43	Purchasing / Procurement	CDOT participates in an office supply consortium consisting of multiple state agencies including CDPHE, Department of Labor and Employment, Department of Revenue, and the Department of Corrections.	Brings a louder voice and has a greater impact on environmentally preferable purchasing	EO D0011 & EO D0012 – Environmental Preferable Products
44	Purchasing / Procurement	Some staff members utilize double-sided printing.	Reduces paper consumption; reduces paper that will need to be recycled	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities
45	Purchasing / Procurement	Staff currently turns out lights and recycles pens.	Reduces energy consumption; reduces waste generated	EO D0011 & EO D0012 – EO Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; reduce energy consumption by 20% by 2012.
Property Management				
46	Property Management	Receives emails from State Buildings; attends annual LEED meetings amongst State agencies; receives emails from the American Institute of Architects (AIA) on greening initiatives	Increases knowledge about measures that can be incorporated into new and existing buildings to reduce the overall environmental footprint of the building and to increase sustainability.	EO D 005 05 - Adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction
47	Property Management	Have included in bid specifications energy star light and heating fixtures and energy efficient insulation for design build	Reduces energy consumption throughout the operation of the building; reduces maintenance needs by increasing life cycle of bulbs.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
48	Property Management	New and existing buildings utilize recycled cubicle walls when furnishing buildings, and carpet squares are installed which can be replaced just in high-wear areas	Reduces the demand on virgin materials; re-use prevents these items from entering landfills as trash.	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
49	Property Management	At the four buildings managed by Property Management, installed thermostat devices that only allow a 3 degree variance in temperature from the master thermostats, which are set up in zones	Reduces energy consumption needed to heat and cool buildings.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012
50	Property Management	At the four buildings managed by Property Management, arranged with cleaning contractors to always turn off lights after they leave a building	Reduces energy consumption needed to light buildings while unoccupied.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012
51	Property Management	Installed infrared heating tube system within maintenance buildings	Reduces energy consumption by replacing forced air heating; reduces amount of time needed for heating; increases efficiency.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
52	Property Management	Replaced light fixtures with energy star fixtures to replace use of incandescent bulbs with use of compact fluorescent T-8 light bulbs in some maintenance buildings	Uses 2/3 less energy; bulbs last longer; waste generation is reduced.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
53	Property Management	Replaced some garage doors with energy efficient windows in some maintenance buildings	Reduces the amount of air flow which increases energy efficiency for heating and cooling; reduces artificial light needed by adding natural light.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
54	Property Management	At 4670 Holly, installed carpets with recycled material content; low-emitting VOC carpets	Reduces the burden on virgin materials; reduces impact on employee health by improving air quality.	EO D 005 05 - Adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
55	Property Management	At 4670 Holly, installed energy management system for HVAC unit	Reduces energy consumption in building.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products

2.2 Recommendations

Many green actions have already been implemented by CDOT. However, additional actions are recommended to help meet the requirements of the executive orders. Some of these recommendations have been assigned high priority. Research recommends the following 6 highest priority areas for CDOT to focus its future efforts:

1. Designate an energy management liaison
2. Establish the CDOT Greening Government Steering Committee
3. Develop baseline information for FY 2005-2006
4. Compile consumption data for FY 2006-2007
5. Configure a performance indicator tracking system
6. Review research and determine initial green actions to be implemented

2.3 Designate an Energy Management Liaison

Executive Order D0012 07 requires that each agency and department designate an energy management liaison. Research recommends that CDOT appoint an energy management liaison as soon as possible. This position within CDOT will:

1. Work with the Governor’s Energy Office and be trained on the implementation of best energy management practices
2. Provide outreach, training, assistance, and guidance to and on behalf of CDOT staff
3. Coordinate and manage CDOT’s efforts in managing and tracking progress toward meeting greening government executive order requirements
4. Develop and implement a statewide CDOT Greening Government Implementation Plan as part of Phase 2 of this Project
5. Review and provide annual updates to the Plan as required for submittal to the Greening Council

6. Serve as CDOT's representative on the Greening Council
7. Serve as facilitator to the CDOT Greening Steering Committee, and
8. Compile the annual CDOT Greening inventory to the Governor.

2.4 Meet as the CDOT Greening Government Steering Committee

Research recommends that CDOT arrange the first meeting of the CDOT Greening Government Steering Committee and schedule future meeting dates. The efforts of this committee will represent CDOT's efforts toward greening government and will be summarized to the Greening Council by CDOT's Energy Management Liaison. To date, Research has identified the following CDOT employees to participate in the CDOT Greening Government Steering Committee:

- Patricia Martinek, Environmental and Planning Research Manager
- Brad Beckham, Environmental Programs Manager
- Del Walker, Director of Staff Branches
- Cheryl Wright, Procurement Services Manager
- Johnny Olson, Maintenance and Operations Superintendent
- Joe Mahoney, Facilities Management

Because of the agency-wide scope and resource commitments needed for the success of this effort, it is recommended that CDOT include director-level Executive Management in the Greening Government Steering Committee. Since the scope of the greening government executive orders spans across multiple areas of CDOT, it is also recommended that additional divisions and offices be incorporated into the committee for representation. The following staff areas can reinforce the goals and success of the CDOT Greening Government Steering Committee:

- Executive Management
- Human Resources
- Public Relations
- Information Technology (IT)
- Planning and Environmental

2.5 Develop Baseline Information for Fiscal Year 2005-2006

Executive Order D0011 07 mandates specific goals and objectives for state departments and agencies to reach by 2012. These objectives and goals use metrics from fiscal year 2005-2006 as the baseline data. Specific improvement goals include the areas of: energy consumption; paper use; water consumption; and petroleum consumption by state vehicles excluding vehicles used for law enforcement, emergency response, road maintenance, and highway construction.

Research recommends that CDOT compile baseline data for fiscal year 2005-2006 in these focus areas.

2.6 Compile Consumption Data for Fiscal Year 2006-2007

Research also recommends that CDOT compile baseline data for fiscal year 2006-2007 to represent energy consumption, paper use, water consumption, and petroleum consumption by state vehicles by CDOT this past year. These data will be needed for the annual inventory due to the Governor in the fall of 2007.

2.7 Configure a Performance Indicator Tracking System

Research recommends that CDOT work with Information Technology and appropriate CDOT divisions to determine if the current SAP system has the potential to track performance indicators relating to the areas of improvement in the executive orders. If SAP does not have the potential to track performance indicators as needed, research recommends that CDOT purchase and operate environmental performance tracking software that can do so. Performance indicators are needed to show improvement in the areas specified by the greening government executive orders. Research also recommends that CDOT select which of the following performance tracking indicators to use to track progress in each improvement area for incorporation into the performance tracking software:

1. Energy Efficiency

- Kilowatt-hours (kwh) of electricity consumed
- Therms of natural gas consumed
- Replacement of energy consuming fixtures

- Energy savings achieved
- Energy conservation projects implemented
- Energy consumption per employee

2. *Water Conservation*

- Gallons of city water consumed
- Gallons of well water consumed
- Replacement of water conserving fixtures
- Water savings achieved
- Water conservation projects implemented
- Water consumption per employee

3. *Waste Reduction and Recycling*

- Types and quantities in pounds of materials recycled
- Types and quantities in pounds of waste produced
- Recycling and waste reduction projects implemented
- Instances of hazardous waste eliminated
- Waste reduction savings
- Waste generation and/or recycling quantity per employee

4. *Environmentally Preferable Purchasing (EPP)*

- Number of contracts incorporating green requirements
- Amount of paper purchased with 30% recycled product
- Number of green products purchased
- EPP projects implemented

5. *Transportation*

- Gallons of gasoline consumed
- Gallons of diesel consumed
- Gallons of biodiesel consumed

- Gallons of E-85 consumed
- Number of hybrid or flex fuel vehicles in the vehicle fleet
- Reduction in petroleum products
- Vehicle miles traveled
- Vehicle miles not traveled due to alternative transportation
- Petroleum use reduction projects implemented

2.8 Review Research and Determine Which Green Actions Will Be Implemented

Research recommends that CDOT review the recommendations in the Headquarters pre-Implementation Plan (**Appendix E**) and the Property Management Pre-Implementation Plan (**Appendix F**) to determine which actions can be implemented in an effort to meet the goals of the executive orders. These recommendations should be reviewed by the CDOT Greening Government Steering Committee and the applicable CDOT Divisions. In reviewing the recommendations, CDOT should determine the following, based on budget, resources, regulatory requirements, degree of control, and environmental and economic benefits received:

- Which actions will be implemented
- Additional actions that can be implemented
- Who in CDOT is responsible for implementing recommended actions
- Timeframe for action completions (short-term and long-term)

When determining which actions should be implemented, CDOT’s Greening Government Steering Committee should also consider the questions in **Table E** for each suggested action.

(13) Answers that have a “yes” answer to many or all of the questions should be given highest priorities in both long and short-term goals:

Table E. Use of Questions to Determine Which Green Actions Should Be Implemented by the Divisions Within CDOT Headquarters and by Property Management

Question	Yes	No
Will the action result in environmental / health benefits?		
Are the environmental benefits significant?		
Will the action result in a cost savings over the life of the product / action?		

Are the cost savings significant?		
Will the action support progress in one or more of the Implementation Guide priority areas (energy efficiency, water conservation and quality, waste reduction and recycling, environmental preferable purchasing, transportation)?		
Is the time frame and ease of implementation manageable given agency resources?		
Would this activity help to maintain compliance and meet regulatory requirements?		
Could the action reduce compliance obligations (reporting, fees, management costs)		
Is the issue of significant concern to employees, or those who use your services?		
Does the activity have a clear educational value or provide high visibility?		

After short and long-term actions have been identified for CDOT Headquarters to implement, the actions should be incorporated into a statewide CDOT Greening Government Implementation Plan. After such a Plan is developed for CDOT and approved by the CDOT Greening Government Steering Committee, it must be submitted to the Colorado Greening Government Coordinating Council (Greening Council). CDOT will be responsible for reviewing and updating the information in the Plan each year for re-submittal to the Greening Council and will not have to develop a new plan each year unless major changes to the previous year’s Plan have occurred. (13)

Table F describes the green actions and tasks associated with the six high priority recommendation areas discussed above. **Table G** describes recommendations that should be considered for implementation by CDOT divisions within Headquarters. **Table H** describes additional recommendations that should be considered for implementation by Property Management to help CDOT achieve the goals in the executive orders.

Table F. High Priority Recommended Green Actions and Tasks to Be Implemented

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
1	Implement Greening State Government Initiative	Obtain staff momentum and executive management support to implementing the requirements of the Executive Orders	Officially form the CDOT Greening Government Steering Committee. Include additional divisions and director-level executive management in the CDOT Greening Government Steering Committee. This will reinforce the ability of the CDOT Greening Government Steering Committee to implement the requirements of the executive orders. Consider including staff from Human Resources, Public Relations, Information Technology, Planning, and executive management positions, such as the Executive Director, Chief Engineer, and/or the Director of Transportation Development. Members of the CDOT Greening Committee should stay abreast of greening initiatives for their respective divisions.	Currently, the CDOT Greening Government Steering Committee includes the following staff: Patricia Martinek, Environmental Planning and Research; Brad Beckham, Environmental Programs Manager; Del Walker, Director of Staff Braches; Cheryl Wright, Procurement Services Manager; Johnny Olson, Maintenance and Operations; and Joe Mahoney, Facilities Management.	CDOT Greening Government Steering Committee, Executive Management, other CDOT divisions as needed	EO D0011 & D0012 07
2	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Develop a schedule for the CDOT Greening Government Steering Committee to meet. The meetings should take place at least once in between each Greening Council meeting.	The next Greening Council meeting is expected to take place in early 2008.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
3	Implement Greening State Government Initiative	Designate an energy management liaison	Designate an energy management liaison within CDOT. This person will be trained by the GEO regarding the implementation of best energy management practices. This person will be responsible for working with the Greening Council and the GEO on state renewable energy projects, and can serve other functions of the Greening initiative required of CDOT.	Each agency and department is directed in the Governor's EO to designate an energy management liaison.	CDOT Greening Government Steering Committee, Executive Management	D0012 07 – reduction of state energy consumption
4	Implement Greening State Government Initiative	Identify greening actions to be implemented	Review the Pre-Implementation Plan developed for CDOT Headquarters. Determine which green actions from Table D and E should be implemented within CDOT. Use the questions in Table C to determine which recommended green actions have the greatest benefit and should be implemented. Include those green actions in the statewide CDOT Implementation Plan that will be submitted to the Greening Council after completion.	Using Table C in the Plan, determine which green actions will be implemented, who is responsible for implementing each green action, and what timeframe for completion will be assigned. This exercise will help CDOT identify short-term and long-term actions.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07
5	Implement Greening State Government Initiative	Identify greening actions to be implemented	Review the Pre-Implementation Plan developed for CDOT Property Management. Determine which green actions from Table D should be implemented within CDOT. Use the questions in Table C to determine which recommended green actions have the greatest benefit and should be implemented.	Using Table C in the Plan, determine which green actions will be implemented, who is responsible for implementing each green action, and what timeframe for completion will be assigned. This	CDOT Greening Government Steering Committee, Property Management	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Include those green actions in the statewide CDOT Implementation Plan that will be submitted to the Greening Council after completion.	exercise will help CDOT identify short-term and long-term actions.		
6	Implement Greening State Government Initiative	Identify greening actions to be implemented	Review Table B in the Property Management Plan and the Headquarters Plan which summarizes the green actions implemented by certain CDOT divisions or locations. Determine if those green actions could be implemented within other divisions of CDOT.	Table B of both pre-implementation plans highlights actions that have been implemented, and perhaps some of these best practices can be shared throughout CDOT statewide.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07
7	Implement Greening State Government Initiative	Implement a system to track all the requirements of the executive orders	Work with Information Technology and other CDOT divisions to understand the functions of the different SAP modules. The areas to look at that could potentially relate to implementing the executive orders include: Materials Management, Human Resources, Plant Maintenance, Real Estate, Sales and Distribution, Learning Solutions, Business Data Warehouse. Identify reporting capabilities and whether or not SAP reports queries need to be developed. Identify what data from within the SAP system needs to be included in the reports. Determine if the SAP reporting capabilities will work to track the requirements of the executive orders or if a different system would work better.	The CDPHE will have a database that tracks the progress of all state agencies in reaching the requirements of the executive orders. Information will need to be reported up to the CDPHE via the Greening Council on an annual basis.	CDOT Greening Government Steering Committee, Information Technology, other CDOT divisions as needed, division heads responsible for SAP training on specific modules	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Base the decision on needs, cost, budget, training time, etc.			
8	Petroleum Fuel Consumption	Compile baseline information for fiscal year 2005-2006	Compile a baseline in gallons for petroleum consumed in State-managed vehicles for fiscal year 2005-2006. Exclude vehicles for law enforcement, road maintenance, and highway construction from this baseline data.	SAP was not implemented at this time, so this information may be present in software or tracking method in place prior to SAP. Or this information may be obtained from accounts payable.	CDOT Greening Government Steering Committee, Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
9	Petroleum Fuel Consumption	Compile 2006 – 2007 consumption data	Compile consumption data for gallons of petroleum consumed for non-exempt State managed vehicles for fiscal year 2006-2007 (excludes vehicles for law enforcement, road maintenance, and highway construction).	Since SAP is not fully implemented, CDOT may need to utilize the same method of data collection when determining 2005-2006 baseline data.	Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
10	Water and Energy Conservation	Compile baseline data for 2005-2006 water and energy consumption	Work with Facilities Management and Property Management to compile baseline data for 2005-2006 water and energy consumption for CDOT-owned and controlled facilities.	Joe Mahoney in Facilities Management has information on consumption at Headquarters. Johnny Olson may have this information for maintenance and other CDOT-owned buildings.	CDOT Greening Government Steering Committee, Facilities Management, Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
11	Water and Energy Conservation	Compile consumption data for 2006-2007 water and energy consumption	Work with Facilities Management and Property Management to develop a uniform system to make sure water and energy consumption for all CDOT-owned buildings are being tracked accurately. Currently, tracking of energy and	Joe Mahoney in Facilities Management maintains records on consumption at Headquarters. He stated that Johnny Olson should have this information for	CDOT Greening Government Steering Committee, Facilities Management, Property	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			water consumption is taking place within Property Management and Facilities Management. Ensure these numbers are being combined for accurate consumption reporting for 2006-2007 data.	maintenance and other CDOT-owned buildings. Leased buildings would require separate records collection.	Management	20% by 2012.
12	Paper Consumption	Compile baseline data for 2005-2006 paper consumption baseline and 2006-2007 paper consumption data.	Determine how much paper was consumed for fiscal year 2005-2006 (both paper without recycled content and paper with more than 30% recycled content).	Each division is responsible for purchasing their own paper when less than \$5000 is being spent. This information may be easier to compile by contacting the approved vendors used by each division.	CDOT Greening Government Steering Committee, all CDOT divisions	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
13	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Review the August 2006 State of Colorado Greening Government Status Report. Determine what statements reported in the status report still need to be implemented or reinstated.	Some actions that CDOT reported in the August 2006 status report have not yet been implemented or are no longer being implemented.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07

Table G. Recommended Green Actions and Tasks to Be Implemented by CDOT Divisions within Headquarters

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
1	Implement Greening State Government Initiative	Give some incentives to implementing the requirements of the Executive Orders	Work with Human Resources to determine what, if any, additional incentives can be offered to CDOT employees who go out of their way to make an effort towards meeting the requirements of the greening government executive orders. Consider adding employee IPOs in areas of greening actions.	Some ideas discussed include extra time in the morning to shower if an employee bikes to work. Other options could include special flexibility with flex time hours, achievement awards, and/or a Greening awards program. Get support from director level executive management.	CDOT Greening Government Steering Committee, Human Resources, individual supervisors	EO D0011 & D0012 07
2	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Work with the CDOT Water Quality EMS Steering Committee to determine how the requirements of the Executive Orders can be integrated into the goals and objectives of the EMS.	Currently, the EMS manages CDOT's MS4 Construction Program permit requirements; however, CDOT intends to expand the EMS to cover CDOT's activities statewide.	CDOT Greening Government Steering Committee, CDOT Water Quality EMS Steering Committee	EO D0011 & D0012 07
3	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Work with the appropriate CDOT divisions and executive management within CDOT to develop and implement policies on materials management, purchasing, and resource management.	Each agency and department is directed in the Governor's EO to develop and implement materials management, purchasing, and resource management policies that minimize impact on public health, the environment and natural resources	CDOT Greening Government Steering Committee, CDOT personnel responsible for policy development, other CDOT divisions as needed	EO D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
4	Implement Greening State Government Initiative	Implement a system to track all the requirements of the Executive Orders	Work with all CDOT divisions on incoming RFPs to determine what tracking requirements can be included in bid specifications that help meet the requirements of the Executive Orders.	CDOT needs to start tracking type and quantity of waste generated, type and quantity of items recycled, total paper purchased, paper purchased with at least 30% recycled content, environmentally preferable products purchased, types and quantities of fuels. Many of these items can be tracked by the vendors as part of the contract requirements.	CDOT Greening Government Steering Committee, Purchasing/ Procurement, Fleet Management	EO D0011 & D0012 07
5	Implement Greening State Government Initiative	Develop and implement a system to communicate requirements associated with the Executive Orders	Work with Information Technology for use of the intranet to share information about greening the government. Consider assigning a greening government leader in each of CDOT's regional offices to better facilitate the greening government process.	The regional greening government leaders should report back to Headquarters regarding green actions that have been implemented at the regional levels.	CDOT Greening Government Steering Committee, Information Technology, other CDOT divisions as needed	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
6	Implement Greening State Government Initiative	Identify greening actions to be implemented	Look at what other state transportation departments have implemented regarding the environmental topics in this Plan. Determine if their actions could be successfully implemented within CDOT. If so, work with the appropriate CDOT divisions and create green actions that will be included in statewide CDOT Implementation Plan.	Table C of the Report and Tech Memo 1 of this research project summarize EMS efforts implemented by other state transportation agencies. The New Hampshire DOT utilizes a contractor to hydro-strip sheeting metal from worn aluminum traffic signs. The sign blanks are returned and reused and are 40% less expensive than new signs.	CDOT Greening Government Steering Committee, all CDOT divisions	EO D0011 & D0012 07 -Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
7	Implement Greening State Government Initiative	Clarify responsibility for specific functions	Clarify responsibility for certain tasks that overlap between Information Technology and Facilities Management. Develop a plan so the CDOT divisions communicate with each other and abide by the same policies or procedures. This will encourage uniformity and help to eliminate confusion. Ensure tracking systems regarding the requirements of the Executive Orders include input from both Information Technology and Facilities Management.	Currently, Information Technology and Facilities Management support the management of technology-related activities. Facilities Management handles copiers and the equipment in the Print Shop.	CDOT Greening Government Steering Committee, Information Technology, Facilities Management	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
8	Petroleum Fuel Consumption	Report to the Greening Council on an annual basis	Report to State agency progress made to date towards achieving the goal of reducing petroleum consumption. If the baseline 2005-2006 and fiscal year 2006-2007 numbers are not accurate, report the reasons why and explain whether or not there are planned future implementations that will help make these numbers more accurate (SAP).	This consumption number may not be accurate, but since the deadline to achieve the goal is 6/30/12, these numbers can be modified in a future annual report to the Greening Council. Let the Greening Council know that is your intention.	CDOT Greening Government Steering Committee	EO D0012 07 – State agencies shall report back to the Greening Council on an annual basis
9	Petroleum Fuel Consumption	Set up a system for obtaining more accurate data for future petroleum consumption.	Verify that the bulk storage consumption for each region is being entered into SAP so it is included in the consumption data.	80% of the fuel consumed by CDOT is purchased commercially. The rest is from bulk storage sources and consumption is tracked used fuel logs and entered manually into SAP by each region.	Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
10	Petroleum Fuel Consumption	Set up a system for obtaining more accurate data for future petroleum consumption.	Contact all commercial stations where Ride Express fuel cards are used and verify that the reports they set up accurately reflect the type of fuel purchased.	Reports from commercial fuel vendors are used to track fuel purchased in SAP. Some areas, specifically Craig, are billing inaccurately (ex: reports state gasoline is sold when actually diesel was purchased).	Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
11	Petroleum Fuel Consumption	Set up a system for obtaining more accurate data for future petroleum consumption.	Work with Information Technology to develop a reporting structure in SAP that can identify fuel consumption of State vehicles (excluding vehicles for law enforcement, road maintenance, and highway construction).	Per the executive order, this report should include only non-exempt vehicles. For accuracy, the report should be able to track diesel and gasoline separately from any biodiesels and other alternatives.	Fleet Vehicles, Information Technology	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
12	Petroleum Fuel Consumption	Revisit 2005-2006 baseline and 2006-2007 consumption data prior to submitting the next annual report to the Greening Council.	Review previous numbers taking into consideration any corrections made to the data (based on commercial station reports corrected for accuracy, tracking report development in SAP, historic data being uploaded into SAP, etc.). If needed, update past data reported to the Greening Council.	It is important to retroactively correct initial data submitted since the 25% reduction goal by 2012 is based off of baseline 2005-2006 data.	CDOT Greening Government Steering Committee	EO D0012 07 – State agencies shall report back to the Greening Council on an annual basis.
13	Petroleum Fuel Consumption	Encourage the use of alternative fuels.	Compile a list of CDOT fleet vehicles. Identify how many / which vehicles can run off of E-85, propane, biodiesel, CNG, or other alternative fuels. Mark those vehicles as to which fuel types they can utilize, and train employees who use those vehicles on the locations of alternative fuel stations. Provide maps of the alternative fuel stations in the vehicles. Provide tracking logs in the vehicles to track consumption of the alternative fuel for flex fuel vehicles. The EO directs all departments to set a goal to fuel flex vehicles at least 50% of	An up to date alternative fuel station locator can be found at http://afdcmap2.nrel.gov/locator/ Information on site locations can also be obtained by calling State Fleet at 1-800-356-3846 or 303-866-5566. An education plan including the labeling of state vehicles will be developed by the Greening Council. The DPA or State Fleet may	Fleet Vehicles, State Fleet	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			the time with alternative fuels.	have tracking information on the number of E-85 vehicles purchased by each agency.		
14	Petroleum Fuel Consumption	Encourage the use of alternative fuels	Create a biodiesel team across the 6 Regions (utilize future videoconferencing capability). Work with CDOT Regions to share best practices and lessons learned regarding biodiesel. Determine which diesel vehicles and equipment can be fueled with a blend of at least B20 (20% biodiesel and 80% petroleum diesel). The EO directs all agencies to utilize B-20 in diesel burning vehicles whenever available.	Region 4 / NE Colorado has been utilizing biodiesel and has identified that an agitator is needed to stir the biodiesel. Lessons learned and shared best practices will make the transition to biodiesel easier. The Alternative Fuel Use Requirement of B20 is subject to fuel availability and cost.	CDOT Regions 1 through 6, and HQ	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012 & SB 06-016 – Alternative Fuel Use Requirement
15	Petroleum Fuel Consumption	Encourage the use of alternative fuels.	Explore what vendor incentives are in place to use biodiesel or other alternative fuels, and work these incentives into the bidding process.	The Alamosa / Region 5 area will start to run Biodiesel from Greeley Blue Sun, who offers incentives.	Fleet Vehicles, Purchasing/ Procurement	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
16	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Encourage drivers to eliminate idle time whenever possible to reduce fuel consumption.	Drivers can reduce idle time in parking lots by turning off their engines while eating lunch. Also, drivers can reduce idle time in the winter by not letting their engines run in order to keep the cab warm.	Fleet Vehicles with assistance from Shop Supervisors	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
17	Petroleum Fuel Consumption	Reduce petroleum consumption in	Perform a needs assessment for each region to determine if vehicles	The Shop Supervisors for each region act as Fleet	Fleet Vehicles with assistance	EO D0011 & D0012 07 – Cut

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		current fleet.	with high fuel consumption can be replaced with vehicles with low fuel consumption. Perhaps some SUVs can be replaced with sedans or hybrids. Set a goal to reduce the number of SUVs in the fleet. The EO directs all agencies to acquire hybrid gas/electric high efficiency vehicles, alternative and flex fuel vehicles, and other fuel efficient / low emission vehicles whenever practicable.	Manager for that region. There are 9 shop supervisors that meet occasionally at roundtable discussions.	from Shop Supervisors	petroleum use in state vehicles by 25% by June 30, 2012.
18	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Identify pre-1996 light duty vehicles in fleet that have a fuel efficiency rating of less than 25 mpg. Give priority to replacing these vehicles and consider replacing them with hybrids, alternative flex fuels, or other low-emitting vehicles.	This is also a requirement of the Energy Policy Act – Alternative Fueled Vehicle (AFV) Acquisition Mandate. 75% of model year 2000 and beyond vehicles purchased each year by State agencies with more than 50 light-duty vehicles must be AFVs.	Fleet Vehicles, Purchasing/ Procurement	EO D0012 07 - Cut petroleum use in state vehicles by 25% by June 30, 2012. & EAct 507 - Alternative Fueled Vehicle (AFV) Acquisition Mandate

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
19	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Review justification requirements for purchasing SUVs and trucks (less than one ton). Determine if the State Fleet requirements are looser than CDOT needs. If so, tighten the requirements through development and implementation of a CDOT vehicle policy, or else work with State Fleet to refine their policy. The EO directs all agencies to restrict the purchase of four-wheel drive SUVs.	The Greening Council was formed under Owens' EO D005 05 to develop, implement, and augment policies. Perhaps suggestions can be made to State Fleet policies by the Greening Council.	Fleet Vehicles, CDOT Greening Government Steering Committee	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
20	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Work with the Greening Council and ensure that CDOT ideas uncovered through this research project are reported to the Greening Council for incorporation into the transportation efficiency audit and resulting improvement process of the state fleet.	By 12/1/07, the Greening Council is required to complete a transportation efficiency audit addressing methods for improving the environmental efficiency of the state fleet. An education plan including the labeling of state vehicles that utilize alternative fuels will be developed by the Greening Council.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
21	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Encourage the development of Transportation Management Associations (TMA) and provide technical assistance to their efforts.	TMA is a group of non-government entities that promote the use of alternative modes of transportation.	Planning	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
22	Petroleum Fuel Consumption	Encourage the use of alternative modes of	Identify opportunities for Planning and Property Management to work	Currently, Planning and Property Management	Planning, Property	EO D0011 & D0012 07 – Cut

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		transportation	together to lease/build office space close to alternative modes of transportation.	only work together to ensure parking is available. By selecting office locations close to public transportation, employees are more likely to utilize public transportation instead of driving.	Management	petroleum use in state vehicles by 25% by June 30, 2012.
23	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation or reduced driving	Offer incentives to employees for reducing petroleum consumption associated with driving. Offer preferred carpool and hybrid parking at offices. Consider purchasing a fleet of bicycles for employees to utilize when going to meetings or light rail locations.	CDOT used to offer preferred carpool parking, but it is no longer recognized.	Planning, Human Resources	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
24	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Include information on alternative modes of transportation in employee paycheck/stub envelopes, Public Announcements, and other employee information sources.	Ensure all employees are aware of the commuter program.	Planning, Human Resources, IT, Public Relations	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
25	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Determine if switching to Eco Pass will encourage additional Front Range CDOT employees to utilize alternative transportation to work. Work with Human Resources, Planning, and possibly Denver regional Council of Governments (DRCOG) to administer the survey.	CDOT is planning on performing a survey before deciding whether or not to purchase Eco Passes.	Planning, Human Resources	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
26	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Promote a Demonstration of Alternative Transportation Day where employees can learn how to	CDOT is considering purchasing Eco Pass. If they decide to purchase	All CDOT divisions, Planning	EO D0011 & D0012 07 – Cut petroleum use in

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			use alternative transportation to travel to meetings and to and from home.	Eco Passes for employees, this type of training should be available.		state vehicles by 25% by June 30, 2012.
27	Petroleum Fuel Consumption	Reduce fuel used for vehicles while traveling on state business	Reduce fuel used for vehicles while traveling on state business. All state employees shall give preference to major airports physically close to the destination and close to a mass-transit system. Employees shall use mass-transit when traveling whenever feasible.	These are specific requirements in the Executive Order.	All CDOT employees who travel	EO D0012 07 – Greening of State Fleet Management
28	Energy Conservation	Implement easy energy conserving changes in the offices	Implement simple changes to reduce the amount of energy consumed in the office place. Discourage personal printers at individuals’ desks when Energy Star main printers can be utilized. Or else require that Energy Star be purchased. Provide power strips with on/off devices so employees’ radios, monitors, and other personal electronics at their desks can be powered off with the click of the power strip. Provide Compact Fluorescent Lightbulbs (CFLs) to employees who have lamps at their desks that currently utilize incandescent (regular) light bulbs. De-lamp the soda machine. Replace incandescent exit signs with LED exit signs. Replace windows with Energy Star windows.	CDOT could encourage participants by offering an employee incentive that is allowable by both HR and divisional or regional manager of those employees. IT offers a list of Energy Star recommended printers on the CDOT intranet.	All CDOT divisions	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.

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29	Energy Conservation	Create energy champs!	Assign volunteer energy champs to various energy conserving tasks – Mark all the power strips and other energy saving items CDOT distributes with an energy distinction or logo that CDOT creates. Assign volunteer energy champs the task of circulating office areas to turn off power strips at the end of the workday or work week. Determine what equipment is operating and not needed in the evenings (desk fans, printers, desk lights, bathrooms lights). Turn this equipment off, or work with janitorial to turn it off after cleaning is complete in the evenings.	CDOT could encourage volunteers by offering an employee incentive that is allowable by both HR and divisional or regional manager of those employees.	All CDOT divisions, Facilities Management	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
30	Energy Conservation	Change human behavior	Consciously turn off lights in offices, conference rooms, kitchens, bathrooms when not being used. Consider installing motion detector sensors for rooms that are not used frequently.	Train employees to be more energy conscious at work. It may be easier to influence their habits at work by encouraging energy conserving behavior at home.	All CDOT divisions	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.

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31	Energy Conservation	Change human behavior	Develop and implement an employee energy challenge to increase employee awareness. Have each division challenge their staff to track their personal energy consumption for at least the past year. Challenge them to reduce their own consumption. Find a charity that would be willing to accept regular light bulbs. Create a donation box for employees to bring in all their incandescent (regular) light bulbs after they have changed them out. Create an employee suggestion box.	Train employees how to be more energy conscious. Supply them information and make the process easy for them. Provide them with information about the actual energy and financial savings from someone who has made their house more energy efficient. Supply incentives for challenge winners.	All CDOT divisions, Human Resources	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
32	Energy Conservation	Reduce the environmental impact of existing buildings	Implement quick fixes such as additional door stripping and better seals to minimize air leaks in CDOT buildings.	There is a big gap by the front door of the DTD building. Staff utilizes space heaters to compensate for the difference in temperature caused by the air leaks.	Facilities Management	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
33	Energy Conservation	Encourage energy efficiency	Work with the Metro Planning Organization to give incentives for energy efficient projects.	Currently, anything within Federal Guidelines is acceptable.	Planning, Environmental	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
34	Energy Conservation	Include green requirements in bid specifications	Work with FHWA to determine what can be included in bid specifications that help meet the Executive Order requirements. Require that funds for programs like the Congestion Mitigation Air Quality Program (CMAQ) include a	CDOT is currently responsible for distributing Federal Highway Administration funds. There are no policies in place that require the funds be used	Planning, Purchasing / Procurement	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			specific percentage of funds be used for energy efficient programs.	for environmentally friendly services.		
35	Energy Conservation	Reduce energy consumption	Develop general computer training that teaches employees how to set monitors to sleep after a few minutes of inactivity.	Monitors are currently set up by Information Technology to sleep after 30 minutes of inactivity.	Information Technology	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
36	Energy Conservation	Reduce the environmental impact of existing buildings	Contact the Governor’s Energy Office (GEO) to review the CDOT RFP and any contractual language in the performance contract. The number to the Governor’s Energy Office is 303-866-2201; contact is Seth Porter. The Greening Government Manager will be ensuring that each agency has developed an energy management plan by January 2008.	The GEO consists of expert staff that specializes in reviewing performance contracts and performance payback in order to maximize gains. This is a free service offered to State agencies.	Facilities Management, Purchasing/ Procurement	EO D0014 03 – Requires state agencies to initiate performance contracts where opportunities exist to better utilize budgets; Executive Order D 005 05 – Reduction of state energy consumption
37	Green Building (energy conservation, water conservation, material use)	Incorporate green building practices into all Facilities and Property Management	Work with Property Management to identify the green building practices that relate to the activities of Facilities Management. Identify how Facilities Management and Property Management can work together to better meet the goals of LEED and the Executive Orders. Ensure tracking systems include input from both Facilities Management and Property Management.	Many of the elements in LEED, if implemented, will contribute towards meeting the specific goals in the Executive Orders. This task will be addressed in more detail as part of Phase 2 of this project.	Facilities Management, Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of

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						State Government
38	Water and Energy Conservation	Reduce the environmental impact of existing buildings	Work with the Regions and with Property Management and/or Facilities Management regarding energy and water conserving initiatives that could be implemented at rest stops (efficient light bulbs, light sensors, vending machine lamps, faucet aerators, flow restrictors in toilets).	It is unclear who is responsible for rest stops - Regions, Facilities Management, or Property Management.	Facilities Management, Property Management, Facilities Management, CDOT Regions	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
39	Water Conservation	Set up a system for obtaining more accurate data for future water consumption.	Install a system to measure the gallons of well water consumed at CDOT Headquarters. Include the consumption of well water in the total gallons of water consumed by CDOT. This information would be reported to the CDOT Greening Government Steering Committee, then reported to the Greening Council for inclusion in an annual report to the Governor.	Currently Headquarters utilizes well water and city water. Headquarters is not tracking consumption of well water in the total gallons of water consumed.	Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
40	Water Conservation	Reduce the environmental impact of existing buildings	Contact Denver Water to perform a free water audit to determine if water consumption can be reduced at Headquarters. The auditor at Denver Water is Henry Young and he can be reached at 303-525-1451.	The water auditor will determine which fixtures inside the buildings can be fitted with aerators to reduce the flow, and he will provide and install these aerators for free. He will also audit sprinkler systems, meters, or other systems to	Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.

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				determine if the system is working properly and efficiently. The Denver Water records show that Headquarters has three buildings as water accounts.		
41	Water Conservation	Implement easy water conserving measures	Install flow restrictors on toilets, and install flow restricting aerators at rest stops and across offices.		Facilities Management, Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
42	Water Conservation	Increase employee awareness	Implement a water conservation awareness and outreach program, and implement training. Solicit employee ideas. Place stickers in restrooms encouraging water conservation.	Training modules are available at www.co.train.org . Additional water conservation websites are www.ourwater.org and greenco.org .	Facilities Management, Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
43	Water Quality	Increase awareness about protecting water quality	Identify where manholes and storm gutters outlet and label them appropriately. If they outlet to storm sewer (not sanitary sewer), then stencil around them to indicate that they outlet to waterways without first being treated.	The manhole grate cover for the triple basin system in the shop wash bay area indicates that water outlets to the storm sewer. Personnel did not think this was the case.	Facilities Management	State of Colorado Greening Government Implementation Guide
44	Materials and Resource Management	Quantify recycling efforts	Determine what items are being recycled and in what quantities. For paper, steel, and mixed waste streams, this information should be available through the vendors. Ensure that future contracts with recycling vendors include requirements to tally up the total	A dual stream recycling program was implemented at Headquarters but not in other offices. Most shops recycle steel, tires, used oil.	CDOT Greening Government Steering Committee, Environmental, Purchasing / Procurement, Maintenance	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			pounds of recycled materials generated.			
45	Materials and Resource Management	Quantify waste generation	Determine how much waste and what types of waste are being generated by CDOT activities. Ensure that future contracts with waste haulers include requirements to tally up and report the type and total pounds of waste being picked up.	This includes waste being generated by regional offices, maintenance shops, and all activities performed by CDOT.	Fleet Vehicles, Facilities Management, Property Management	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
46	Materials and Resource Management	Set up a system to track waste from maintenance activities more accurately	Track waste generated from maintenance activities. Ensure that waste generated by the maintenance of non-CDOT vehicles is not counted in the total waste generated by CDOT. Either stop performing maintenance on non-CDOT vehicles, or else track the waste generated by non-CDOT vehicles so it can be subtracted from the total waste generated. Also, implement a system to track general trash that is picked up from the roads. This should not be tracked as general trash that CDOT generates.	Shop managers do a daily work log in SAP. Once in a while, maintenance is performed on non-CDOT vehicles. For example, a Division of Wildlife or Department of Revenue vehicle is serviced and that agency is billed by CDOT. General trash that is picked up from the roads gets accounted for in waste streams generated by CDOT.	Fleet Vehicles	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
47	Materials and Resource Management	Identify opportunities to reduce waste	Determine if any of the wastes currently being disposed of can be reduced, re-used, recycled, or composted. Research recycling or re-use options that are available for the different waste streams. Establish and promote waste	Focus recycling efforts on the most commonly generated materials. Also, look across CDOT to identify opportunities. Some shops recycle used oil filters for steel while	CDOT Greening Government Steering Committee , All CDOT divisions	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			reduction / recycling goals and opportunities.	some do not.		existing facilities.
48	Materials and Resource Management	Set up a system for obtaining more accurate data for future Information Technology equipment waste generated	Track the percentage of Information Technology equipment that is recycled/reused or disposed of through Juniper Valley.	Currently, Information Technology only knows the amount of equipment that is given to Juniper Valley. They do not receive information on the amount of waste generated and recycled.	Information Technology	EO D0011 & D0012 07 -Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
49	Materials and Resource Management	Identify opportunities to reduce waste	Work with Juniper Valley to determine if old machines and cell phones can be donated to other state agencies or non-profits rather than being thrown away as trash. Include in the bid specification that equipment should be donated if it cannot be sold.	Currently, CDOT pays \$6-\$8 per machine for equipment that Juniper cannot re-sell and is disposing of as trash.	Information Technology, Purchasing / Procurement	EO D0011 & D0012 07 -Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
50	Paper Consumption	Set up a system to track consumption for future paper consumption reporting.	Set up a system within CDOT to easily track future paper purchases – both total paper purchased and paper purchased with more than 30% recycled content.	Each region has a business office that makes purchases of less than \$5000. There are 10 or more CDOT business offices statewide. Work with the business offices to implement a reporting system for paper purchases.	CDOT Greening Government Steering Committee, Business Offices, Purchasing / Procurement	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content;
50				Alternatively, work with purchasing to require the vendors to provide this information as a contract requirement.		EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.

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51	Paper Consumption	Reduce paper consumption	Determine if electronic signatures can replace wet signatures. Pose this question to the Greening Council. There may be the potential to influence the upcoming administrative rules regarding use of electronic signatures by state agencies that will be coming from the Secretary of State.	The Uniform Electronic Transaction Act (UETA) allows for use of electronic signatures, and the Secretary of State (SoS) was granted broad rulemaking authority under UETA. The SoS will be adopting administrative rules that apply to all state agencies. More information can be obtained from barbara.groth@sos.state.co.us	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
52	Paper Consumption	Reduce paper consumption	Change the print shop work order form so it can be submitted electronically rather than requiring a printed version.	Currently, the work order form available on the CDOT intranet cannot be submitted electronically. Orders must be submitted to the Print Shop by printing out the actual form.	CDOT Greening Government Steering Committee, Print Shop, Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
53	Paper Consumption and Material Use	Reduce paper consumption and waste	Set all color printers to print double-sided as the standard setting. Ensure that all printers are in fact set to print double-sided as the standard setting.	Printing double-sided will reduce paper consumption and waste generated.	Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
54	Paper Consumption and Material Use	Reduce paper consumption and waste	Start tracking the number of desktop printers and reduce the number of desktop printers. For those employees who need desktop printers due to the privacy of the material being printed, encourage the purchase and use of a duplexer. Duplexers will enable double-sided prints without the inconvenience of having to turn the paper around in the middle of the print job.	Desktop printers are usually not capable of printing double-sided which increases the amount of paper used. Also, the desktop printer toner cartridges are replaced more frequently and create more waste.	All CDOT divisions, Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
55	Paper Consumption and Material Use	Reduce paper consumption and waste	Consider installing projectors in conference rooms so electronic agendas can be utilized. Or provide more projectors, White boards, and other means of providing one agenda copy.	Currently, printed versions of all handouts are distributed for meetings.	Information Technology, Facilities Management, Property Management	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
56	Paper Consumption and Material Use	Reduce paper consumption and waste	Develop training on reducing paper consumption and waste from computers. Include in the training how to print double-sided on desktop printers; why employees should not print out emails; why employees should not uncheck the default settings in print options, and the environmental benefits of a paperless office goal.	Increase employee awareness about simple easy changes that can help CDOT meet goals regarding waste generation and paper consumption.	Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
57	Waste Reduction	Educate employees on waste reduction	Make information available to employees on how they can reduce and recycle waste generated in their homes. Inform them about resources to stop junk mail received in the office and at home.	Visit www.dmaconsumers.org to get names and addresses off junk mail mailing lists. Contact greendimes.org to purchase a service to do so more efficiently. Email DistributionConcerns@Yellowbook.com to remove your address from the yellow phone book delivery list.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
58	Waste Reduction	Encourage employees to reduce waste	Designate a “re-use area” for employees to re-circulate / reuse unwanted desk supplies. Increase employee awareness through large recycling signs placed where applicable. Publicize waste reduction and recycling data to progress towards meeting goals. Challenge employees to continually	Increase employee awareness about simple easy changes that can help CDOT meet goals regarding waste generation.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			improve each year.			
59	Waste Reduction and Environmentally Preferable Purchasing	Encourage environmentally preferable purchasing	Work with the DPA to obtain information about recycling / solid waste contracts that may be assessed to assist and improve agency waste reduction programs.	This action step was recommended in the Guide developed by the Greening Council	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Environmental Preferable Products
60	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Change the print shop work order form so there is an option for selecting recycled paper. Specify the requirement for state agencies to purchase recycled content paper on the order form itself to increase employee awareness.	Currently, the order form does not have an area where a customer can select recycled paper options.	CDOT Greening Government Steering Committee, Print Shop	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content
61	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Implement a CDOT policy that mandates printing jobs coming from CDOT to be completed on recycled paper whenever possible.	There are no CDOT policies in place currently, and printing jobs are performed as requested by the customer or as supplied at the print and copy machines	CDOT Greening Government Steering Committee, Print Shop, Director of DTD	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content
62	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Work with purchasing and the office supply consortium to further promote the purchase, definition, and availability of green products. Require that all state awarded office supply vendors implement discounts on purchases of green products. Make this a requirement of the contract.	Currently, there are 6 approved office supply vendors. Three of them offer a 1% discount on green products. The office supply consortium consists of multiple agencies including CDPHE, Department of Labor and Employment, Department of Revenue, Department of Corrections, and CDOT.	CDOT Greening Government Steering Committee, Purchasing / Procurement	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
63	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Develop a uniform office supply order form for use throughout the business offices. Include a column that indicates whether the product being ordered is considered green. Specify the requirement for state agencies to purchase green on the order form itself to increase employee awareness.	This was implemented in the past at DTD, but it was discontinued. The current order forms at DTD and elsewhere do not include a green column.	CDOT Greening Government Steering Committee, Business offices	EO D0011 & D0012 07 - Environmental Preferable Products
64	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Work with the employees of CDOT that approve products for the CDOT Approved Products List and Specification Book to determine if environmental aspects (ease of recycling, life-cycle, toxicity, etc.) are taken into consideration during the product approval process.	Purchasing indicated that Dave Kotzer heads up the staff that is responsible for product approval and updates to the Approved Products List.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Environmental Preferable Products
65	Environmental Preferable Purchasing	Implement better controls on small discretionary purchases	For those purchases that cost less than \$5,000 and do not go through Purchasing / Procurement, implement better controls or procedures to ensure that environmentally sound products are being purchased. These controls or procedures should be enforced for all employees who have purchasing cards or employees who can get reimbursed for using personal funds.	If a shop runs out of an item, an employee can purchase it with their Purchase card and have the freedom to select any brand that they want with no written guidelines. Divisions within CDOT can purchase any type of desktop printer. IT has published guidelines on the CDOT intranet that specify Energy Star models, but these guidelines are not enforced.	Fleet Vehicles, All CDOT divisions, Accounting	EO D0011 & D0012 07 - Environmental Preferable Products

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
66	Environmental Preferable Purchasing	Include green requirements in bid specifications	Work with all CDOT divisions on incoming RFPs to determine what can be included in bid specifications that help meet the requirements of the Executive Orders for environmental preferable products. Require that bids are submitted on recycled paper, double-sided printing, electronic copies are provided, and are free from unnecessary attachments.	Where applicable, include requirement for recycled materials to be used in the project, Energy Star products to be used, remanufactured items to be used, and other environmental preferable preferences that relate to the bid request.	Purchasing / Procurement, All CDOT divisions,	EO D0011 & D0012 07 - Environmental Preferable Products
67	Environmental Preferable Purchasing	Include remanufactured requirements in bid specifications	Work with Purchasing / Procurement to include in the bid requirements that the suppliers of the large copy machines utilize remanufactured toner.	The contractors that supply the large copiers determine the type of toner that those copiers utilize.	Print Shop, Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
68	Environmental Preferable Purchasing	Re-work pricing of recycled content material	Work with Purchasing / Procurement to require a discount on recycled paper purchases when bidding.	The paper contract is renewed every 6 months for re-pricing. Paper is purchased through Purchasing/Procurement, and the Print Shop for quantities that exceed \$5000.	Print Shop, Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
69	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Check if there is a Hewlett Packard supported re-manufactured toner that could be used in network printers. Ensure future contracts with Hewlett Packard require use of re-manufactured toners.	All toners are currently recycled, but Information Technology could see if re-manufactured toners are available from Hewlett Packard.	Information Technology, Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
70	Environmental Preferable Purchasing	Use local materials	Work with all CDOT divisions on incoming RFPs to determine what can be included in bid specifications regarding local	If possible, include a requirement for local materials. A discussion with purchasing	Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			materials. The requirement for local materials cannot impact free trade.	identified that CDOT cannot require that local companies respond, but perhaps CDOT can require that a certain percentage of local materials be incorporated in the project.		Products
71	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Designate a person within Purchasing / Procurement to stay abreast on environmental preferable purchasing advancements and decisions made within state government. This person should work with DPA to stay on top of environmentally preferable purchasing news. This person should participate in green purchasing conferences, training, workshops, and appropriate awards and recognition programs. Assign this person the responsibility of sharing information with the other members of Purchasing/ Procurement.	Purchasing/ Procurement has been thinking about designating a person to stay abreast environmental preferable purchasing topics.	Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
72	Environmental Preferable Products	Encourage environmentally preferable purchasing	Designate a person within IT to track environmentally preferable purchases and green efforts implemented that relate to technology. Have this person report this information to the CDOT Greening Government Steering Committee for reporting to the Greening Council.	This person should work closely with the Regional Analysts to ensure that green information is tracked across CDOT statewide.	Information Technology	EO D0011 & D0012 07 - Environmental Preferable Products

Table H. Recommended Green Actions and Tasks to be Implemented by Property Management

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
1	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	Identify the green building practices that relate to the activities of Property Management. Summarize LEED-EB and LEED-NC rating systems. Identify which elements and specific credits of the rating systems could potentially be integrated into Property Management’s activities.	Many of the elements in LEED, if implemented, will contribute towards meeting the specific goals in the Executive Orders. This task was discussed as part of Phase 2 of this project.	Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government
2	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	Train and empower employees on green building practices that relate to Property Management’s activities. Develop a training presentation that includes all the elements in LEED-EB and LEED-NC that relate to Property Management’s activities. Ensure that Property Management employees are trained and familiar with applicable green building activities.	Many of the elements in LEED, if implemented, will contribute towards meeting the specific goals in the Executive Orders. This task was discussed as part of Phase 2 of this project.	Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
3	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	Appoint a green building champion within Property Management. Assign this person the responsibility for keeping abreast on green building practices and sharing information with the other members of Property Management.	Since there are so many sources of information regarding green building, it is useful to have one person follow this information.	Property Management	EO D0011 & D0012 07 – Greening of State Government
4	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	If a new Glenwood Springs multi-agency building is built, incorporate LEED-NC into the planning, design, and construction.	Based on how the new building will be funded, green building certification may be required. This is a perfect opportunity for an interagency green building effort and should be publicized as such.	Property Management, Public Relations	Senate Bill 07-051 (4/16/07) - Requires any new or renovated building whose total project cost includes 25 percent or more in state funds to be designed and built to a high performance green building standard and certified by a third party.
5	Green building (energy conservation, water conservation, material use)	Be involved in the decision-making process	Assign someone the task of participating in the Greening Government Steering Committee.	The information from the Steering Committee will be shared with the Greening Council. Since buildings have such a large environmental impact, it is important that somebody from	Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				Property Management be represented.		of State Government
6	Green building (energy conservation, water conservation, material use)	Be involved in the decision-making process	Identify how and where green building practices can be incorporated into the Office of the State Architect Policies and Procedures (design/bid/build project basic steps checklist). Share these suggestions at the CDOT Greening Government Steering Committee so they can be communicated to the Greening Council.	The Greening Council has been tasked with developing, implementing, and augmenting programs, plans and policies that relate to greening the government. This is a perfect opportunity to influence state processes.	Property Management, CDOT Greening Government Steering Committee	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government
7	Green leasing	Be involved in the decision-making process	Identify how and where green leasing practices can be incorporated into new leases of state facilities. Take into consideration energy efficiency, water conservation, recycling, and access to public transportation. Share these suggestions at the CDOT Steering Committee so they can be communicated to the Greening Council.	The Greening Council, working with the Greening Government Manager, has been tasked with developing sustainability standards for new leases of state buildings. The standards will address, at a minimum, energy efficiency, water conservation,	Property Management, CDOT Greening Government Steering Committee	EO D0012 07 – Resource Management

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				recycling, and access to public transportation.		
8	Green building (energy conservation)	Reduce the environmental impact of existing buildings	Contact the Governor's Energy Office to perform a free assessment of the energy consumption in relation to LEED-EB to identify what, if any, improvements would be financially beneficial and worthy of energy performance contracting. This should be done at Camp George West, 4670 Holly, 425 Corporate Circle, and Arapahoe / Centennial. The number to the Governor's Energy Office is 303-866-2201; contact is Seth Porter.	Although these 4 buildings have been brought on within the past 15 months, there is a team of engineers within the Governor's Energy Office who specialize in existing buildings. This is a free service.	Property Management	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
9	Green building (water conservation)	Reduce the environmental impact of existing buildings where owned, rented, or leased.	Contact Denver Water to perform a free water audit to determine if water consumption can be reduced. This should be done at Camp George West, 4670 Holly, 425 Corporate Circle, and Arapahoe / Centennial. The auditor at Denver Water is Henry Young and he can be reached at 303-525-1451.	The auditor will determine which fixtures inside the buildings can be fitted with aerators to reduce the flow, and he will provide and install these aerators for free. He will also audit sprinkler systems to determine if the system is working properly and efficiently.	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
10	Green building (water conservation)	Reduce the environmental impact of existing buildings	Determine if some of the grass at Corporate Circle can be replaced with xeriscaping to reduce water consumption. If this is acceptable by the corporate complex, install xeriscaping in place of some or all of the grass.	Corporate Circle is the building with the highest water consumption of all 4 buildings managed by Property Management.	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
11	Green building (water and energy conservation)	Reduce the environmental impact of existing buildings	Encourage green building throughout CDOT. Work with the Regions regarding energy and water conserving initiatives that could be implemented at rest stops (efficient light bulbs, light sensors, vending machine lamps, faucet aerators).	If funds do not go through FHWA for rest stops, then each region is responsible for building / maintaining rest stops.	Property Management, CDOT Regions	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
12	Water and Energy Consumption	Compile baseline data for 2005-2006 water and energy consumption	Work with Facilities Management to compile baseline data for 2005-2006 water and energy consumption. Determine if this information was submitted to the State Architect and DPA for previous years' consumption. Determine how the numbers were compiled and if the numbers were accurate. If the numbers were not accurate, identify and correct any inaccuracies.	Joe Mahoney in Facilities Management has information on consumption at Headquarters. He stated that Johnny Olson may have these data for maintenance buildings.	Property Management, Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
13	Water and Energy Consumption	Compile consumption data for 2006-2007 water and energy	Work with Facilities Management to develop a uniform system to make sure water and energy consumption for all CDOT-owned	Joe Mahoney in Facilities Management has information on	Property Management, Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
		consumption	buildings is tracked accurately. Currently, tracking of energy and water consumption is taking place within Property Management and Facilities Management. Make sure these numbers are being combined for accurate consumption reporting for 2006-2007 data.	consumption at Headquarters. He stated that Johnny Olson may have these data for maintenance buildings.		consumption by 20% by 2012.
14	Water and Energy Consumption	Set up a system for obtaining more accurate data for future water and energy consumption.	Work with Capital Complex to determine if CDOT's water and energy consumption can be tracked separately from the other agencies that share the Camp George West Campus.	Greg McKlinton at Capital Complex should be able to determine if CDOT's consumption can be tracked separately.	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
15	Water and Energy Consumption	Set up a system for obtaining more accurate data for future water and energy consumption.	Work with utility companies in various areas where CDOT leases property to CDOT employees. Determine if energy and water consumption at leased properties can be separated by property. Determine if this number should be included in the annual consumption data that is reported to the Greening Council.	Current utility consumption is not tracked at all CDOT owned properties, because of how billing is set up.	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
16	Petroleum Fuel Consumption	Reduce the amount of petroleum consumed in vehicles.	Consider hybrid or flex fuels vehicles for use by Property Management.	Property Management currently utilizes a Jeep Cherokee, Blazer, Taurus, Intrepid, and Trailblazer as fleet vehicles. Property Management	Property Management, Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				expressed interest in utilizing hybrids.		
17	Petroleum Fuel Consumption	Reduce the amount of petroleum consumed in vehicles.	Contact Planning to obtain a summary of the Commuter Program in place within CDOT. Notify Property Management employees that this incentive is in place to encourage alternative transportation to work.	At least one employee in Property Management utilizes public transportation to get to and from work, but is not aware of the commuter incentives put in place by the Planning Group.	Property Management, Planning	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
18	Paper Consumption	Compile baseline data for 2005-2006 paper consumption.	Determine how much paper was consumed for fiscal year 2005-2006 (both paper without recycled content and paper with more than 30% recycled content).	Property Management uses Inovus as a paper supplier.	Property Management, Business Office	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
19	Materials and Resource Management	Quantify recycling efforts.	Contact Capital Complex or contact Weyerhaeuser to determine how much paper is being recycled by Property Management. Also, determine if additional recycling services are also available under their contract (cans, bottles, cardboard).	Currently, Property Management recycles paper. This service was set up through Capital Complex who manages the Camp George West Campus.	Property Management, Capital Complex	

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
20	Paper Consumption	Reduce paper consumption	Work with IT to implement the SAP changes so that Property Management does not have to print out a hard copy backup for everything that is managed through SAP.	Once the SAP changes are implemented, Property Management will utilize much less paper.	Property Management, IT	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
21	Paper Consumption	Reduce paper consumption.	Determine if electronic signatures can replace wet signatures. Pose this question to the CDOT Greening Government Steering Committee so it can be communicated to the Greening Council. There may be the potential to influence the upcoming administrative rules regarding use of electronic signatures by state agencies that will be coming from the Secretary of State.	The Uniform Electronic Transaction Act (UETA) allows for use of electronic signatures, and the Secretary of State (SoS) was granted broad rulemaking authority under UETA. The SoS will be adopting administrative rules that apply to all state agencies. More information can be obtained from barbara.groth@sos.state.co.us	Property Management, CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
22	Environmental Preferable Purchasing	Use more recycled paper	Check to see when the contract for the fax machine expires and determine if one of the state-approved vendors has fax machines that accept recycled content paper.	All the printers utilized by Property Management accept recycled content paper, but the fax machine does not accept	Property Management	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				recycled content paper.		consumption by 20% by 2012.
23	Environmental Preferable Products	Use environmentally friendly cleaning products	Work with purchasing to specify that contract bids for janitorial services include the requirement to use green cleaning products.	The Property Management Team is getting ready to determine requirements for the 2008 janitorial services contracts.	Property Management; Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
24	Environmental Preferable Products	Use products with recycled content	Work with purchasing to determine what can be included in bid specifications for the design and build bid process.	If possible, try to include a requirement for recycled materials.	Property Management; Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
25	Environmental Preferable Products	Use local materials	Work with purchasing to determine what can be included in bid specifications for the design and build bid process.	If possible, try to include a requirement for local materials. A discussion with Purchasing identified that CDOT cannot require that local companies respond, but perhaps CDOT can require that a certain percentage of local materials to be incorporated.	Property Management; Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products

This Project identified CDOT's activities that provide opportunities to green CDOT. To green CDOT means to implement actions that will reduce the adverse environmental impact of CDOT's activities. Greening of CDOT will support the two Greening of State Government Executive Orders signed by Governor Ritter on April 16, 2007 as well as additional requirements currently in place for Colorado state agencies and departments.

The purpose of the research was to begin to identify how the different divisions within CDOT function and the activities they perform. By understanding the individual processes and activities within each division, CDOT Research was able to identify some of the green actions that have been implemented within two divisions of CDOT. Research identified what additional green actions can potentially be implemented in order to comply with the requirements of the executive orders. Also, the research helped identify that the following additional areas should be visited and further researched in Phase 2 of the Greening Government Research Project:

- CDOT Greening Government Steering Committee
- CDOT EMS Steering Committee
- Colorado Greening Government Coordinating Council
- Executive Management
- Human Resources
- Accounting
- Environmental Branch of DTD and Regions
- Business Offices
- Approved Products List staff
- A small sample of the following roles from CDOT Regions 1 through 6
 - Shop Supervisors
 - Regional IT Analysts
 - Business Managers
 - Office Operations
- Division heads responsible for SAP training in the following modules:
 - Plant Maintenance
 - Materials Management
 - Real Estate

- Sales and Distribution
- Learning Solutions
- Business Data Warehouse

The purpose of Phase 2 of the Greening Government Research Project will be to incorporate additional research into the Phase 1 efforts to date. Additionally, Phase 2 of the research will expand the recommendations from the Phase 1 pre-implementation plans into a statewide CDOT Greening Government Implementation Plan. The CDOT Greening Government Implementation Plan will enable CDOT to meet the requirements of the executive orders as well other state agency greening requirements listed in **Table A** of this Report.

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APPENDIX A

D0011 07 EXECUTIVE ORDER

GREENING OF STATE GOVERNMENT: GOALS AND OBJECTIVES

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, I, Bill Ritter, Jr., Governor of the State of Colorado, hereby issue this Executive Order to establish goals and objectives, designed to reduce the environmental impact of state government.

1. Background and Purpose

The daily activities of State government have a significant impact on the quality of Colorado's public health, environment and use of its natural resources. This order charges State departments, agencies and offices to take a position of leadership in the new energy economy by reducing state energy consumption, increasing state use of renewable energy sources, increasing the energy efficiency and decreasing the environmental impact of the state vehicle fleet, implementing environmental purchasing standards and requiring attention to energy and environmental impacts of purchasing and materials decisions.

The purpose of this order is to provide clear guidance and directive to all state agencies and offices in the greening of state government in the State of Colorado. This Executive Order applies to all state departments, agencies and offices that report to the Governor. This Executive Order also establishes Greening Government Manager ("Manager") within the Governor's Energy Office ("GEO") to facilitate the goals and objectives within this order.

This Executive Order modifies but does not replace Executive Order D 005 05. The Greening of State Government Coordinating Council ("Council") formed pursuant to Executive Order D 005 05, shall continue under the lead of the GEO. The elements of Executive Order D 005 05 will remain in place and are to be read in conjunction with this Executive Order.

2. Directive

A. Greening Government Manager

I hereby order the creation of a Greening Government Manager within the GEO. The manager shall facilitate reduction of environmental impacts through implementation of departmental energy plans and will assist state departments and agencies in achieving the goals and objectives of this order and as established by the Council. Working closely with state departments, agencies, and the Council, I direct the Manager to implement a sustainability management system to track energy efficiency, water conservation, recycling, fleet operations, and environmentally preferable purchasing. Working closely with the Department of Personnel and Administration ("DPA") and Department of Public Health and Environment ("DPHE"), the Manager shall also undertake primary coordinating responsibilities for the Council.

B. Greening Government Council

Each Executive Director shall appoint a department or agency representative for participation in the Council as created in Executive Order D 005 05. The Council shall develop the appropriate policies and procedures to implement the goals and objectives of this order, including any exemptions or exceptions to the standards that the Council deems appropriate.

The Council shall prepare an Annual Report Card on the achievements under this order for review and to inform recommendations for additional action by the Governor. The Council shall develop educational materials for state employees on sustainability, stewardship, climate change, and other environmental issues, so that employees better understand the reason for this Executive Order. All agencies and departments shall educate employees regularly using these materials. DPHE shall maintain an environmental outcomes database to track environmental measurements for Greening Government efforts. All state departments shall report to DPHE the measures required for the database.

C. Specific Goals and Objectives

I direct the Manager and Council to work with all state agencies and offices to achieve the goals described below:

i. For Energy Management

- ▶ By fiscal year 2011-2012, achieve at least a 20% reduction in energy consumption of state facilities below fiscal year 2005-2006 levels;
- ▶ By January of 2008 develop or update an energy management plan and ensure development of a study determining feasibility of energy performance contracting for all state owned facilities;
- ▶ On an ongoing basis, assess and implement where effective, the development of state renewable energy projects with the support of GEO.

ii. For materials and resource management:

- ▶ By fiscal year 2008-2009, develop purchasing policies to reduce the state's environmental impact as a consumer of products and services;
- ▶ Adopt a goal of "zero waste" from construction of new buildings and operation and renovation of existing facilities;
- ▶ Achieve a paper use reduction goal of 20% by fiscal year 2011-2012 using fiscal year 2005-2006 as a baseline;
- ▶ Achieve a reduction of water consumption goal of 10% by fiscal year 2011- 2012, using fiscal year 2005-2006 as a baseline;
- ▶ DPA, in cooperation with DPHE, shall develop purchasing policies for selecting environmentally preferable products.

iii. For vehicle petroleum consumption

- ▶ By June 30, 2012, achieve a 25% volumetric reduction in petroleum consumption by state vehicles measured against a fiscal year 2005-2006 baseline, while increasing energy efficiency of the fleet (excluding vehicles used for law enforcement, emergency response, road maintenance, and highway construction).
- ▶ By December 1, 2007, complete a transportation efficiency audit addressing methods for improving the environmental efficiency of the state fleet.

3. Duration

This Executive Order shall remain in force until further modification or rescission by the Governor.

GIVEN under my hand and the
Executive Seal of the State
of Colorado, this 16th day of
April 2007.

Bill Ritter, Jr.
Governor

APPENDIX B

D0012 07 EXECUTIVE ORDER GREENING OF STATE GOVERNMENT: DETAILED IMPLEMENTATION

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, I, Bill Ritter, Jr., Governor of the State of Colorado, hereby issue this Executive Order to establish policies and procedures to achieve the goals and objectives articulated in Executive Order D0011 07 and designed to reduce the environmental impact of state government.

1. Purpose

This order provides direction to the Governor's Energy Office ("GEO"), the Greening of State Government Coordinating Council ("Council"), and state departments and agencies regarding the implementation of Executive Order D 011 07, which establishes goals and objectives for the Greening of State Government. In addition, this order directs the GEO to develop sustainability standards for state facility leases.

This Executive Order modifies but does not replace Executive Order D 005 05. The Greening of State Government Coordinating Council ("Greening Council") formed pursuant to Executive Order D 005 05, shall continue under the lead of the Governor's Governor's Energy Office (GEO). This order is to be read in conjunction with Executive Orders D 005 05 and D 0011 07.

2. Directive

A. Reduction of State Energy Consumption

Executive Order D011 07 orders the Manager and Council to work with state agencies and departments to reduce overall energy use in all state facilities by 20% or more no later than the end of fiscal year 2011-2012 and to determine feasibility of energy performance contracting. State energy use in fiscal year 2005-2006 will constitute the baseline for all comparisons. To that end, I direct that:

1. The Greening Government Manager will be responsible for ensuring that all agencies and departments that have not yet developed an energy management plan and engaged in energy efficiency upgrades will, by January 2008, have a plan to do so.
2. For all state-owned facilities that have not yet engaged in performance contracting, as defined in Executive Order D 014 03 (Energy Performance Contracting to Improve State Facilities), the Greening Government Manager will facilitate performance of a feasibility study pursuant to the policies established in Executive Order D014 03. Where performance contracting is feasible, viable, and economically sound, those facilities shall engage in such contracts on a recommissioning basis. With assistance from the Office of State Planning and Budgeting (OSPB), the Greening Council shall develop standards defining whether such projects are "feasible, viable, and economically sound." The State's public higher education facilities are expected to follow these requirements to the greatest extent practicable.

3. From time to time, the Greening Government Manager, working with department energy managers, shall repeat these feasibility studies to determine if further efficiency gains are feasible.
4. Where performance contracting is not feasible, state agencies shall strive to reduce energy use by 10% from a fiscal year 2005-2006 baseline. State agencies shall make every effort to meet or exceed this goal no later than the end of fiscal year 2011-2012.
5. I hereby direct each agency and department to designate an energy management liaison. The GEO will assist in the training of all department energy management officers and in the implementation of best energy management practices.

B. Materials Management, Environmentally Preferable Purchasing, and Resource Management

Executive Order D011 07 establishes specific goals and objectives for reducing the impact of state materials and resource management decisions. In order to further achievement of these goals, I hereby direct all departments and agencies to develop and implement materials management, purchasing, and resource management policies that minimize the impact on public health, the environment and natural resources and reduce state government expenditures. To that end, I order that:

1. All agencies and departments shall work with the Greening Council to adopt a goal of “zero waste” from construction of new buildings and operation and renovation of existing facilities through re-use, reduction, recycling, and composting of waste streams.
2. All agencies and departments shall develop and implement strategies that minimize the public health and environmental impacts associated with agency land use and acquisition, construction, facility management, and employee transportation.
3. DPA, in cooperation with DPHE, shall develop purchasing policies for selecting environmentally preferable products. The policies shall:
 - a. Be implemented by all state departments and agencies, and shall give preference to products that minimize environmental impacts over the lifetime of the product. At a minimum, the policy should consider a product’s energy profile and recycled material content, toxicity, and impact on air and water resources.
 - b. Require that each agency and department purchase equipment certified as Energy Star®-qualified where such equipment is available. Where such equipment is purchased, the energy savings features shall be utilized. DPA is authorized to provide a waiver for this requirement if Energy Star®- certified equipment is not available, appropriate, or cost-effective. DPA shall modify its Request for Bids to specify Energy Star®-compliant equipment.

- c. Policies regarding the purchase of electronic equipment shall require consideration of the life-cycle environmental and energy impacts of that equipment
 - d. The policies developed shall take into account the primary purpose of the products procured, and, for safety-critical products, shall ensure that public safety is not compromised.
4. The Greening Council, working with the Greening Government Manager, shall develop sustainability standards for new leases of state facilities. These standards shall address, at a minimum, energy efficiency, water conservation, recycling, and access to public transportation.

C. Greening of State Fleet Management

I hereby direct all state departments and agencies to take all reasonable actions to achieve, by June 30, 2012, a 25% volumetric reduction in petroleum consumption by state vehicles measured against a fiscal year 2005-2006 baseline. For the purposes of this Executive Order and of Executive Order D 011 07, "state vehicles" include vehicles managed by the Department of Personnel and the Colorado Department of Transportation (CDOT). The baseline should exclude vehicles used for law enforcement, emergency response, road maintenance, and highway construction. To that end, I order that:

1. State departments and agencies shall aggressively pursue achievement of this standard using all necessary strategies and initiatives, including:
 - a. Restricting the purchase of four-wheel drive sport utility vehicles, except where necessary for law enforcement, emergency response, highway maintenance and construction or use in difficult terrain.
 - b. Giving priority to replacement of pre-1996 light duty vehicles that have a city fuel efficiency rating of less than 25 miles per gallon.
 - c. Acquiring hybrid gas/electric high efficiency vehicles, alternative and flex fuel vehicles, and other fuel efficient/low emission vehicles whenever practicable.
2. State agencies and departments shall report back to the Greening Council on an annual basis regarding the progress made towards achieving the goal of reducing petroleum consumption.
3. The Greening Council shall develop an education plan for state employees that includes the labeling of state-owned flexible fuel vehicles and provision of information about the location of flex-fuel stations so that ethanol blended and bio-diesel fuels can be used whenever possible. The Department of Agriculture shall purchase Flex Fuel Vehicles whenever practicable.

4. The DPA will explore aggregate purchasing strategies among contiguous western states for future purchases of hybrid gas/electric, alternative fuel and flex-fuel technology vehicles.
5. State agencies shall use, when available, a minimum of 20% bio-diesel blend for diesel burning vehicles.
6. State agencies using flex-fuel vehicles or diesel vehicles shall track the fuel type purchased and report fuel consumption annually to the Greening Council for review. Departments shall adopt a goal of fueling flex fuel and diesel vehicles a minimum of 50% of the time with alternative fuels.
7. The DPA, in conjunction with GEO and DPHE, shall conduct a transportation efficiency audit, to be completed by December 1, 2007, to evaluate current state practices and make recommendations regarding:
 - a. Appropriate vehicle utilization rate and size of agency fleets;
 - b. Appropriate age and mileage for vehicle turnover to maximize performance and minimize maintenance costs and environmental impact;
 - c. Environmental costs and benefits of personal vehicle use and reimbursement policies;
 - d. Strategies for improving the overall efficiency of acquiring, using and maintaining all vehicles in the state fleet;
 - e. Cost effectiveness of car-sharing services;
 - f. Increasing opportunities for employee use of ride-sharing and mass transit on business travel, and
 - g. Exploration of support for employee transit options. As part of this process, the Greening Council shall work with DPA to evaluate the state fleet and develop suggestions regarding how to increase average fuel efficiency and use of alternative fuels in state vehicles. The Council shall present the results of this study to the Governor by December 1, 2007.
8. When traveling on state business, all state employees shall give preference to major airports that are physically closest to the destination, with preference given to airports that are served by a mass transit system unless such option is not cost effective. Employees shall use mass-transit when traveling whenever feasible.

D. Renewable Energy Sources for State Energy Consumption

This section implements Executive Order D011 07's mandate that the Manager and Council work with GEO to support development of state renewable energy projects. To that end, I hereby direct GEO to implement a renewable energy outreach program for state agencies and departments to achieve the following goals:

1. Providing technical support for the use of direct renewable energy applications, such as wind, biomass, geothermal, and solar, on state facilities; and
2. Exploring funding for and feasibility of state-run renewable energy projects to provide energy to state facilities.

4. Duration

This Executive Order shall remain in force until further modification or rescission by the Governor.

GIVEN under my hand and the
Executive Seal of the State
of Colorado, this 16th day of
April 2007.

Bill Ritter, Jr.
Governor

**APPENDIX C STATE OF COLORADO GREENING
GOVERNMENT PLANNING AND
IMPLEMENTATION GUIDE**

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Introduction and Background - Section 1

Using the Planning and Implementation Guide

The Guide is designed to help agencies understand the environmental and public health impacts of their day-to-day decisions and actions, and is intended to provide agencies with broad-based goals and specific actions that they can take to initiate greening government efforts, while still providing necessary services and ensuring efficient and effective operations.

It is important to note that many of the strategies and actions recommended in the Guide can be implemented at little or no additional cost to an agency, while using existing staff and resources. Additionally, other strategies and actions that may have an upfront cost often reduce the operational costs of an agency, resulting in overall savings within a short time frame. When prioritizing strategies and actions for implementation, agencies should take into account the over-all cost of each activity and initially select those based on the best payback period, potential environmental impacts and ease of implementation.

This Guide is a living document and will be updated periodically by the State Greening Government Administrative Committee, either to provide up to date information for existing sections or add new sections on new topics. New sections will be posted on the State website, www.colorado.gov/greeninggovernment.

This Guide consists of three primary sections:

1. Introduction and Background – information on environmental issues of concern, sustainability principles and the rationale for establishing a state greening government program.
2. Greening Government Area Program Guidance – Five topics describing specific environmental impacts and issues associated with human activity, long-term goals for state government, and specific strategies and action steps that agencies should take, where appropriate, to achieve environmental and economic improvements. The topics include:
 - Energy Efficiency
 - Water Conservation and Quality
 - Waste Reduction and Recycling
 - Environmental Preferable Purchasing
 - Transportation
3. Agency Greening Government Planning – a step-by-step guide to help agencies initiate and manage greening government plans and implement internal greening government programs.

Agencies should use the Guide to help them develop greening government efforts and plans, but should also incorporate their own ideas into their programs. It is critical that agencies establish an ongoing process through which their efforts can be reviewed and improved upon.

Environmental Concerns – Background

It is becoming increasingly clear that our society faces many environmental issues locally, regionally, nationally and even globally. From concerns over climate change, to drought-related water shortages, to air quality in cities and towns, it is clear that environmental issues affect the quality of life in our communities and around the country.

Global Issues

- Sea level has risen 4 to 8 inches over the past century.
- The last ten years (1996-2005), with the exception of 1996, are the warmest years on record.
- A federal study released in 2005 by the National Center for Atmospheric Research stated that climate change could thaw the top 11 feet of permafrost in most areas of the Northern Hemisphere by 2100, altering ecosystems across Alaska, Canada and Russia.

Regional Issues

- Tight water supplies in the west will continue to challenge communities in the region who are in competition for water for their residents, industry and agriculture.
- Noxious weeds and invasive plant species pose an increasing threat to native ecosystems, croplands, and other plant communities throughout the United States. On Federal lands in the Western United States, it is estimated that weeds occur on more than 17 million acres, with similar infestations occurring in Canada and Mexico. (USFS)
- Americans generate over 230 million tons of waste per year, about 4.5 pounds per person per day, up from 2.7 pounds per person in 1960. (EPA)

Local Issues

- Colorado residents generate about 6.1 pounds of waste per person per day, almost 2 pounds higher than the national average.
- Colorado's Fraser River is listed on American Rivers' top 10 endangered rivers in the country. Denver Water currently takes 65% of the water from the Fraser and has plans to increase the rate to 85% so it can feed the growth of Colorado's Front Range communities.

State Government Scope and Impacts

By its very nature, the activities of state government in Colorado are varied and far-reaching. From provision of medical care and higher education, to operation of parks and recreation areas, to road and building maintenance, Colorado agencies are involved in numerous activities ranging from purchasing, waste management, and building and operations, all of which consume resources and impact our environment. In addition to these operational activities, the state manages millions of dollars of road construction each year.

As one of the largest employers in the state, government is responsible for overseeing:

- Over 60 million square feet of property
- Over 5,000 buildings
- Over 9,100 miles of highways
- 22 prison facilities with some 14,000 prisoners
- Over 5,200 light and heavy duty vehicles that travel over 72 million miles

The environmental impacts associated with the construction, maintenance and operations of these facilities are significant:

Examples of Operational Environmental Impacts

<i>Agency Activity</i>	<i>Environmental/Health Impacts</i>
Energy consumption to heat and cool buildings and power appliances and equipment. Fuel for vehicles.	Greenhouse gas emissions and other air emissions that effect air quality
Day-to-day operations and public activities on state land, from office operations to state parks	Solid waste generation, incineration emissions, mercury emissions, open space for landfills.
Operation of labs, medical facilities, vehicle maintenance and print shops	Hazardous waste generation, indoor air quality
Water consumption for drinking, washing, and landscape management	Ecosystem and habitat impacts, water quantity and quality
Pest management in state buildings and along roadways to control insects, vermin and weeds	Ecosystem impacts, water quality and indoor air quality

While specific data on actual environmental impacts from state government activities are still being collected, information gathered so far demonstrates that state government impacts are significant and that government efforts can play a key role in statewide efforts to reduce environmental and health effects. In fiscal year 2005, state agencies were responsible for:

- Traveling over 72 million miles in state vehicles
- Burning over 4.2 million gallons of fuel, this equates to releasing over 4,200 tons of Carbon dioxide into the atmosphere.

In addition to the environmental impacts associated with the above activities, Colorado state agencies spend millions of dollars per year on the day-to-day management of their facilities. In fiscal year 2005, agencies spent the following:

<i>Amount Spent</i>	<i>Operational Activity</i>
\$38,000,000	Electricity
\$8,322,800	Vehicle Fuels
\$10,440,000	Water and Sewer Costs

Colorado State Greening Government Coordinating Council

In recognition of state government's environmental impact and its potential to address a number of environmental concerns, Executive Order D 005 05 established the State Greening Government Coordinating Council in July 2005. The Order calls on all state agencies to "develop and implement policies and procedures to promote environmentally sustainable and economically efficient practices".

The Greening of State Government Executive Order focuses on state agency operations and activities in order to:

- Address the environmental and health impacts associated with agency activities
- Make government more efficient and reduce operating costs
- Incorporate long-range environmental planning into day-to-day operations
- Establish state government as a model for other sectors
- Help ensure that future generations of Colorado citizens enjoy a quality of life at least as high as today's

A State Greening Government Administrative Committee, made up of representatives from the Office of Energy Management and Conservation, Colorado Department of Public Health and Environment and Colorado Department of Personnel and Administration, directs the program and coordinates efforts with all agencies. The Council meets regularly to review recommendations from the Steering Committee on the five greening government program areas, and decides on priority activities that state agencies should be taking for improving the environment and saving state funds. Each member of the Council will have a greening government team at their agency that will help in the implementation of agreed upon projects. For more information on Greening Government, go to: www.colorado.gov/greeninggovernment.

Defining Sustainability

It is important that state agencies understand how greening government activities will lead to a long-term goal of having a sustainable Colorado and that agencies have a common understanding of what sustainability means.

Sustainability has many definitions but the most commonly accepted definition comes from the 1987 World Commission on Environment and Development Brundtland Report:

Meeting the needs of the present generation without compromising the ability of future generations to meet their needs.

While working to achieve a sustainable Colorado through greening government activities, agencies need to think about their activities with the context of the following long-term goals and principles:

Using Resources and Materials Efficiently and Wisely

- Produce electricity from renewable sources
- Ensure that buildings and vehicles are the most efficient possible
- Recycle the majority of solid waste and minimize total waste generated
- Generate virtually no hazardous waste
- Ensure that local water bodies and water supplies remain of high quality and are not depleted beyond nature's ability to manage and replenish ecosystems

Using Purchasing Power to Protect the Environment

- Buy products that do not contain mercury or other persistent bio-accumulative toxins (PBT's) e.g. lead, mercury, PCB's and dioxin
- Ensure that new, and renovated buildings and roadways are constructed in ways that minimize impacts on the surrounding environment
- Make purchasing, management, and operational decisions based on life-cycle costs that incorporate the true environmental costs as well as short-term and long-term economic impacts

Promoting Sustainable Decision Making Processes

- Make staff aware of environmental and health issues as part of their normal routines
- Ensure that long-term environmental, health, and economic impacts are incorporated into decision making-processes

Greening Government Area Guidance - Section 2

Introduction

The areas in which state agencies can implement greening government practices are many and varied. From the water and energy consumed, to the solid waste generated, and the type of vehicles we drive for work, day-to-day government operations have an impact on the local, regional and even global environments. This section provides information and potential actions in five key environmental areas.

While these areas are not meant to be exhaustive of all the possible environmental and economic impacts associated with government activities, the Greening Government Steering Committee has chosen them as priority areas where impacts are significant and possible actions can be quickly implemented. The agency strategies and action steps listed in this section are meant to guide agencies, however, agencies should use their own planning process to develop additional priority actions relevant to their own activities and operations.

Each program area (energy efficiency, water conservation/quality, waste reduction and recycling, environmental preferable purchasing and transportation) is broken into four sections as follows:

1. Introduction and Background
2. Environmental and Economic Benefits
3. Existing Efforts
4. Goals, Strategies (Statewide and Agency specific), and Action Steps

Sections 1 through 3 are designed to provide background on the issues, information on the associated health and environmental impacts, and a summary of possible benefits resulting from improved performance. Section 4 consists of several components, which include:

- Statewide strategies that will help agencies in their efforts
- Agency strategies that may necessitate a change in agency policy or management practices
- Specific action steps that agency staff can use over the short term to begin implementing greening government practices quickly, often at little or no cost.

Not all of the strategies or actions listed will be appropriate for all agencies – for example, a small satellite office renting space should not focus on building energy efficiency efforts, nor should a vehicle maintenance garage focus on paper recycling. However, all agencies should at least consider each suggestion carefully to determine which ones are applicable and feasible. While each program area has its own issues and strategies, agencies should make sure to address environmental and health impacts as well as cost savings strategies in a coordinated fashion. For example, it does not make sense to eliminate one type of toxic waste only to generate another, or to promote energy

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conservation at the expense of indoor air quality. All of these issues should be considered within a broader environmental and planning context.

While the list of issues and action may seem overwhelming, it is important to remember that achieving a sustainable government is a long-term goal that relies on continual improvement in how agencies conduct their day-to-day activities. Agencies should identify their most significant environmental and health impacts, examine the feasibility and cost-effectiveness of addressing these impacts, and prioritize their actions accordingly.

Program Area 1: Energy Efficiency

I. Introduction and Background

Technological advances in all types of energy-using equipment, from motors to boilers to lights, enable the equipment to perform while using less energy. One stellar example of this is the compact fluorescent lightbulb which can deliver the same amount of light as the conventional incandescent bulb while using 75% less energy, and it lasts 10 times longer so easily pays for itself in the first year of its lifetime then keeps on saving for the remaining years.

Buildings represent the main energy-user in state government so the recommendations below are directed toward new and existing buildings as well as grounds.

II. Environmental and Economic Benefits

Reducing energy use provides many economic, environmental and other benefits.

Cost savings of 25 percent can often be achieved by implementing cost-effective equipment replacements and operational strategies. This goes right to the bottom-line of state department utility budgets and enables the state to re-direct funds that otherwise are paid to utility companies. Reducing energy costs also mitigates the future impact of volatile energy prices and fuel price escalation. The state uses \$38 million in energy per year (2004-05 figures for state departments), so a 25% reduction will save \$9.5 million per year in funds that can be freed-up to meet other budget needs. In fact, the savings can be used to pay for the projects through an innovative approach called performance contracting, where annual savings are guaranteed to meet the finance payments within the lifetime of the equipment. The State has already taken significant steps in this direction, particularly under Executive Order D 014 03, Energy Performance Contracting to Improve State Facilities, which requires state departments to initiate performance contracts as feasible.

There are many opportunities for increased efficiency in new buildings, where a 30% reduction in energy costs can result from better design without expanding the design/construction budget.

Reducing energy use also goes to the environmental bottom line, reducing the demand on our natural resources for fuel supplies. These energy savings improve air quality by reducing air emissions from electrical power plants and on-site fuel combustion. A 25% reduction in energy use is the pollution-prevention equivalent of taking 11,000 cars off the road each year.

Economic benefits also result. Besides cutting utility costs, implementing energy-saving projects is a boon to the Colorado economy. For each \$1 in performance contracting projects, \$0.40 is pumped into the local economy according to the National Association of Energy Service Companies, 2003. Also, several studies suggest that four to five jobs are created for every \$1 million in energy investment.

The quality of energy efficient equipment and the effective operation results in improved comfort in the buildings for occupants – better lighting, better temperature control, adequate fresh air, reduced noise from equipment operation, etc. Studies show this improves worker productivity and attendance.

III. Existing Energy Efficiency Efforts

- The Department of Corrections through its Energy Management Program avoids \$1.8 million in annual costs (10 percent of its utility budget) and is planning additional facility improvements that could result in avoided annual costs exceeding \$1 million.
- The Department of Human Services through its aggressive program to manage its \$5.3 million annual utility budget achieved a 10 percent level of cost avoidance.
- The Department of Human Services is also in the construction phase of a performance contract that will avoid an additional \$1,000,000 in annual utility costs.
- The Department of Personnel and Administration, with the Judicial Department and the Department of Labor & Employment, is using performance contracting for a large-scale, comprehensive project that captures \$700,000 in annual reductions to pay for \$14 million in facility upgrades.
- The Department of Military Affairs is demonstrating how re-commissioning (technical building tune-up) can improve the efficiency of four of its facilities.

IV. Energy Efficiency Statewide Strategies

- The Energy Efficiency Subcommittee should provide information resources to agencies to help the identify, assess, and implement energy conservation opportunities – such resources/tools include:
 - Websites
 - Guides and fact sheets
 - Technical support from OEMC.

V. Energy Efficiency Strategies

To help reach energy efficiency goals, agencies should:

- Contact OEMC to get technical assistance in identifying and implementing cost-effective approaches, and utilizing innovative financing approaches with available utility rebates to pay for the projects.
- Use performance contracting to initiate and implement large-scale, comprehensive energy-saving projects in all your facilities.
- Adopt the United States Green Buildings Council's Leadership in Energy and Environmental Design Green Building Rating System for Existing Buildings (LEED-EB) in operating, maintaining and managing existing buildings, to the extent applicable and practicable.
- Incorporate LEED for New Construction (LEED-NC) practices to design energy and resource efficient new buildings, to the extent that this is deemed cost-effective.
- Require commissioning to ensure new construction projects function as designed.
- Initiate an energy management program to monitor and manage utility usage and costs, as resources become available. The first step is to collect gas and electricity data. OEMC intends to launch a program to aid departments in this effort in Fall 2006.

Action steps for energy efficiency opportunities

- Turn off lights in offices, conference rooms, kitchens, etc., install motion detectors in rooms that are not used regularly.
- Replace inefficient incandescent lights with more efficient alternatives, such as
 - LED exit signs: Replacing one incandescent sign can save 20-30 watts.
 - Compact fluorescent lamps (CFL): Replacing a 100-watt incandescent lamp with a 27-watt CFL saves over \$60 over the life of the bulb.
- Install vending misers on soda machines: Installing a motion sensing vending miser will save over 40% in energy cost, de-lamping the soda machine can save an additional 20% for a total of 60% savings without losing any performance on the machine.
- Use your sleep setting on your computer. Set your monitor to go to sleep if it is not being used for over 20 minutes, monitors typically use over half the energy in your computer system.

- Consider replacing your old CRT monitor with a new LCD monitor. LCD's use about a quarter the energy, have much less toxic material in them, and last longer than a CRT.
- Operate equipment only when needed: Perform night and weekend audits to discover what equipment is operating that could be turned off (e.g., bathroom lights, desk lights, fans, printers, copiers, etc.).

Program Area 2: Water Conservation and Water Quality

I. Introduction and Background

Water is consumed by all sectors of society, from agriculture, to industry, to commercial and residential communities. It is used to sustain human life, grow plants, wash our bodies, cars, and buildings, sustain our landscapes, and keep machinery running. Though 70% of the earth is made up of water, only 1% of this water is fresh and available for consumption. The consumption of water continues to grow at a surprising rate—during the 20th century, global demand for water increased six-fold, double the rate of population growth.

Water is obviously a precious resource in the arid west. Not only do we consume water, but in the use of water we also create water pollution that must be treated before it can be reintroduced into the natural water system. As was evident over the recent past, Coloradoans are becoming more aware of the need to protect and conserve our water resources for the sustainability of our ecological systems, agricultural industry, tourism, and quality of life in Colorado.

Activities by state agencies use significant amounts of water throughout the state. Drinking water and washroom water is consumed by tens of thousands of employees, clients, visitors, and patients every day. Outdoor use of water for landscaping at thousands of state buildings, parks, athletic fields, and golf courses also contributes to significant water usage.

II. Environmental and Economic Benefits

Reducing our water consumption and minimizing our impacts to water quality, provides both economic and environmental benefits for Colorado and state agencies. Governor Owens a few years ago asked state agencies to review water usage and find ways to reduce consumption rates. Conservation of water through the use of more efficient equipment, changes in behavior, and improved maintenance has the potential to save significant environmental and fiscal resources. The US Environmental Protection Agency estimates that through the installation of water efficient equipment and integration of water efficient practices into everyday operation, a 30% reduction in water consumption is possible. Payback periods for implementing water demand reduction measures at institutional, industrial, and commercial facilities are generally low, between 1-4 years, with an average payback period of less than 2.5 years. There are also secondary cost benefits to conserving water, such as reductions in energy use to heat water and reductions in costs to treat and dispose of water.

A water conservation and quality improvement program can:

- Reduce energy usage for treatment of wastewater;

- Reduce the need for chemical treatment for a cooling towers;
- Possibly reduce capital costs to the extent that new infrastructure to meet future needs is deferred, eliminated, or reduced;
- Protect the health of water bodies, wildlife, and habitats in Colorado;
- Result in changing design plans for development or redevelopment projects;
- Minimize stormwater runoff from development projects carrying elevated pollutant concentrations and loadings that can infiltrate groundwater or spill into surface waters.

III. Existing Water Conservation and Water Quality Efforts

- The State Laboratory has installed motion sensors for all of its restroom hand sinks.
- The State Laboratory has begun to convert their landscaping from Kentucky Bluegrass to native plants and ground cover such as Blue Grama grass and woodchips.
- CDPHE has install flow restrictors on all toilets to reduce the amount of water used during each flush.

IV. Water Conservation and Water Quality Statewide Strategies

- The Water Conservation and Quality Subcommittee should provide information resources to agencies to help the identify, assess, and implement water conservation and water quality opportunities – such resources/tools include:
 - Websites such as www.ourwater.org and www.greenco.org
 - Guides and fact sheets
 - Water conservation resources
 - Water audit checklists and guidelines (Denver Water will audit customers for free).
- The Water Conservation and Quality Subcommittee should work with the Department of Personnel and Administration to identify and offer water-efficient equipment and appliances on relevant state contracts, and should provide employee outreach to educate employees on all available water saving alternatives.

V. Water Conservation and Water Quality Agency Strategies

To help reach water conservation and water quality goals, agencies should:

- Use existing data (water/sewer bills) to prepare a summary of the volume and cost of water being consumed and to look for trends, patterns, and unexplained increases that could indicate leaks or inefficient use of water.
- Conduct water audits in large facilities or facilities with high outdoor water use – audits may be conducted by Denver Water or by hiring a consultant to identify measures where the greatest efficiencies and potential savings can be realized.
- Estimate cost and water savings for potential conservation measures, to prioritize projects' cost effectiveness.
- Replace plumbing fixtures that do not meet the following criteria:
 - Toilets: 1.6 gallon per flush
 - Urinals: 1.0 gallons per flush or try installing waterless urinals
 - Lavatory faucets: Low flow faucet aerators 1.0 gallons per minute
 - Shower heads: Low flow 2.5 gallons per minute
- Gradually phase out high water use landscapes at state run facilities. Change over to xeriscape plants such as Blue Grama Grass and Fine Fescues. For a great resource visit the Colorado State Cooperative Extension at: <http://www.ext.colostate.edu/menuwater.html>
- Minimize the amount of fertilizers applied to landscaping. Excess fertilizer will run off into state waterbodies.
- Be a creek steward. Have your agency adopt a stretch of creek and commit to cleaning up debris from it at least 2 times per year.
- Stencil around storm drains so people are aware that the water that enters this drain goes directly to waterways without being treated.

Action steps for water quality and water conservation improvements

A variety of short-term actions state facilities can take to reduce their environmental impacts.

- Implement a water conservation awareness and outreach program
 - Solicit employee ideas through surveys or suggestion boxes.
 - Place stickers in restrooms encouraging water conservation
 - Have employees use water conservation and water quality training modules available at www.co.train.org
 - Highlight water conservation measures for employees and general public
- Reduce non-essential water uses, especially during periods of drought. Non-essential water uses include, but are not limited to: vehicle washing (unless necessary for operator safety), decorative fountains that do not re-circulate water, routine watering of athletic fields and other identified by specific agency.
- Routinely inspect and repair any leaking water lines as well as pumps, valves and faucets.
- Focus on restroom water use, which is often up to 50% of water demand at institutions:
 - Replace old toilets that use 3.5 to 5.0 gallons per flush with 1.6 gpf units.
 - Install water saving aerators on faucets and other plumbing fixtures.
 - Check system pressure and install pressure-reducing valves to reduce water consumption.
- Limit lawn watering to hours when evaporation is lowest – early in the morning or later in the evening to maximize absorption and minimize evaporation.
- Plant drought tolerant native plants and grasses in existing landscapes to reduce irrigation needs.
- Eliminate once-through cooling systems.
- Don't wash lawn clippings or leaves down storm drains. Yard waste can clog storm sewers as well as add excess organic matter to local water resources.
- Consider hand pulling of weeds, especially before seeds are produced. This will keep chemical pesticides out of stormwater.

Program Area 3: Waste Reduction and Recycling

I. Introduction and Background

Nearly everything we do creates some type of waste. Waste can be considered lost resources, and in today's world of ever decreasing natural resources we must find ways to decrease our waste generation in order to become a more sustainable society.

In 2004, residents of Colorado generated over 7.5 million tons of solid waste, an increase of approximately 60% from 1995. The Environmental Protection Agency estimates that each Coloradan generates 6.1 pounds of waste per person per day and that the national average for waste generation is 4.5 pounds per person per day. As you can see, Colorado is behind the national average and has many opportunities for improvement. One of the reasons for Colorado having a higher waste generation rate is the fact that we have some of the lowest solid waste tipping fees in the country. Colorado's tipping fees are 3 to 4 times less than those in the northeast and Atlantic coast and in turn this creates a greater challenge for waste reduction and recycling due to economic factors.

With thousands of employees in state government, and facilities that service hundreds of thousands of customers, state operations generate thousands of tons of waste every year. It is the responsibility of the state to take a leadership role in reducing the amount of waste we generate and to increase the amount of material we recycle in an efficient, economical way.

II. Environmental and Economic Benefits

Reducing our waste, and recycling what waste we do generate, provides both economic and environmental benefits for Colorado and state agencies. A strong waste reduction and recycling program can:

- Reduce the extraction of natural resources and minimize the associated environmental impacts – Waste prevention and recycling of paper products allow more trees to remain standing in the forest, where they can continue to remove carbon dioxide from the atmosphere.
- Save energy and water through the utilization of recycled materials in manufacturing processes – Recycling one aluminum can saves enough energy to power the average TV for 3 hours.
- Preserve open space by eliminating the need for more disposal capacity and save local governments money by reducing the need to construct more sanitary landfills.
- Protect air and water resources by reducing emissions from the generation of landfill gas, minimize surface water run-off, and reducing generation of leachate which must be managed and treated from landfills.

- Save money through the reduction of unnecessary equipment and supply purchases by re-using existing supplies.

By implementing successful waste prevention programs, agencies can avoid disposal costs altogether (leasing rather than purchasing equipment). A comprehensive prevention program can also benefit from cost savings associated with not purchasing a product in the first place. The Colorado Department of Public Health and Environment recently reduced the number of copiers they were leasing from 31 to 28 saving approximately \$13,000 per year in the process. Waste management contracts can also be restructured to include more recycling services; many times this will reduce the amount state agencies pay for waste disposal.

III. Existing Waste Reduction/Recycling Efforts

- The Colorado Department of Public Health and Environment currently recycles the following materials: Glass, Aluminum, Plastic #1 and #2, Newspaper, Magazines, Office Paper, Phonebooks, Cardboard, Paperboard, Junkmail, Batteries and Cell Phones.

IV. Waste Reduction/ Recycling Statewide Strategies

- The Waste Reduction/Recycling Subcommittee should compile relevant resources to assist agencies in developing waste reduction programs including:
 - Case studies and fact sheets on waste reduction/recycling
 - Sample policies and programs
 - Educational Materials
 - List of resources to assist with waste reduction/recycling programs
 - Technical assistance and incentives
 - Model recycling specifications for contracts and lease agreements
- The Department of Personnel and Administration should disseminate information about any recycling/solid waste contracts that may be accessed to assist and improve agency waste reduction programs.
- The Department of Personnel and Administration should work with the Waste Reduction/Recycling Subcommittee to ensure that reporting requirements for vendors are included on statewide recycling/solid waste contracts. This will help agencies with tracking and reporting solid waste and recycling numbers.

Greening Government Planning Road Map

- 
1. **Form Greening Government Team, Assess Operations and Environmental Impacts (At agency level – Internal team)**
 - Establish greening government team
 - Identify significant environmental impacts
 - Gather baseline data (Can be project specific)
 2. **Broadly Define Long-Term Goals**
 - Brainstorm vision of long-term goals (what would a sustainable/green agency look like?)
 3. **Identify and Prioritize Short-Term Actions (Implement)**
 - Identify and prioritize action steps
 - Identify appropriate training and education needs
 4. **Develop Management Systems and Integrate Greening Government Into Decision Making**
 - Ensure controls are in place to implement strategies
 - Ask the right questions when decisions get made that affect environmental impacts
 5. **Track and Report on Progress (Measure and Report)**
 - Track results of efforts and compare to baselines
 - Report progress to own staff
 - Submit annual reports to Coordinating Committee

Review to pursue continuous improvement

Agency Sustainability Plans

The questions and discussions facilitated by the 5-step road map closely follow the format of the Agency Greening Government Plan template, which was developed as guidance for agencies when writing their Greening Government Plans.

Road Map Step 1 – Form Greening Government Team and Assess Operations and Environmental Impacts

A. Create a Greening Government Team

Before taking concrete steps to develop agency-wide greening government actions, agencies should establish a Greening Government Team (Team). A Team that includes employees most familiar with major agency operations can provide an effective means to identify sustainable actions the agency may want to pursue, develop a strategy to implement such actions, and effectively communicate greening government goals to the entire agency.

- a. Which job roles most affect agency operations that have a direct environmental impact?
- b. Who needs to participate on the Team to ensure action plans are implemented?
- c. Which staff has the resources to participate on the Team?

The appropriate number of people on the Team will depend on the number of agency facilities and complexity of agency operations.

Possible Staff Functions to Include on an Agency Greening Government Team

- Purchasing
- Operations/Facilities
- Fiscal
- Environmental/Health and Safety
- Management/Planning
- Information Technology

Once you have identified the key employees to be part of the Team, work with top-level agency management to authorize/request people to participate. Where possible, offer incentives for participation (PPAB Environmental Awards, P2 Champions, etc.) and make sure to provide a clear definition of the goals, responsibilities, and time commitments.

B. Assess Operations and Identify Environmental Impacts

The first step for the Team is to identify and describe key operations, the activities related to these operations, and the broad environmental impacts associated with these activities:

Identify the major operations the agency carries out and the activities involved, for example:

- Maintaining roads– driving vehicles, procuring road materials, de-icing
- Processing tax returns – paper use, copying, printing

- Housing students or inmates – heating and cooling, food preparation, laundry

Conduct a quick inventory of the environmental impacts associated with the activities listed above, for example:

- Energy/fuel use associated with vehicles, heating and cooling buildings, computer use – Air emissions, GHG's, waste vehicle fluids, etc.
- Chemical generation associated with product purchases (e.g. mercury thermometers), use of pesticides for landscaping and cleaning chemicals
- Resource use associated with consumption of paper, water and food
- Land impacts related to where buildings are situated, wastes disposed, etc.

Select a range of issues to focus on based on which of the activities the agency has direct control or influence over.

Gather agency operational baseline data on energy use (utility bills), materials consumption (purchasing records), waste generation (disposal records/fees), and other environmental impacts, wherever possible. Agencies should also work to identify the costs associated with each activity and impact. These baselines can be collected for specific projects that an agency undertakes (e.g. if you change out 100 light fixtures, give the before and after energy use for the project).

Agencies may want to use the sample chart below to help them create a broad picture of their operations, activities and associated environmental impacts.

General Operations	Activities	Energy	Chemicals	Waste	Natural Resources	Health and Environmental Impacts
Building Maintenance	Interior Cleaning		x		x	-chemicals affect water quality -indoor air quality
	Pest Control		x		x	-water quality -exposure to chemicals
Office Operations	Printing	x	x	x	x	-electricity use -paper use
	Office Equipment	x	x	x		-electricity use -air emissions -end-of-life disposal

Road Map Step 2 – Broadly Define Long-Term Goals

Creating a set of long-term goals can be helpful in stimulating ideas for action and in making decisions to prevent future problems. In light of the Step 1 findings on how the agency’s activities impact the environment, the Team should do a quick brainstorm to come up with some examples of what the agency’s operations would look like if they were sustainable. The following questioning strategy, based on sustainable principles, can encourage this creative thinking:

Environmental Impact	Long-Term Sustainable Solutions
Fossil fuel use/air pollution?	-Vehicle operate on clean, renewable fuels -Energy for building heating and cooling from renewable sources such as solar, wind and hydro power.
Persistent and toxic chemicals?	-Reduce pesticide use through integrated pest management programs -Purchase organically grown food
Consumption of resources and degradation of natural systems?	-Purchase paper with high percentage or recycle content. -Only use native plantings for lawns and grounds -Wood products from sustainably harvested forests

Once the Team has identified general long-term greening government goals, it should move to Road Map Step 3 to identify and prioritize more specific short-term actions that can be implemented.

Road Map Step 3 – Identify and Prioritize Short-Term Actions

Inevitably, there will be a gap between an agency’s current activities and impacts versus the long-term vision of how a sustainable agency should look. This step is designed to help your agency define how to close that gap over time by identifying a list of what actions it can take now to move toward the vision of a sustainable agency, thereby reducing environmental impacts and lowering operational costs.

Add ideas about the 5 chosen categories that can be used as a starting point. Have Coordinating Committee collect examples and list for reference. The Team can use these examples, as well as its own proposals, to put together a broad list of ideas that could help move the agency toward more sustainable operations.

Once the Team has brainstormed a list of potential actions, it can prioritize which actions to pursue by considering the following questions:

<i>Question</i>	<i>Yes</i>	<i>No</i>
Will the action result in environmental/health benefits?		
Are the environmental benefits significant?		
Will the action result in a cost savings over the life of the product/action?		
Are the cost savings significant?		
Will the action support progress in one or more of the Implementation Guide priority areas?		
Is the time frame and ease of implementation manageable given agency resources?		
Would this activity help to maintain compliance and meet regulatory requirements?		
Could the action reduce compliance obligations (eliminating a hazardous waste)?		
Is this issue of significant concern to employees, or those who use your services, etc?		
Does the activity have a clear educational value or provide high visibility?		

Those actions that have a “yes” answer to many or all of the questions should obviously be given highest priority. The long-term vision developed in Step 2 also should be considered as the Team selects actions. While elements of the vision may not be practical today, the Team should pursue actions that make future efforts easier to pursue (for example, design a new building’s roof angle to allow solar panels to be added later if current economics don’t make that choice viable today).

After selecting priority actions, the Team can create a greening government workplan that assigns responsibilities and due-dates for implementation. Agencies may want to use the inventory developed by the Coordinating Committee to guide them in developing their current list of priorities.

What if my agency has a small staff and only leases office space?

Examples of Actions for Small Offices in Leased Space

- Purchasing – buy recycled, remanufactured products, energy efficient office equipment
- Building contract/lease – include conditions in the lease agreement regarding recycling, non-toxic cleaners, energy efficiency, etc.
- Waste prevention – paper use reduction, double-sided copying, behavior changes to increase recycling
- Flex time – telecommuting, encourage employees to use public transit
- Energy efficiency – computer use, turn off lights, etc.
- Choice of office location – Select a site close to public transportation and other services

Planning for greening government should also be accompanied by appropriate education and training of agency employees. Training can take many forms, from a formal workshop on one or more environmental topics, to simple reminders placed around the workplace. The State Sustainability Division has developed various educational sessions that agencies can use to educate staff and promote sustainable practices. These training modules can be found at www.co.train.org.

Road Map Step 4 – Management Systems and Integrating Greening Government Into Decision Making

A. Integrating Greening Government Into Operations

While developing a greening government workplan is key, it is just as important to devise an ongoing process through which greening government priorities are actually carried out by an agency regardless of individual commitment. The Team should work with management to develop an internal system to ensure that the agency workplan is implemented throughout the agency and maintained over time.

Within each agency, choices are made by various people at certain points along the decision making process. At these key junctures, decisions can have long-term repercussions on the agency's environmental impacts. Teams should work to identify these key decision points and develop a process to ensure that environmental considerations and actions in the Plan are acknowledged and incorporated into these decision points.

The Team should consider the following questions:

1. Where are decision points that affect material/energy flows, e.g., purchasing, budget approvals, building design, etc?

2. How can we ensure greening government questions get asked when these decisions are made?
3. How can we ensure that when changes are planned that greening government issues are considered and opportunities pursued, e.g., building new building, buying new vehicles, etc?

<i>Examples of Decision Points</i>	<i>How to integrate Greening Government</i>
Purchasing – Choice of product or service purchases	<ul style="list-style-type: none"> • Incorporate EPP options into specifications, bids, RFP's. • Train employees who make purchases in environmental impacts of their choices and preferable alternatives
New construction, building modifications	<ul style="list-style-type: none"> • Select builder with LEED experience • Specify materials that meet environmental criteria
Budget meetings	<ul style="list-style-type: none"> • Incorporate criteria that requires that those requesting budget approval for new projects demonstrate that environmental impacts are considered and minimized where feasible
Facilities management	<ul style="list-style-type: none"> • Make sure solid waste contractors are asked to propose recycling options with associated cost comparisons.

B. Developing a Management System

Once key decision points have been identified, agencies should work to develop some sort of management system that allocates environmental responsibilities among its staff. Developing such a system will ensure that greening government policies and programs will be incorporated into on-going and long-term agency operations.

Given the diversity of agencies' activities and responsibilities, a greening government management system should be designed to fit the size and breadth of an agency's operations. A small office with ten employees may simply choose to develop an environmental office policy and raise environmental issues at their staff meetings, while an agency with multiple facilities and large impacts may elect to develop a more formalized system. Regardless of the type and complexity of the system chosen, it is critical that systems are formally written and approved by the Agency Director and distributed among all appropriate staff. It is also important to develop a system that remains flexible so that changes in agency structure, operations or circumstances can be easily addressed in revisions to the document.

Examples of ways to develop greening government management systems:

- Integrate environmental responsibilities into job descriptions and performance reviews

- Provide the opportunity for employee feedback to review program efforts
- Offer recognition – awards, highlight work at staff meetings
- Establish a written agency greening government policy that sets a broad vision for staff.
- Perform spot checks, e.g., is paper being recycled or is it in the regular trash?
- Incorporate environmental considerations into standard operating procedures, including education, training and information dissemination
- Ask designated individuals for periodic updates on progress

Road Map Step 5 – Track and Report on Progress

A key element of any successful greening government effort is to regularly track and report on progress in meeting greening government goals and objectives and make changes as necessary to ensure continuous improvement. The Governor’s Executive Order D005 05 requires the Coordinating Committee to submit an annual progress report of all greening government projects implemented throughout the year and their environmental and economic benefits.

Agency Tracking and Reporting Form

The Coordinating Committee has developed an *Agency Tracking and Reporting Form* that will be issued each year by the Committee, and should be used by agencies to describe and account for their impacts and greening government efforts on an annual basis. The form requests information on the five greening government program areas:

- Energy Efficiency
- Water Conservation/Quality
- Waste Reduction and Recycling
- Environmental Preferable Purchasing
- Transportation

Data and information generated from the form will be compiled into the annual *State Greening Government Report* to the Governor, as required by Executive Order D005 05.

Continuous Improvement

In addition to this annual tracking, agencies should conduct their own review of their sustainability program. An annual review will provide agencies with an opportunity to step back and consider how well the greening government program is working. Key questions the Team should consider are:

- How effectively are we performing against our goals and targets?
- If our performance is not meeting expectation:
 - What is the problem e.g., resources, training, failed to revise plans when change occurred, etc?

- What steps would prevent this problem in the future?
- Is our management system effective?
 - Are we catching mistakes before they become big problems?
 - Are we adapting to change effectively?
- What are upcoming changes that may affect what we need to manage, such as new environmental regulations, changes in our operations, budgets, etc.
- What can we do to ensure continuous improvement?

Conclusion

Achieving a more sustainable agency through greening government may seem overwhelming, especially to those who have had little or no experience with the concept. Devising, implementing and evaluating greening government efforts, however, do not need to take an extensive amount of time or resources. Rather, agency greening government practices can be implemented through a simple step-by-step process that each agency can customize according to its own scope, abilities, resources and impacts. Agencies can rely on a wealth of existing information and resources that are available to them through the Greening Government Coordinating Committee.

At a minimum, agencies should strive to incorporate some of the key questions and environmental issues discussed in the Guide into their decision-making processes to ensure that significant impacts are addressed. Additionally, agencies can focus on those issues that have clear economic benefit and that are manageable given existing resources. Agencies should never lose sight of long-term greening government goals and remember that a more sustainable state government will result from new ideas and inclusion of staff at all levels.

Through changes in daily operations, ongoing programs, and long-range planning, state agencies can have a significant positive impact on the environment, economic efficiency of state government and the character of Colorado's communities.

Appendix I – State Greening Government Coordinating Council

Members appointed through Executive Order D 005 05:

- | | |
|--|---------|
| 1. Department of Personnel and Administration | (DPA) |
| 2. Department of Public Health and Environment | (CDPHE) |
| 3. Office of Energy Management and Conservation | (OEMC) |
| 4. Department of Labor and Employment | (CDLE) |
| 5. Department of Human Services | (DHS) |
| 6. Department of Agriculture | (DOA) |
| 7. Department of Transportation | (CDOT) |
| 8. Department of Corrections | (DOC) |
| 9. Department of Regulatory Agencies | (DORA) |
| 10. Department of Revenue | (DOR) |
| 11. Department of Public Safety | (DPS) |
| 12. Department of Education | (DOE) |
| 13. Department of Health Care Policy and Financing | (|
| 14. Department of Local Affairs | (DOLA) |
| 15. Department of Military Affairs | (DOMA) |
| 16. Department of Natural Resources | (DONR) |

Voluntary Members:

- 1.

Appendix II - Agency Greening Government Plan Template

Introduction

The Greening Government plan template is designed to provide agencies with a simple framework to help guide them to operate in a more sustainable fashion. These plans will need to be submitted to the Greening Government Coordinating Committee when completed. The State Sustainability Division staff as well as staff from the Office of Energy Management and Conservation and Department of Personnel and Administration will be available during the plan writing process to assist agencies with their efforts. For assistance with writing your plan contact:

Patrick Hamel	CDPHE	Patrick_hamel@state.co.us	303-692-2979
Richard Lee	DPA	richard.lee@state.co.us	303-866-4357
Susan Castellon	OEMC	susan.castellon@state.co.us	303-866-2259

Once the Agency Greening Government Plan is developed, agencies will only be responsible for reviewing and updating the information in the Plan each year, and will not have to develop a new plan unless major changes are in order.

Instructions

The template is broken into 5 sections with sub-headings that contain specific questions on information expected to be included in the Plan. Agencies should:

1. Review the *State Greening Government Planning and Implementation Guide* before writing the Plan. (The Administrative Team has developed this guide that includes background and educational information on Greening Government)
2. Respond to the questions included in brackets [] in each section of the template. These questions are included to help guide agencies in writing the Plan, but should not be considered all-inclusive. Agencies may add additional information they feel is appropriate.
3. Delete all italicized language upon completing each section of the Plan (your Agency Plan should not include the guidelines, these are included to help with writing the Plan).
4. Have your Agency Greening Government Council Representative review and sign the Plan prior to submitting it to the Administrative Team.
5. Agencies may want to submit a draft copy of their Plan to the Administrative Team prior to final submittal in order to receive feedback and comments.
6. Agencies must submit a final copy of their Plan to the Administrative Team:

*Colorado Department of Public Health and Environment
Attn: Sustainability Division
4300 Cherry Creek Drive South
Denver, CO 80246*

[Agency Name] Greening Government Plan

Date: _____
Agency Coordinator: _____
Phone: _____
Email: _____

This Greening Government Plan has been reviewed and approved by (_____)
of (_____) on (_____). (name)
(agency name) (date)

Signature of Agency Head or other Designee

1. Agency Information, Impact Identification and Greening Government Team

Refer to “Road Map Step 1” of the Planning and Implementation Guide before writing this section of the Plan.

This section is intended to provide basic information about the agency, its roles and responsibilities, existing impacts associated with operations, and any costs associated with such activities. Agencies should also identify their Greening Government Team in this section. More specifically, agencies should include information on the following:

1.1 Agency Description and Scope

[Include information on agency mission, size, number of staff, number of facilities, location of facilities, number of buildings, etc...]

1.2 Agency Impacts on the Environment and Human Health

[Identify the major operational activities of your agency that effect the environment and human health. E.g. employees commuting to work, printing reports, using electricity, watering lawns, etc...]

[Where feasible, identify the specific impacts on these operational activities, e.g. CDPHE uses X gallons of water per year, X kilowatt-hours of electricity per year. Use the 5 sections of the implementation guide as a framework (i.e. energy, water, waste reduction and recycling, environmental preferable purchasing, and transportation), and identify any additional impacts.]

1.3 Agency Operational Costs

[Identify the financial costs of your agency's activities identified above, e.g. DPA spends \$X per year on electricity, \$X on fuel, \$X on waste disposal.]

1.4 Agency Greening Government Team Members

[List members of your team, the roles they play, meeting schedule, or other relevant information.]

2. Long-Term Goals/Vision

Refer to "Road Map Step 2: Broadly Define Long-term Goals" before writing this section of the Plan.

2.1 Long-Term Goals

[Please identify your agency's long-term goals for greening government operations. These can be as broad as necessary and are not intended to be a list of specific actions the agency will be taking.]

[Agencies may wish to use this section to include a vision statement, environmental policy statement, letter of commitment from the Director, or other broad goal that relates to the agency's long-term goals.]

3. Short-term Actions and Priorities

Refer to "Road Map Step 3: Identify and Prioritize Short-term Actions" before writing this section of the Plan. Agencies should use this section to identify the priority areas they plan to focus on over the next 1 to 3 years.

3.1 Priority and Area Goals

[List 3 to 5 priority areas (e.g. recycling, water use, energy use) your agency will focus on, based on the biggest environmental impacts of your agency operation, opportunities for improvement, etc. over the next 1 to 3 years, and identify key short-term goals associated with these areas (e.g. Establish paper recycling in all offices; Eliminate purchases of mercury-containing products.)]

3.2 Agency Action Steps

[Agencies should identify specific strategies and actions required to meet short-term goals and address focus areas identified in 3.1.]

[The Greening Government Workplan (sample chart available in the Appendix III) is designed to help agencies identify appropriate strategies, specific tasks, and individual responsibilities and timeframes and should be submitted as part of the

Agency Greening Government Plan. Agencies may wish to replace the “responsible staff” column with Division or Title of responsible person, if appropriate.]

For ideas on a variety of strategies and action steps consult section 2 of the Planning and Implementation Guide.

4. Management Systems

Refer to “Road Map Step 4: Management Systems and Integrate Greening Government Into Decision-Making” before writing this section of the Plan.

4.1 Integrating Environmental Impacts into Key Decision Points

[Identify key decision points within your agency and identify the process that will ensure environmental impacts are taken into account at the correct point in the decision-making process. The “Road Map Step 4” has a chart that can be included in this section.]

4.2 Education and Training of Staff

[Identify ways your agency will educate appropriate staff on sustainability efforts and encourage new ideas within the agency.]

5. Tracking Progress and Program/Plan Review

Refer to “Road Map Step 5: Track and Report on Progress” before writing this section of the Plan.

5.1 Agency Tracking and Reporting Form

[Identify the process by which an agency will complete and submit the annual Agency Tracking and Reporting Form to be issued each year to the State Sustainability Administrative Team.]

5.2 Continuous Improvement

[Include a description of the following:

- The process by which greening government efforts will be evaluated and monitored to ensure they are working and achieving initial goals
- The process by which feedback will be encouraged and incorporated into future planning
- How this greening government plan will be reviewed and altered (if necessary) and who will be responsible for overseeing this process.]

Appendix III – Agency Greening Government Workplan Worksheet

For use in appendix II or the Agency Plan Template “Short Term Actions and Priorities” and should be submitted as part of the agency plan.

This worksheet is intended to help agencies develop an action plan to help identify the key greening government activities the agency wants to address, as well as identify the key staff necessary to ensure program success. The information provided here is for sample purposes only.

Greening Government Goal	Benefits of Project	Specific Tasks	Responsible Staff	Timeline
Increase paper recycling by 10% per year for 5 years.	<ul style="list-style-type: none"> • Solid Waste Reduction • Cost Savings 	<ul style="list-style-type: none"> • ID vendors through state contract • Award vendor • Publicize Program • Provide bins • Begin recycling 	<ul style="list-style-type: none"> • Jane Doe, Purchasing • John Doe, Facilities • Greening Government Team 	<ul style="list-style-type: none"> • March '06 review vendors • April '06 award vendor • May '06 educate employees • Etc...

Appendix IV: Indicators

Indicators (or measurements that can be compared from year to year) will be used to measure statewide progress for the environmental areas identified in the Executive Order. An initial list of indicators are listed below for informational purposes only:

State Greening Government Initial List of Indicators

1. **Energy Efficiency**
 - kWh of electricity reduced
 - Natural Gas, amount of therms reduced
 - Dollars saved on utility bills
 - % of state energy consumed from renewable energy
2. **Water Conservation and Quality**
 - Total gallons of water consumption reduced
 - Dollars saved on water reduction and sewage disposal
 - Pounds of pesticides, fertilizers eliminated from landscaping
3. **Waste Reduction and Recycling**
 - Number of new materials accepted at agency for recycling
 - Pounds of materials recycled
 - Agency recycling rate
 - Agency waste prevention results (specific projects, i.e. paper reduction)
4. **Environmentally Preferable Purchasing**
 - Number of agencies incorporating environmental criteria in service contracts
 - Dollars spent on EPP items (increase or decrease in cost compared to alternative)
 - Number of new products purchased that meet Green Seal Certification
 - Environmental benefits of EPP purchases by category. (i.e. X amount of paper purchased has 30% recycled content, this saved x amount of trees)
5. **Transportation**
 - Vehicle miles traveled per agency
 - Average fuel economy of agency fleet
 - Number of gallons of fuel used
 - Number of gallons of alternative fuels used in State Fleet.
6. **Activities**
 - Educational trainings
 - Workshops attended or hosted

Other indicators may be developed over time, based on available information and changes to reporting and tracking protocols.

Appendix V: Tracking Forms

Energy Efficiency Inventory/Tracking Sheet

Using the table provided below, please describe projects or examples that demonstrate ways your agency has reduced energy or used renewable energy sources.

Facility Info e.g. location, name and contact	Project Description e.g. date implemented, project details	Cost Description e.g. total cost, annual savings	Results e.g. kWh reduced, btu's reduced, etc

Please describe any future energy efficiency or renewable energy programs your agency is planning on implementing at your facilities.

Facility Info	Future Project Description	Projected Cost	Projected Results

Recycling and Waste Reduction Inventory/Tracking Sheet

Using the table provided below, please describe any examples of reuse, recycling or waste prevention projects or programs at your agency's facilities.

Facility Info e.g. location, name and contact	Project Description e.g. date implemented, project details	Cost e.g. total cost, annual savings	Results e.g. reduction in solid waste generation, amount recycled, recycling rate, etc.

Please describe any future waste reduction, reuse or recycling programs your agency is planning on implementing in the future (where appropriate, please include specific facility plans).

Facility Info	Future Project Description	Projected Cost	Projected Results

Water Use and Conservation Inventory/Tracking Sheet

The intent of this section is to determine what water conservation efforts are occurring and to track water conservation and reduction strategies at state agencies.

Using the table provided below, please describe any examples of water conservation projects or programs at your agency's facilities.

Facility Info e.g. location, name, and contact	Project Description e.g. date implemented, project details	Cost e.g. total cost, annual savings	Results e.g. gallons of water conserved

Please describe any future water conservation programs your agency is planning on implementing.

Facility Info	Future Project Description	Projected Cost	Projected Results

Environmentally Preferable Purchasing Inventory/Tracking Sheet

The intent of this section is to measure and track the purchases of environmentally preferable products (e.g. those that contain recycled content, are energy efficient, less toxic, etc.) and services by state agencies, and to identify the environmental and health impacts associated with such purchases as well as cost impacts.

Using the table provided below, please describe any examples of environmentally preferable purchasing (EPP) at your agency. (Do we want to say purchases that go beyond purchases made through statewide contracts? Should these be tracked by DPA? Ask Kay what she thinks) Please include examples of:

- EPP criteria and/or purchases made through your agency's service contracts (e.g. EPP cleaners purchased by janitorial company)
- Agency EPP purchases not made from a statewide contract (If DPA will be tracking statewide contract purchases)
- New EPP products purchased or tested by your agency

Facility Info e.g. location, name, and contact	Project Description e.g. date implemented, project details	Cost e.g. total cost, annual savings	Results e.g. recycled content in purchases, toxics reduced in cleaning chemicals, kWh reduction from energy efficiency.

Please describe any future environmentally preferable purchasing efforts your agency is planning on implementing.

Facility Info	Future Project Description	Projected Cost	Projected Results

Fleet Operations Inventory/Tracking Sheet

The intent of this section is to identify the impacts of state agency vehicle usage by measuring gallons of gasoline and other fuels used, number of alternative fuel vehicles and hybrids purchased and vehicle miles traveled in state owned vehicles.

Using the table provided below, please describe any examples of vehicle or fuel use projects or programs at your agency that are designed to reduce fuel consumption, greenhouse gas emissions or other pollutants.

Facility Info e.g. location, name and contact	Project Description e.g. date implemented, project details	Cost e.g. total cost, annual savings	Results e.g. ghg emission reductions, gallons of gasoline conserved, etc.

Please describe any future vehicle fuel reduction programs your agency is planning on implementing.

Facility Info	Future Project Description	Projected Cost	Projected Results

Please check the appropriate box if your agency offers any of the following incentives or assistance to employees choosing public transportation, car-pooling or bike riding as their method of commuting to work.

- Eco-passes
- Showers/lockers for bike commuters
- Secure bike storage
- Car-pooling incentives
- Preferred parking for hybrid vehicles
- Other:

Greening Government Roles and Responsibilities

In order for the State of Colorado's Greening Government Program to function properly it is important to define the roles and responsibilities of all groups that are involved in the program. The following is a list of responsibilities for the Greening Government Council, Steering Committee and all Subcommittees.

- **Greening Government Coordinating Council (Council)**
 - Shall meet periodically to provide feedback and ideas to the Administrative Team and Steering Committee on how projects are coming along and how the Greening Government process is working.
 - The Council member will be the lead for their agency's Greening Government Team or appoint somebody from their agency to be the lead contact.
 - Shall submit project results from their agency's work to the Administrative Team.
 - Review the yearly report that will be sent to the Governor's Office.

- **Greening Government Steering Committee (Committee)**
 - Develop structure and maintain the State's Greening Government Program.
 - Establish Greening Government goals.
 - Give recommendations to the Council on priorities for Greening Government projects.
 - Assist in the development and review of guidance documents and tracking forms.
 - Draft annual progress report for Governor's Office.
 - Collect, maintain, evaluate and disseminate best practices and procedures throughout the state.

- **Greening Government Subcommittees**
 - Develop background and educational materials for the five chosen areas.
 - Collect data from agencies on projects they have already completed (inventory).
 - Assist agencies with the implementation of projects related to their field of expertise.

APPENDIX D D005 05 EXECUTIVE ORDER GREENING OF STATE GOVERNMENT

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, I, Bill Owens, Governor of the State of Colorado, hereby issue this Executive Order concerning enhancing the efficiency and greening of state government.

1. Background and Need

State government needs to operate as efficiently as possible, but at the same time it is important to set an example through efforts to reduce the use of limited resources, increase the cost effectiveness of state government, and improve Colorado's environment and the health of our children and future generations. Accordingly, the State of Colorado is committed to business practices that contribute to the mutually compatible goals of economic vitality, a healthy environment and strong communities.

The State has already taken significant steps in this direction, particularly under Executive Order D 014 03, Energy Performance Contracting to Improve State Facilities. The Department of Corrections through its Energy Management Program avoids \$1.8 million in annual costs (10 percent of its utility budget) and is planning additional facility improvements that could result in avoided annual costs exceeding \$1 million. The Department of Human Services through its aggressive program to manage its \$5.3 million annual utility budget achieved a 10 percent level of cost avoidance and is implementing projects through performance contracts that will avoid an additional \$1,000,000 in annual utility costs. The Department of Personnel and Administration, with the Judicial Department and the Department of Labor & Employment, is using performance contracting for a large-scale, comprehensive effort that captures \$800,000 in annual reductions to pay for \$14 million in facility upgrades. Other state agencies including the Department of Military Affairs, Colorado School for the Deaf and the Blind, Department of Public Health and Environment, and Department of Natural Resources are implementing similar projects. Within state government, such sustainable practices require decisions based on a systematic evaluation of the costs and long-term impacts of an activity or product on health and safety, communities, and the environment and economy of the State of Colorado. State agencies, through changes in daily operations, ongoing programs, and long-range planning, are able to simultaneously have a significant positive impact on the environment, economic efficiency of state government, and the character of our communities. Government can also foster markets for emerging environmental technologies and products. Finally, state government can be a model for environmental leadership by implementing pollution prevention and resource conservation programs that not only enhance environmental protection, but also save taxpayers'

money through reduced costs, including reduced material costs, waste disposal costs and utility bills. The most effective manner for state government to implement such programs is through the establishment of systems and procedures to evaluate costs and manage environmental impacts. This system should be developed and implemented consistently across state government with the assistance of the Governor's Office of Energy Management and Conservation, Department of Public Health and Environment and Department of Personnel and Administration.

2. Directive

A. I hereby direct the Executive Directors of all state agencies and departments to evaluate their current business operations in accordance with the goals of this Order and develop and implement policies and procedures to promote environmentally sustainable and economically efficient practices, including, but not limited to:

- i. Adopting the United States Green Buildings Council's Leadership in Energy and Environmental Design Green Building Rating System[□] for Existing Buildings (LEED-EB) in operating, maintaining and managing existing buildings, to the extent applicable and practicable.
- ii. Incorporating LEED for New Construction (LEED-NC) practices to design energy and resource efficient new buildings, to the extent that this is deemed cost effective.
- iii. Initiating an energy management program to monitor and manage utility usage and costs, as resources become available.

B. I hereby direct the Executive Directors of the Governor's Office of Energy Management and Conservation, Department of Public Health and Environment, and Department of Personnel and Administration, to establish a Colorado Greening Government Coordinating Council (Council) to include representatives from each state agency and department.

C. I hereby direct the Council to develop, implement, and augment programs, plans and policies that save money, prevent pollution and conserve natural resources throughout state government management and operations, including but not limited to source and waste reduction, energy efficiency, water conservation, recycling, fleet operations, environmental preferable purchasing, and establishing state-wide goals to save taxpayers' money and reduce environmental impacts.

D. I hereby direct State agencies and departments to provide all reasonable assistance and cooperation requested by the Council for the purpose of carrying out this order.

E. I hereby direct each State agency or department to annually submit to the Council a list of all projects implemented in accordance with this Executive Order in the previous calendar year and the resultant environmental benefits and cost savings. To assist agencies in this effort, the Governor's Office of Energy Management and Conservation offers technical services to all State departments and agencies.

3. Duration

This Executive Order shall remain in force until further modification or rescission by the Governor.

GIVEN under my hand and the
Executive Seal of the State
of Colorado, this 15th
day of July, 2005.

Bill Owens
Governor

APPENDIX E COLORADO DEPARTMENT OF TRANSPORTATION HEADQUARTERS GREENING GOVERNMENT PRE- IMPLEMENTATION PLAN

Date: June 19, 2007
Agency Coordinator: Patricia Martinek
Phone: (303) 757-9787
Email: Patricia.Martinek@dot.state.co.us

- **Agency Information, Impact Identification and Greening Government Team**
 - **Agency Description and Scope**

The Colorado Department of Transportation (CDOT) employs approximately 3300 personnel and is responsible for a 9,156 mile highway system, including 3,714 bridges. Each year, this system handles over 26.1 billion vehicle miles of travel. CDOT maintenance forces take care of the highway system, plowing snow and repairing pavement. Last winter, CDOT employees plowed 5.548 million miles of highway. They also repaired road damage and potholes, using more than 330,371 tons of asphalt and 1.97 million gallons of liquid asphalt in preservation activities. (3)

CDOT's Vision: To enhance the quality of life and the environment of the citizens of Colorado by creating an integrated transportation system that focuses on moving people and goods by offering convenient linkages among modal choices.

CDOT's Mission: To provide the best multi-modal transportation system for Colorado that most effectively moves people, goods, and information.

CDOT's Values:

PEOPLE We value our employees! We acknowledge and recognize the skills and abilities of our coworkers, place a high priority on employee safety, and draw strength from our diversity and commitment to equal opportunity.

RESPECT We respect each other! We are kind and civil with everyone, and we act with courage and humility.

INTEGRITY We earn Colorado's trust! We are honest and responsible in all that we do and hold ourselves to the highest moral and ethical standards.

CUSTOMER SERVICE We satisfy our customers! With a can-do attitude we work together and with others to respond effectively to our customer's needs.

EXCELLENCE We are committed to quality! We are leaders and problem solvers, continuously improving our products and services in support of our commitment to provide the best transportation systems for Colorado.

CDOT Research developed the Headquarters Greening Government Pre-Implementation Plan (Plan) as part of a research project to identify CDOT's activities that provide opportunities to green CDOT. To green CDOT means to implement green actions that will reduce the environmental impact of CDOT's activities. Greening of CDOT will support the two Greening of State Government Executive Orders signed by Governor Ritter on April 16, 2007 and the 2006 State of Colorado Greening Government Planning and Implementation Guide (Guide) prepared by the Colorado Greening Government Coordinating Council. The Guide was developed as guidance for state agencies to implement previous greening the government initiatives, and the Guide focuses on the following environmental topics: (13)

- Energy Efficiency
- Water Conservation and Quality
- Waste Reduction and Recycling
- Environmental Preferable Purchasing
- Transportation

This Plan focuses on Headquarters with a main concentration on the five environmental topics from the Guide as well as a small focus on the environmental impacts of buildings. CDOT Headquarters was chosen due its size, variety of uses, employee supportiveness, and its influence on other regional offices to lead by example in the greening government initiative. CDOT Headquarters visits were performed to gain a better understanding of CDOT activities and processes as they relate to the requirements in the greening government executive orders. Since the scope of the executive orders is broad and the requirements affect divisions across CDOT's operations, the Headquarters visits were divided into multiple informal meetings with the following divisions:

- Fleet Vehicles
- Procurement/Purchasing
- Facilities Management
- Print Shop
- Information Technology
- Planning

The purpose of the meetings was to begin to identify how the different divisions within CDOT function and the activities they perform. By understanding the individual processes and activities within each division, CDOT Research was able to identify green actions that can potentially be implemented in order to comply with the requirements of the executive orders. Additionally, the meetings helped identify that the following additional areas should be visited and further researched in Phase 2 of the Greening Government Research Project:

- CDOT Greening Government Steering Committee
- CDOT EMS Steering Committee
- Colorado Greening Government Coordinating Council
- Executive Management
- Human Resources
- Accounting
- Environmental Branch of DTD and Regions
- Business Offices
- Approved Products List staff
- A small sample of the following roles from CDOT Regions 1 through 6

- Shop Supervisors
- Regional IT Analysts
- Business Managers
- Office Operations
- Division heads responsible for SAP training in the following modules:
 - Plant Maintenance
 - Materials Management
 - Real estate
 - Sales and Distribution
 - Learning Solutions
 - Business Data Warehouse

The Plan focuses on the environmental impacts of CDOT Headquarters in the areas of energy efficiency, water conservation and quality, waste reduction and recycling, environmental preferable purchasing, and transportation. The plan also touches on the operation and maintenance of buildings. The overall goal of the Plan is to identify green actions that can help CDOT Headquarters contribute to achieving the goals of the greening government executive orders.

▪ **Areas of Agency Environmental Impacts & Greening Government Requirements**

The activities of CDOT Headquarters are varied and have impacts in the following areas, which include the five focus areas from the Guide:

- Energy Efficiency
- Water Conservation and Quality
- Waste Reduction and Recycling
- Environmental Preferable Purchasing
- Transportation
- Buildings

Energy and Transportation

Energy consumption is an area of great importance. The reduced supply, increased cost, impact to the quality of air, and high consumption rate make energy consumption an area of great concern. Energy consumption includes gas and electricity utilized to heat, cool, and light buildings, energy utilized for office activities, and fuel utilized in state vehicles, equipment, and employee transportation. According to 2004-2005 figures for state departments, the state utilized \$38 million in energy that year. (13) CDOT had utility expenditures of nearly \$7.5 million (12), but it could not be determined how much of that utility expenditure was related to energy.

Reducing energy consumption would provide both economic and environmental benefits to overall state operations. According to the Guide, a cost savings of 25% can be achieved by implementing cost-effective replacements and operational strategies. That 25% reduction in energy consumption translates into a reduction of fuel consumed and a reduction of air pollution emitted. (13) There are many opportunities for CDOT to improve energy efficiency by incorporating energy efficiency practices and systems into buildings, equipment, and employee behavior.

Water Conservation and Quality

Activities by state agencies also utilize significant amounts of water. CDOT employs approximately 3300 personnel who utilize water for indoor consumption through restrooms and sinks as well as outdoor consumption for landscaping, vehicle washing, and other activities. CDOT has an opportunity to reduce the quantity of water consumed through installation of water efficient equipment and fixtures and through changes in employee behaviors and activities. CDOT can also reduce impact to the quality of water in Colorado by improving its environmental management system that relates to stormwater management from construction and road maintenance activities.

Waste Reduction and Recycling and Environmental Preferable Purchasing

State government operations generate thousands of tons of waste every year. By reducing the amount of waste generated, CDOT can save money on disposal costs and fees, reduce the amount of waste sent to landfills, encourage recycling and re-use of materials, reduce demand of virgin material, and reduce air emissions, fuel consumption, and traffic congestion from transporting activities. CDOT can also encourage environmentally preferable purchasing practices to promote the use of recycled products and materials to realize similar environmental benefits. Waste reduction, recycling and re-use of materials, environmentally preferable purchasing habits, and changing employee behavior can all contribute to reducing CDOT's environmental footprint.

Buildings

Buildings in the United States have a huge impact on the natural environment, including all the areas of concern discussed above. From the planning stage through construction, operation and maintenance of the buildings, there are many opportunities to reduce the environmental impacts associated with buildings as well as to reduce the associated costs of maintaining and operating those buildings. According to the U.S. Green Building Council (USGBC) website, Buildings in the United States account for: (15)

- 70% of electricity consumption
- 30% of greenhouse gas emissions
- 65% of waste output
- 12% of potable water consumption

While this specific data on environmental impacts from buildings represents both public and private buildings in the United States, much opportunity exists in state government to reduce the environmental impacts associated with the construction, operation and maintenance of state buildings. In Colorado, the state government is responsible for overseeing over 60 million square feet of property and more than 5,000 buildings. (13) If these buildings are built, operated, and managed in a more sustainable manner, state government can contribute to a reduction in the overall environmental impact resulting from buildings in the United States.

Leadership in Energy and Environmental Design (LEED) is a sustainability rating system for buildings that was developed by the U.S. Green Building Council (USGBC), a non-profit organization whose purpose is to transform the building marketplace to sustainability by providing the building industry with consistent, credible standards for what constitutes a

green building. LEED addresses all building types including existing buildings, new construction, commercial interiors, core & shell, homes, neighborhoods, and specific applications such as retail, multiple buildings/campuses, schools, healthcare, laboratories and lodging. (15)

The specific standards of LEED that are referenced in the greening government executive orders are LEED for existing buildings (LEED-EB) and LEED for new construction (LEED-NC). LEED-EB provides guidelines for operating, maintaining, and managing existing buildings using environmentally sustainable and economically efficient practices. (16) LEED-NC provides guidelines for designing energy and resource efficient new buildings through green building practices. (17) According to the USGBC website, LEED certified buildings reduce energy and water consumption over conventional buildings, encourage the use of local building materials, perform at a lower annual operating cost, create jobs in the local community, provide a healthier indoor environment, and increase occupant productivity. (15)

The LEED rating system certifies and scores the design, construction and operation of green buildings at the following four different certification levels, depending on the total credits incorporated into the buildings: LEED Certified, LEED Silver, LEED Gold, and LEED Platinum. The rating system tallies scores for different aspects of efficiency and design in the following categories or credit areas: (17)

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation and Design Process

The actual LEED certification process requires paperwork, additional time for preparation and planning, and a certification cost for a third-party to verify that the building project meets high performance standards. However, an agency can adopt LEED and decide to incorporate the elements of the LEED rating system into the design, maintenance and operation of buildings without undergoing the certification process. In doing so, the building will be built green, the environmental impact of the building will be reduced and savings will be realized. According to the USGBC website, the average savings of green buildings include: (15)

- 30% savings in energy
- 35% carbon savings
- 30 – 50% water use savings
- 50 – 90% waste cost savings

In addition to these quantified savings, green buildings that were built by incorporating elements of the LEED rating system also come with other benefits including increased value, enhanced productivity for occupants, lower operating cost, reduced overall environmental footprint, and demonstration of a commitment to environmental stewardship and social responsibility. (15)

The following table summarizes greening government requirements for state government within Colorado as they relate to LEED as well as energy efficiency, water conservation and quality, waste reduction and recycling, environmental preferable purchasing, transportation, and buildings.

Table 1: Greening government requirements in Colorado

<i>Initiative or Requirement</i>	<i>Summary of Green Requirements</i>
Act 24-103-207	All state agencies are required that 50% of their paper purchases have at least a 30% recycled paper content. (4)
EO D 014 03 Governor Owens (7/16/03)	Requires all State agencies to initiate energy performance contracts where opportunity exists to better utilize budgets; feasibility study should be submitted to the Department of Personnel and Administration by July 04. (8)
EO D 005 05 Governor Owens (5/15/05)	To the extent applicable and practicable, requires state agencies to adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction. (9)
Senate Bill 06-016 (2006)	Alternative Fuel Use Requirement: By January 1, 2007, the Department of Personnel must adopt a policy that requires all state-owned diesel vehicles and equipment to be fueled with a fuel blend of 20% biodiesel and 80% petroleum diesel (B20), subject to the availability of the fuel and so long as the price is no greater than \$0.10 more per gallon than the price of conventional diesel; By July 10, 2010, adopt a policy requiring that at least 10% of all state-owned bi-fuel vehicles be fueled exclusively with an alternative fuel. (6)
Senate Joint Resolution SJR 06-032 (2006)	The General Assembly supports the use of LEED as a design and construction guideline for public and private facilities and urges the state of Colorado and its agencies and departments to design and construct facilities to achieve LEED silver certification. (5)
Senate Bill 07-051 (4/16/07)	High Performance State Buildings: Requires any new or renovated building whose total project cost includes 25 percent or more in state funds to be designed and built to a high performance green building standard; requires third party certification to a green standard such as LEED and that increased initial costs are regained through decreased operational costs within 15 years. (7)

<i>Initiative or Requirement</i>	<i>Summary of Green Requirements</i>
EO D0011 07 (4/16/07) Governor Ritter	Greening of Government: Goals and Implementation. By 2012, State agencies are required to reduce energy consumption by 20 percent at all state facilities, cut paper use by 20 percent, cut water use by 10 percent and cut petroleum use by 25 percent in state vehicles; by 12/1/07, state agencies are required to complete a transportation efficiency audit addressing methods for improving the environmental efficiency of the state fleet; elements of D 005 05 remain in place and are to be read in conjunction with this Executive Order. (10)
EO D0012 07 (4/16/07) Governor Ritter	Greening of Government: Detailed Implementation; reiterates performance contracting from EO 014 03; where performance contracting is not feasible, state agencies must reduce energy consumption by 10% from 2005-06 fiscal baseline; requires agencies to develop and implement materials management, purchasing, and resource management policies; requires working with the Greening Council to adopt a goal of “zero waste”; requires following a DPA / DPHE purchasing policy that will include the purchase of products to consider recycled content, toxicity, and impact on air and water resources; energy star; requires that electronic equipment purchases consider life-cycle and energy impacts; requires the Greening Council to develop standards for the leasing of state buildings that will address water, energy, recycling, and access to public transportation; requires restrictions in purchase of 4WD, replacement of pre-1996 light duty trucks that get <25 miles to the gallon, and annual reporting to Greening Council on petroleum reduction; requires use (when available) of a minimum of 20% bio-diesel blend for diesel vehicles, fueling flex vehicles with alternative fuels 50% of the time.; elements of D 005 05 remain in place and are to be read in conjunction with this Executive Order. (11)
Energy Policy Act: State & Alternative Fuel Provider Rule - EAct 507 (1996)	For state agencies that have more than 50 light-duty vehicles (LDV) (excluding emergency vehicles, law enforcement, vehicles parked at personal residences) and 20 of them are primarily used in metropolitan areas and those 20 vehicles are centrally fueled or capable of being centrally fueled, those agencies are required to comply with the Alternative Fueled Vehicle Acquisition Mandate; states are required to purchase an increasing amount of Alternatively Fueled Vehicles (AFV) starting in 1996. The following is the required schedule of AFV purchases as a percentage of total new LDV purchases by State fleets: 10 percent for model year (MY) 1996, 15

<i>Initiative or Requirement</i>	<i>Summary of Green Requirements</i>
	percent for MY 1997, 25 percent for MY 1998, 50 percent for MY 1999, and 75 percent for MY 2000 and beyond. (14)

▪ **Agency Operational Costs**

The main operational costs of CDOT Headquarters include research, payroll, program implementation, vehicle purchasing, energy consumption, water consumption, fuel costs, waste disposal costs, road and equipment maintenance costs, materials purchasing, product and parts purchasing, and various contractor service costs.

According to the information submitted for fiscal year 2004-2005 for inclusion in the State of Colorado Greening Government Status Report (Report), CDOT had utility expenditures of nearly \$7.5 million. These utility expenditures covered over 2.5 million square feet of CDOT owned properties. (12) The Report did not specify what utilities were included in the reported costs, or how much of each utility was consumed. No other operational costs were included in the Report.

From speaking with the CDOT divisions, it appeared that the tracking of utility consumption is somewhat inconsistent across CDOT. Facilities Management for Headquarters tracks the consumption of energy and water at the CDOT Headquarters complex in Denver. Property Management and maintenance track utility consumption for other CDOT buildings. Tracking of utility consumption for some CDOT owned and tenant occupied buildings is not taking place.

Waste is not being tracked consistently across the CDOT operations, but quantities and collection frequencies could be obtained from waste vendors. Paper consumption is not being tracked consistently across CDOT operations. However, paper consumption for CDOT Headquarters can easily be obtained by contacting the vendor(s).

▪ **Agency Greening the Government Team Members and Efforts to Date**

Per Executive Order D 005 05, A Colorado Greening Government Coordinating Council (Greening Council) has been formed to promote environmentally sustainable and economically efficient practices in accordance with the goals of the executive order. As stated in the Executive Order, the Greening Council has been given the responsibility to, “develop, implement, and augment programs, plans and policies that save money, prevent pollution, and conserve natural resources throughout state government management and operations, including but not limited to source and waste reduction, energy efficiency, water conservation, recycling, fleet operations, environmental preferable purchasing, and

establishing state-wide goals to save taxpayers' money and reduce environmental impacts.”
(9)

The Greening Council consists of Angie Fyfe from the Governor's Energy Office serving as the Greening Government Manager and an administrative team. The administrative team consists of the following individuals and their respective state agencies: Patrick Hamel from the Colorado Department of Public Health and Environment (CDPHE), Susan Castellon from the Governor's Energy Office, and Richard Lee from the Colorado Department of Personnel and Administration.

The most recent Greening Council meeting took place in July of 2007. Prior to the meeting, the Executive Directors of State Agencies were sent an invitation to the meeting and asked to appoint a representative from within their agency to participate in the Greening Council meeting. Past meetings have involved CDOT participation from Brad Beckham, Environmental Programs Branch Manager, and Patricia Martinek, Environmental and Planning Research Manager in CDOT's Division of Transportation Development (DTD). In July, 2007, Del Walker, Director of Staff Branches, represented CDOT at the Council meeting.

In order to better represent CDOT at the Greening Council meetings and better assist with the implementation of the greening government executive orders, Ms. Martinek organized a Greening Government Steering Committee within CDOT that consists initially of the following CDOT employees:

- Patricia Martinek, Environmental and Planning Research Manager
- Brad Beckham, Environmental Programs Manager
- Del Walker, Director of Staff Branches
- Cheryl Wright, Procurement Services Manager
- Johnny Olson, Maintenance and Operations Superintendent
- Joe Mahoney, Facilities Management

The CDOT Greening Government Steering Committee does not currently contain representation from all CDOT divisions. Adding additional divisions can help contribute to the successful implementation of the green actions recommended in the Plan. The following divisions can reinforce the goals and ability of the CDOT Greening Government Steering Committee to implement green actions needed to meet the requirements of the executive orders:

- Executive Management
- Human Resources
- Public Relations
- Information Technology (IT)
- Planning and Environmental

CDOT Headquarters has already done an excellent job implementing some green measures where possible that can help to meet some of the greening government requirements. The following table outlines some of the green actions already implemented by CDOT Headquarters, their resulting environmental benefits, and the greening government requirements these actions help satisfy.

Table 2: Green actions implemented by CDOT Divisions within Headquarters

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
1	Facilities Management	Facilities Management is currently working on an RFP for Energy Performance Contracting to take place; they will look at older systems such as the electrical equipment in the Eisenhower Tunnel to replace with more efficient systems.	The energy performance contracting will identify areas for energy conservation. If changes are implemented, CDOT will save money without upfront cost to fund the projects.	EO D014 03 – initiate energy performance contracts; EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
2	Facilities Management	Installed a flat plate mechanical system	Reduces energy consumption, eliminated need to run the cooler	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
3	Facilities Management	Upgraded the irrigation system to run off of well water and wireless zones on timers	Replaced consumption of some city water with well water; made system more energy and water efficient	EO D0011 & EO D0012 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
4	Facilities Management	Upgraded the lights at Headquarters with energy star fixtures that utilize compact fluorescent bulbs	Reduces energy consumption; reduces waste generated by more frequent disposal of bulbs with a shorter life cycle	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
5	Facilities Management	Replaced some of the toilets with newer low-flow toilets	Reduces water consumption	EO D0011 & EO D0012 – Reduce water consumption by 10% by 2012.
6	Facilities Management	Trained employees in Facilities Management to turn off sprinklers on days when rain is expected	Prevents water use when water is not needed; reduces consumption	EO D0011 & EO D0012 – Reduce water consumption by 10% by 2012.
7	Facilities Management	Cleaning staff utilizes only green products	Environmental Preferable Purchasing; protects health and safety of	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
			employees who come in contact with cleaning products	goal of zero waste from construction of new buildings and operation of existing facilities.
8	Facilities Management	Re-roofing with a new energy efficient membrane	Reduces energy consumption of building	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
9	Facilities Management	Utilizes recycled cubicle walls when furnishing buildings, and installs carpet squares instead of rolls to allow for easy replacement of high-wear areas	Reduces the demand on virgin materials; re-use prevents these items from entering landfills as trash.	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
10	Facilities Management	Arranged a deal with Hewlett Packard to remove old monitors when new monitors are purchased.	Eliminates need to dispose of universal waste; saves money and time	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
11	Facilities Management	Implemented an energy management system so computers can control room temperatures	Reduces energy consumption	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012.
12	Fleet Vehicles - Region 5, Alamosa	Alamosa is starting to run biodiesel in their equipment	Replaces petroleum consumption with a renewable fuel source	EO D0011 & EO D0012 – Environmental Preferable Products
13	Fleet Vehicles	Changed to synthetic gear oil for use in transmissions.	Reduces draining requirements from once every year to once every 3 years; reduces amount of oil purchased; reduces amount of waste generated; reduces cost from purchase and	EO D0011 & EO D0012 – Environmental Preferable Products

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
			disposal	
14	Fleet Vehicles	Maintenance schedules for vehicles and equipment are starting to be tracked in SAP. SAP sends a reminder when maintenance needs to be performed.	Regular maintenance of vehicles extends the life of the vehicle; reduces overall maintenance of vehicle	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
15	Fleet Vehicles - Alamosa	Alamosa is purchasing 90% recycled antifreeze.	Environmental Preferable Purchasing; encourages recycling over disposal; minimizes waste generation	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
16	Fleet Vehicles - various maintenance shops	Installed aqueous cleaners to replace solvent-based cleaners.	Eliminated hazardous solvent; reduced the amount of hazardous waste generated	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
17	Fleet Vehicles - various maintenance shops	Some shops are utilizing Jiffy recycled engine oil.	Environmental Preferable Purchasing; reduces reliance on virgin oil; encourages re-use of products	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
18	Fleet vehicles – Durango, Pueblo, Alamosa	Some shops are recapping tires for re-use.	Environmental Preferable Purchasing; reduces waste generated; encourages re-use of products	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
				existing facilities.
19	Fleet Vehicles - Alamosa	Shops in Alamosa are burning used oil in space heaters for heat.	Reduces energy required to heat building; prevents used oil from becoming a waste by re-using it as a fuel; reduces cost associated with used oil disposal	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
20	Fleet Vehicles – Alamosa and most main shops	Most shops drain, crush, and recycle their used oil filters.	Reduces waste going to the landfill; encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
21	Fleet Vehicles - various maintenance shops	Some shops utilize recycled water for power washing of vehicles or equipment.	Reduces water consumption; encourages re-use of water	EO D0011 & EO D0012 – Reduce water consumption by 10%; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
22	Information Technology	Provides a recommended product list to CDOT divisions for monitors and desktop printers. All recommended products are EnergyStar.	Reduces energy consumption; Environmentally Preferable Purchasing	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
23	Information Technology	Recommends monitors be set to sleep mode after 30 minutes of inactivity.	Reduces energy consumption	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012
24	Information Technology	Provides access to work email through VPN which allows employees to work from home.	Reduces commuter petroleum consumption and air pollution by CDOT employees	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
25	Information Technology	All black and white network printers are programmed to print double-sided.	Reduces paper consumption and waste generated.	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
26	Information Technology	All toner cartridges are recycled.	Reduces waste going to the landfill, encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
27	Information Technology	Purchases paper with recycled content for all Headquarter network printers.	Environmentally Preferable Purchasing	EO D0011 & EO D0012 - Environmental Preferable Products; Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content
28	Information Technology	Recycles cell phones within the Information Technology and accepts cell phones from other divisions for recycling.	Reduces waste going to the landfill, encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities
29	Information Technology	Recycles batteries through Battery Plus. Uses refurbished batteries.	Reduces waste going to the landfill, encourages reusing and supports environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
30	Information Technology	Installed software that can reroute calls which	Reduces commuter	EO D0011 & EO D0012 – Cut

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
		allows employees handling the Help Desk to work from home.	petroleum consumption and air pollution by CDOT employees	petroleum use in state vehicles by 25% by June 30, 2012.
31	Information Technology	Implementing videoconferencing in Fiscal Year 2008.	Reduces commuter petroleum consumption and air pollution by CDOT employees, improves employee efficiency and safety from reduced driving	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
32	Planning	CDOT is currently using two federal grants: Safe Routes to School (to make it easier for kids to walk or bike to school) and Congestion Mitigation/Air Quality (offering transportation alternatives in areas with congestion and air quality concerns).	Reduces petroleum use, reduces air pollution, encourages employee health and safety	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
33	Planning	Promote bicycle/pedestrian friendly designs in workshops. Encourage individuals in each Region to volunteer to help ensure bicycle racks and facilities are available.	Reduces petroleum use, reduces air pollution, encourages employee health and safety	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
34	Planning	Provide commuter checks to employees who bicycle, walk, and take public transportation to work and meetings.	Reduces petroleum use, reduces air pollution, encourages employee health and safety, rewards employee behavior	EO D0011 & EO D0012 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
35	Planning	Promotes “Bike to Work Month.” and have a shed for bicycle storage.	Reduces petroleum use, reduces air	EO D0011 & EO D0012 – Cut petroleum use in

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
			pollution, encourages employee health and safety	state vehicles by 25% by June 30, 2012.
36	Print Shop	The print shop currently recycles ink cartridges, toner, and paper.	Reduces waste generated; encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities
37	Print Shop	The Print Shop currently utilizes a vendor to launder rags.	Reduces waste generated; supports re-use; environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
38	Print Shop	The Print Shop utilizes water-soluble inks and solvents.	Eliminated hazardous waste generation; environmentally preferable purchasing	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
39	Print Shop	The Print Shop eliminated its old pre-press machine and currently recycles the metal plates used for the new press.	Reduces waste generated; encourages recycling	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
40	Print Shop	The Print Shop eliminated hazardous chemicals associated with the print process.	Eliminated hazardous waste generation; protects employee health and safety; supports environmentally	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities;

	CDOT Division	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
			preferable purchasing	Environmental Preferable Products
41	Purchasing / Procurement	Purchasing / Procurement has worked out a deal with 3 of the 6 office supply vendors to provide a 1% discount on the purchase of green products.	Environmentally preferable purchasing; encourages use of recycled products	EO D0011 & EO D0012 – Environmental Preferable Products
42	Purchasing / Procurement	Has worked with Property Management to include in bid specifications energy star light and heating fixtures and energy efficient insulation.	Environmentally preferable purchasing; reduces energy needed to cool, light, and heat the building throughout the building's life	EO D0011 & EO D0012 – Environmental Preferable Products; reduce energy consumption by 20% by 2012.
43	Purchasing / Procurement	CDOT participates in an office supply consortium consisting of multiple state agencies including CDPHE, Department of Labor and Employment, Department of Revenue, and the Department of Corrections.	Brings a louder voice and has a greater impact on environmentally preferable purchasing	EO D0011 & EO D0012 – Environmental Preferable Products
44	Purchasing / Procurement	Some staff members utilize double-sided printing.	Reduces paper consumption; reduces paper that will need to be recycled	EO D0011 & EO D0012 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities
45	Purchasing / Procurement	Staff currently turns out lights and recycles pens.	Reduces energy consumption; reduces waste generated	EO D0011 & EO D0012 – EO Adopt a goal of zero waste from construction of new buildings and operation of existing facilities; reduce energy consumption by 20% by 2012.

2.0 Long-Term Goals / Visions

2.1 Long-Term Goals

CDOT has adopted the following Environmental Ethics Statement:

“CDOT will support and enhance efforts to protect the environment and quality of life for all of Colorado’s citizens in the pursuit of providing the best transportation systems and service possible.”

19. CDOT goes beyond environmental compliance and strives for environmental excellence.
20. CDOT promotes a sense of environmental responsibility for all employees in the course of all CDOT activities.
21. CDOT ensures that measures are taken to avoid or minimize the environmental impacts of construction and maintenance of the transportation system and that mitigation commitments are implemented and maintained.
22. CDOT designs, constructs, maintains, and operates the statewide transportation system in a manner which helps preserve and sustain Colorado’s historic and scenic heritage and fits harmoniously into communities and the natural environment.

In addition to conforming to CDOT’s environmental visions above, long-term greening government goals for CDOT include promoting an overall sustainable system that contributes to meeting the goals of the greening government executive orders. The long-term goals for CDOT Headquarters include implementing green actions to achieve the specific goals of the greening government executive orders relating to energy consumption, water consumption, waste generation, paper use, fuel consumption, and environmentally preferable products purchasing, and buildings.

▪ Short-term Actions and Priorities

3.1 Priority and Area Goals

Short term priorities are areas which CDOT plans to focus on within the next 1 – 3 years. (13) Short-term priorities for CDOT Headquarters include reviewing the research and recommendations in Tables 4 and 5 of this Plan to determine what can be implemented in an effort to meet the goals of the greening government executive orders. These recommendations should be reviewed by the CDOT Greening Government Steering Committee and the applicable CDOT Divisions. In reviewing the recommendations, CDOT should determine the following, based on budget, resources, regulatory requirements, degree of control, and environmental and economic benefits received:

- Which green actions will be implemented
- Additional green actions that can be implemented
- Who in CDOT is responsible for implementing the green actions
- Timeframe for completion of the green actions

When determining which actions in the Plan should be implemented, CDOT’s Greening Government Steering Committee should also consider the questions in the following table for each suggested green action. (13) Answers that have a “yes” answer to many or all of the questions should be given highest priorities in both long and short-term goals:

Table 3: Use of questions to determine which green actions should be implemented by the Divisions within CDOT Headquarters

Question	Yes	No
Will the action result in environmental / health benefits?		
Are the environmental benefits significant?		
Will the action result in a cost savings over the life of the product / action?		
Are the cost savings significant?		
Will the action support progress in one or more of the Implementation Guide priority areas (energy efficiency, water conservation and quality, waste reduction and recycling, environmental preferable purchasing, transportation)?		
Is the time frame and ease of implementation manageable given agency resources?		
Would this activity help to maintain compliance and meet regulatory requirements?		
Could the action reduce compliance obligations (reporting, fees, management costs)		
Is the issue of significant concern to employees, or those who use your services?		
Does the activity have a clear educational value or provide high visibility?		

After short and long-term green actions have been identified for CDOT Headquarters to implement, the actions should be incorporated into a statewide CDOT Greening Government Implementation Plan. After a CDOT Greening Government Implementation Plan is developed for CDOT and approved by the CDOT Greening Government Steering Committee, it must be submitted to the Colorado Greening Government Coordinating Council (Greening Council). CDOT will be responsible for reviewing and updating the information in the Implementation Plan each year for re-submittal to the Greening Council and will not have to develop a new plan each year unless major changes to the previous year’s Plan have occurred. (13)

- **Agency Green Actions**

The following tables recommend initial green actions and tasks that can be implemented at CDOT Headquarters in an effort to reduce CDOT’s environmental footprint and meet the goals of the greening government executive orders.

Table 4 identifies 13 high priority recommended green actions that should be implemented as CDOT's next steps. These 13 next steps can be summarized as the following general actions:

1. Designate an energy management liaison
2. Meet as the CDOT Greening Government Steering Committee
3. Develop baseline information for FY 2005-2005
4. Compile consumption data for FY 2006-2007
5. Configure a performance indicator tracking system
6. Review research and determine which green actions will be implemented

Table 5 includes both short-term and long-term actions, depending on the schedule of implementation CDOT determines, which will be based on the questions in Table 3 and budget, resources, regulatory requirements, degree of control, and environmental and economic benefits received.

Table 4: High priority recommended green actions and tasks to be implemented.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
1	Implement Greening State Government Initiative	Give some teeth to implementing the requirements of the Executive Orders	Officially form the CDOT Greening Government Steering Committee. Include some additional divisions and director level executive management in the CDOT Greening Government Steering Committee. This will reinforce the ability of the CDOT Greening Government Steering Committee to implement the requirements of the executive orders. Consider including staff from Human Resources, Public Relations, Information Technology, Planning, and executive management positions, such as the Executive Director, Chief Engineer, and/or the Director of Transportation Development. Members of the CDOT Greening Committee should stay abreast of greening initiatives for their respective divisions.	Currently, the CDOT Greening Government Steering Committee includes the following staff: Patricia Martinek, Environmental Planning and Research; Brad Beckham, Environmental Programs Manager; Del Walker, Director of Staff Braches; Cheryl Wright, Procurement Services Manager; Johnny Olson, Maintenance and Operations; and Joe Mahoney, Facilities Management.	CDOT Greening Government Steering Committee, Executive Management, other CDOT divisions as needed	EO D0011 & D0012 07
2	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Develop a schedule for the CDOT Greening Government Steering Committee to meet. The meetings should take place at least once in between each Greening Council meeting.	The next Greening Council meeting is expected to take place in early 2008.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07
3	Implement	Designate an	Designate an energy	Each agency and	CDOT	D0012 07 –

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
	Greening State Government Initiative	energy management liaison	management liaison within CDOT. This person will be trained by the GEO regarding the implementation of best energy management practices. This person will be responsible for working with the Greening Council and the GEO on state renewable energy projects including wind, biomass, geothermal, and solar on state facilities.	department is directed in the Governor's EO to designate an energy management liaison.	Greening Government Steering Committee	reduction of state energy consumption
4	Implement Greening State Government Initiative	Identify greening actions to be implemented	Review the Pre-Implementation Plan developed for CDOT Headquarters. Determine which green actions from Table 4 and 5 should be implemented within CDOT. Use the questions in Table 3 to determine which recommended green actions have the greatest benefit and should be implemented. Include those green actions in the statewide CDOT Implementation Plan that will be submitted to the Greening Council after completion.	Using Table 3 in the Plan, determine which green actions will be implemented, who is responsible for implementing each green action, and what timeframe for completion will be assigned. This exercise will help CDOT identify short-term and long-term actions.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07
5	Implement Greening State Government Initiative	Identify greening actions to be implemented	Review the Pre-Implementation Plan developed for CDOT Property Management. Determine which green actions from Table 4 should be implemented within CDOT. Use the questions in Table 3 to	Using Table 3 in the Plan, determine which green actions will be implemented, who is responsible for implementing each green action, and what	CDOT Greening Government Steering Committee, Property Management	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			determine which recommended green actions have the greatest benefit and should be implemented. Include those green actions in the statewide CDOT Implementation Plan that will be submitted to the Greening Council after completion.	timeframe for completion will be assigned. This exercise will help CDOT identify short-term and long-term actions.		
6	Implement Greening State Government Initiative	Identify greening actions to be implemented	Review Table 2 in the Property Management Plan and the Headquarters Plan which summarizes the green actions implemented by certain CDOT divisions or locations. Determine if those green actions could be implemented within other divisions of CDOT.	Table 2 of both pre-implementation plans highlights green actions that have been implemented, and perhaps some of these best practices can be shared throughout CDOT statewide.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07
7	Implement Greening State Government Initiative	Implement a system to track all the requirements of the Executive Orders	Work with Information Technology and other CDOT divisions to understand the functions of the different SAP modules. The areas to look at that could potentially relate to implementing the Executive Orders include: Materials Management, Human Resources, Plant Maintenance, Real Estate, Sales and Distribution, Learning Solutions, Business Data Warehouse. Identify reporting capabilities and whether or not SAP reports queries need to be developed. Identify what data from within	The CDPHE will have a database that tracks the progress of all state agencies in reaching the requirements of the Executive Orders. Information will need to be reported up to the CDPHE via the Greening Council on an annual basis.	CDOT Greening Government Steering Committee, Information Technology, other CDOT divisions as needed, division heads responsible for SAP training on specific modules	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			the SAP system needs to be included in the reports. Determine if the SAP reporting capabilities will work to track the requirements of the executive orders or if a different system would work better. Base the decision on needs, cost, budget, training time, etc.			
8	Petroleum Fuel Consumption	Compile baseline information for fiscal year 2005-2006	Develop a baseline in gallons for petroleum consumed in State managed vehicles for fiscal year 2005-2006. Exclude vehicles for law enforcement, road maintenance, and highway construction from this baseline data.	SAP was not implemented at this time, so perhaps this information is present in whatever software or tracking method was in place prior to SAP. Or perhaps this information can be obtained from accounts payable.	CDOT Greening Government Steering Committee, Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
9	Petroleum Fuel Consumption	Compile 2006 – 2007 consumption data	Compile consumption data for gallons of petroleum consumed for non-exempt State managed vehicles for fiscal year 2006-2007 (excludes vehicles for law enforcement, road maintenance, and highway construction).	Since SAP is not fully implemented, CDOT may need to utilize the same method of data collection when determining 2005-2006 baseline data.	Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
10	Water and Energy Conservation	Compile baseline data for 2005-2006 water and energy consumption	Work with Facilities Management and Property Management to compile baseline data for 2005-2006 water and energy consumption.	Joe Mahoney in Facilities Management has access to data on consumption at Headquarters. He stated that Johnny Olson could provide	CDOT Greening Government Steering Committee, Facilities Management,	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				similar data for maintenance buildings.	Property Management	20% by 2012.
11	Water and Energy Conservation	Compile consumption data for 2006-2007 water and energy consumption	Work with Facilities Management and Property Management to develop a uniform system to make sure water and energy consumption for all CDOT-owned buildings are being tracked accurately. Currently, tracking of energy and water consumption is taking place within Property Management and Facilities Management. Make sure these numbers are being combined for accurate consumption reporting for 2006-2007 data.	Joe Mahoney in Facilities Management maintains records on consumption at Headquarters. He stated that Johnny Olson could easily pull these numbers together for the maintenance and other CDOT-owned buildings. Leased buildings would require separate records collection.	CDOT Greening Government Steering Committee, Facilities Management, Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
12	Paper Consumption	Compile baseline data for 2005-2006 paper consumption baseline and 2006-2007 paper consumption data.	Determine how much paper was consumed for fiscal year 2005-2006 (both paper without recycled content and paper with more than 30% recycled content).	Each division is responsible for purchasing their own paper when less than \$5000 is being purchased. This information may be easier to compile by contacting the approved vendors used by each division.	CDOT Greening Government Steering Committee, all CDOT divisions	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
13	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Review the August 2006 State of Colorado Greening Government Status Report. Determine what statements	Some of the actions that CDOT reported in the August 2006 status report have not yet	CDOT Greening Government Steering	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			reported in the status report need to be implemented or reinstated.	been implemented or are no longer being implemented.	Committee	

Table 5: Recommended green actions and tasks to be implemented by CDOT Divisions within Headquarters.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
1	Implement Greening State Government Initiative	Give some incentives to implementing the requirements of the Executive Orders	Work with Human Resources to determine what, if any, additional incentives can be offered to CDOT regions / employees who go out of their way to make an effort towards meeting the requirements of the greening government executive orders. Consider adding greening IPOs to employee goals.	Some ideas discussed include extra time in the morning to shower if an employee bikes to work. Other options could include special flexibility with flex time hours, achievement awards, and/or a Greening awards program. Get regional support from director level executive management.	CDOT Greening Government Steering Committee, Human Resources, individual supervisors	EO D0011 & D0012 07
2	Implement Greening State Government Initiative	Start implementing the requirements of the Executive Orders	Work with the CDOT EMS Steering Committee to determine how the requirements of the Executive Orders can be integrated into the goals and objectives of the EMS.	Currently, the EMS manages CDOT's MS4 Construction Program permit requirements; however, CDOT intends to expand the EMS to cover CDOT's activities statewide.	CDOT Greening Government Steering Committee, CDOT EMS Steering Committee	EO D0011 & D0012 07
3	Implement Greening State Government	Start implementing the requirements of the Executive	Work with the appropriate CDOT divisions and executive management within CDOT to	Each agency and department is directed in the Governor's EO to	CDOT Greening Government	EO D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
	Initiative	Orders	develop and implement policies on materials management, purchasing, and resource management.	develop and implement materials management, purchasing, and resource management policies that minimize impact on public health, the environment and natural resources	Steering Committee, CDOT personnel responsible for policy development, other CDOT divisions as needed	
4	Implement Greening State Government Initiative	Implement a system to track all the requirements of the Executive Orders	Work with all CDOT divisions on incoming RFPs to determine what tracking requirements can be included in bid specifications that help meet the requirements of the Executive Orders.	CDOT needs to start tracking type and quantity of waste generated, type and quantity of items recycled, total paper purchased, paper purchased with at least 30% recycled content, environmentally preferable products purchased, types and quantities of fuels. Many of these items can be tracked by the vendors as part of the contract requirements.	CDOT Greening Government Steering Committee, Purchasing/ Procurement	EO D0011 & D0012 07
5	Implement Greening State Government Initiative	Develop and implement a system to communicate requirements associated with the Executive Orders	Work with Information Technology for use of the intranet to share information about greening the government. Consider assigning a greening government leader in each of CDOT's regional offices to better	The regional greening government leaders should report to Headquarters regarding green actions that have been implemented at the	CDOT Greening Government Steering Committee, Information Technology,	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			facilitate the greening government process.	regional levels.	other CDOT divisions as needed	
6	Implement Greening State Government Initiative	Identify greening actions to be implemented	Look at what other state transportation departments have implemented regarding the environmental topics in this Plan. Determine if their actions could be successfully implemented within CDOT. If so, work with the appropriate CDOT divisions and create green actions that will be included in statewide CDOT Implementation Plan.	Table 3 of the Report and Tech Memo 1 of this research project summarize EMS efforts implemented by other state transportation agencies. The New Hampshire DOT utilizes a contractor to hydro-strip sheeting metal from worn aluminum traffic signs. The sign blanks are returned and reused and are 40% less expensive than new signs.	CDOT Greening Government Steering Committee, all CDOT divisions	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
7	Implement Greening State Government Initiative	Clarify responsibility for specific functions	Clarify responsibility for certain tasks that overlap between Information Technology and Facilities Management. Develop a plan so the CDOT divisions communicate with each other and abide by the same policies or procedures. This will encourage uniformity and help to eliminate confusion. Ensure tracking systems regarding the requirements of the Executive Orders include input from both Information Technology and	Currently, Information Technology and Facilities Management support the management of technology-related activities. Facilities Management handles copiers and the equipment in the Print Shop.	CDOT Greening Government Steering Committee, Information Technology, Facilities Management	EO D0011 & D0012 07

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Facilities Management.			
8	Petroleum Fuel Consumption	Report to the Greening Council on an annual basis	Report to State agency progress made to date towards achieving the goal of reducing petroleum consumption. If the baseline 2005-2006 and fiscal year 2006-2007 numbers are not accurate, report the reasons why and explain whether or not there are planned future implementations that will help make these numbers more accurate (SAP).	This consumption number may not be accurate, but since the deadline to achieve the goal is 6/30/12, these numbers can be modified in a future annual report to the Greening Council. Let the Greening Council know that is your intention.	CDOT Greening Government Steering Committee	EO D0012 07 – State agencies shall report back to the Greening Council on an annual basis
9	Petroleum Fuel Consumption	Set up a system for obtaining more accurate data for future petroleum consumption.	Verify that the bulk storage consumption for each region is being entered into SAP so it is included in the consumption data.	80% of the fuel consumed by CDOT is purchased commercially. The rest is from bulk storage sources and consumption is tracked used fuel logs and entered manually into SAP by each region.	Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
10	Petroleum Fuel Consumption	Set up a system for obtaining more accurate data for future petroleum consumption.	Contact all commercial stations where Ride Express fuel cards are used and verify that the reports they set up accurately reflect the type of fuel purchased.	Reports from commercial fuel vendors are used to track fuel purchased in SAP. Some areas, specifically Craig, are billing inaccurately (ex: reports state gasoline is sold when actually diesel was purchased).	Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
11	Petroleum Fuel	Set up a system for	Work with Information	Per the executive	Fleet Vehicles,	EO D0011 &

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
	Consumption	obtaining more accurate data for future petroleum consumption.	Technology to develop a reporting structure in SAP that can identify fuel consumption of State vehicles (excluding vehicles for law enforcement, road maintenance, and highway construction).	order, this report should include only non-exempt vehicles. For accuracy, the report should be able to track diesel and gasoline separately from any biodiesels and other alternatives.	Information Technology	D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
12	Petroleum Fuel Consumption	Revisit 2005-2006 baseline and 2006-2007 consumption data prior to submitting the next annual report to the Greening Council.	Review previous numbers taking into consideration any corrections made to the data (based on commercial station reports corrected for accuracy, tracking report development in SAP, historic data being uploaded into SAP, etc.). If needed, update your past data with the Greening Council.	It is important to retroactively correct initial data submitted since your 25% reduction goal by 2012 is based off of your baseline 2005-2006 data.	CDOT Greening Government Steering Committee	EO D0012 07 – State agencies shall report back to the Greening Council on an annual basis.
13	Petroleum Fuel Consumption	Encourage the use of alternative fuels.	Compile a list of CDOT fleet vehicles. Identify how many / which vehicles can run off of E-85, propane, biodiesel, CNG, or other alternative fuels. Mark those vehicles as to which fuel types they can utilize, and train employees who use those vehicles on the locations of alternative fuel stations. Provide maps of the alternative fuel stations in the vehicles. Provide tracking logs in the vehicles to track consumption of the alternative fuel for flex fuel	An up to date alternative fuel station locator can be found at http://afdcmap2.nrel.gov/locator/ Information on site locations can also be obtained by calling State Fleet at 1-800-356-3846 or 303-866-5566. An education plan including the labeling of state vehicle will be developed by the Greening Council.	Fleet Vehicles, State Fleet	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			vehicles. The EO directs all departments to set a goal to fuel flex vehicles at least 50% of the time with alternative fuels.	The DPA or State Fleet may have tracking information on the number of E-85 vehicles purchased by each agency.		
14	Petroleum Fuel Consumption	Encourage the use of alternative fuels	Create a biodiesel team across the 6 regions (utilize future videoconferencing capability). Work with other CDOT regions to share best practices and lessons learned regarding biodiesel. Determine which diesel vehicles and equipment can be fueled with a blend of at least B20 (20% biodiesel and 80% petroleum diesel). The EO directs all agencies to utilize B-20 in diesel burning vehicles whenever available.	Region 4 / NE Colorado has been utilizing biodiesel and has identified that an agitator is needed to stir the biodiesel. Lessons learned and shared best practices will make the transition to biodiesel easier. The Alternative Fuel Use Requirement of B20 is subject to fuel availability and cost.	CDOT Regions 1 through 6, and HQ	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012 & SB 06-016 – Alternative Fuel Use Requirement
15	Petroleum Fuel Consumption	Encourage the use of alternative fuels.	Explore what vendor incentives are in place to use biodiesel or other alternative fuels, and work these incentives into the bidding process.	The Alamosa / Region 5 area will start to run Biodiesel from Greeley Blue Sun, who offers incentives.	Fleet Vehicles, Purchasing/ Procurement	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
16	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Encourage drivers to eliminate idle time whenever possible to reduce fuel consumption.	Drivers can reduce idle time in parking lots by turning off their engines while eating lunch. Also, drivers can reduce idle time in the winter by not letting their engines run in	Fleet Vehicles with assistance from Shop Supervisors	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				order to keep the cab warm.		
17	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Perform a needs assessment for each region to determine if vehicles with high fuel consumption can be replaced with vehicles with low fuel consumption. Perhaps some SUVs can be replaced with sedans or hybrids. Set a goal to reduce the number of SUVs in the fleet. The EO directs all agencies to acquire hybrid gas/electric high efficiency vehicles, alternative and flex fuel vehicles, and other fuel efficient / low emission vehicles whenever practicable.	The Shop Supervisors for each region act as Fleet Manager for that region. There are 9 shop supervisors that meet occasionally at roundtable discussions.	Fleet Vehicles with assistance from Shop Supervisors	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
18	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Identify pre-1996 light duty vehicles in fleet that have a fuel efficiency rating of less than 25 mpg. Give priority to replacing these vehicles and consider replacing them with hybrids, alternative flex fuels, or other low-emitting vehicles.	This is also a requirement of the Energy Policy Act – Alternative Fueled Vehicle (AFV) Acquisition Mandate. 75% of model year 2000 and beyond vehicles purchased each year by State agencies with more than 50 light-duty vehicles must be AFVs.	Fleet Vehicles, Purchasing/ Procurement	EO D0012 07 - Cut petroleum use in state vehicles by 25% by June 30, 2012. & EPA Act 507 - Alternative Fueled Vehicle (AFV) Acquisition Mandate
19	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Review justification requirements for purchasing SUVs and trucks (less than one	The Greening Council was formed under Owens' EO D005 05 to	Fleet Vehicles, CDOT Greening	EO D0011 & D0012 07 – Cut petroleum use in

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			ton). Determine if the State Fleet requirements are looser than CDOT needs. If so, tighten the requirements through development and implementation of a CDOT vehicle policy, or else work with State Fleet to refine their policy. The EO directs all agencies to restrict the purchase of four-wheel drive SUVs.	develop, implement, and augment policies. Perhaps suggestions can be made to State Fleet policies by the Greening Council.	Government Steering Committee	state vehicles by 25% by June 30, 2012.
20	Petroleum Fuel Consumption	Reduce petroleum consumption in current fleet.	Work with the Greening Council and ensure that CDOT ideas uncovered through this research project are reported up to the Greening Council for incorporation into the transportation efficiency audit and resulting improvement process of the state fleet.	By 12/1/07, the Greening Council is required to complete a transportation efficiency audit addressing methods for improving the environmental efficiency of the state fleet. An education plan including the labeling of state vehicles that utilize alternative fuels will be developed by the Greening Council.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
21	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Encourage the development of Transportation Management Associations (TMA) and provide technical assistance to their efforts.	TMA is a group of non-government entities that promote the use of alternative modes of transportation.	Planning	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
22	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Identify opportunities for Planning and Property Management to work together to lease/build office space close to alternative modes of transportation.	Currently, Planning and Property Management only work together to ensure parking is available. By selecting office locations close to public transportation, employees are more likely to utilize public transportation instead of driving.	Planning, Property Management	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
23	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation or reduced driving	Offer incentives to employees for reducing petroleum consumption associated with driving. Offer preferred carpool and hybrid parking at offices. Consider purchasing a fleet of bicycles for employees to utilize when going to meetings or light rail locations.	CDOT used to offer preferred carpool parking, but it is no longer recognized.	Planning, Human Resources	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
24	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Include information on alternative modes of transportation in employee paycheck/stub envelopes.	Ensure all employees are aware of the commuter program.	Planning, Human Resources	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
25	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Determine if switching to Eco Pass will encourage additional CDOT employees to utilize alternative transportation to work. Work with Human Resources, Planning, and possibly DRCOG to administer the survey.	CDOT is planning on performing a survey before deciding whether or not to purchase Eco Passes.	Planning, Human Resources	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
26	Petroleum Fuel Consumption	Encourage the use of alternative modes of transportation	Promote a Demonstration of Alternative Transportation Day where employees can learn how to use alternative transportation to travel to meetings and to and from home.	CDOT is considering purchasing Eco Pass. If they decide to purchase Eco Passes for employees, this type of training should be available.	All CDOT divisions, Planning	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
27	Petroleum Fuel Consumption	Reduce fuel used for vehicles while traveling on state business	Reduce fuel used for vehicles while traveling on state business. All state employees shall give preference to major airports physically close to the destination and close to a mass-transit system. Employees shall use mass-transit when traveling whenever feasible.	These are specific requirements in the Executive Order.	All CDOT employees who travel	EO D0012 07 – Greening of State Fleet Management
28	Energy Conservation	Implement easy energy conserving changes in the offices	Implement simple changes to reduce the amount of energy consumed in the office place. Discourage personal printers at individuals' desks when Energy Star main printers can be utilized. Or else require that Energy Star be purchased. Provide power strips with on/off devices so employees' radios, monitors, and other personal electronics at their desks can be powered off with the click of the power strip. Provide Compact Fluorescent Lightbulbs (CFLs) to employees who have lamps at their desks that currently utilize incandescent (regular) light	CDOT could encourage participants by offering an employee incentive that is allowable by both HR and divisional or regional manager of those employees. IT offers a list of Energy Star recommended printers on the CDOT intranet.	All CDOT divisions	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			bulbs. De-lamp the soda machine. Replace incandescent exit signs with LED exit signs. Replace windows with Energy Star windows.			
29	Energy Conservation	Create energy champs!	Assign volunteer energy champs to various energy conserving tasks – Mark all the power strips and other energy saving items CDOT distributes with an energy distinction or logo that CDOT creates. Assign volunteer energy champs the task of circulating office areas to turn off power strips at the end of the workday or work week. Determine what equipment is operating and not needed in the evenings (desk fans, printers, desk lights, bathrooms lights). Turn this equipment off, or work with janitorial to turn it off after cleaning is complete in the evenings.	CDOT could encourage volunteers by offering an employee incentive that is allowable by both HR and divisional or regional manager of those employees.	All CDOT divisions, Facilities Management	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
30	Energy Conservation	Change human behavior	Consciously turn off lights in offices, conference rooms, kitchens, bathrooms when not being used. Consider installing motion detector sensors for rooms that are not used frequently.	Train employees to be more energy conscious at work. It may be easier to influence their habits at work by encouraging energy conserving behavior at home.	All CDOT divisions	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
31	Energy Conservation	Change human behavior	Develop and implement an employee energy challenge to	Train employees how to be more energy	All CDOT divisions,	EO D0011 & D0012 07 –

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			increase employee awareness. Have each division challenge their staff to track their personal energy consumption for at least the past year. Challenge them to reduce their own consumption. Find a charity that would be willing to accept regular light bulbs. Create a donation box for employees to bring in all their incandescent (regular) light bulbs after they have changed them out. Create an employee suggestion box.	conscious. Supply them information and make the process easy for them. Provide them with information about the actual energy and financial savings from someone who has made their house more energy efficient. Supply incentives for challenge winners.	Human Resources	Reduce energy consumption by 20% by 2012.
32	Energy Conservation	Reduce the environmental impact of existing buildings	Implement quick fixes such as additional door stripping and better seals to minimize air leaks in CDOT buildings.	There is a big gap by the front door of the DTD building. Staff utilizes space heaters to compensate for the difference in temperature caused by the air leaks.	Facilities Management	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
33	Energy Conservation	Encourage energy efficiency	Work with the Metro Planning Organization to give incentives for energy efficient projects.	Currently, anything within Federal Guidelines is acceptable.	Planning	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
34	Energy Conservation	Include green requirements in bid specifications	Work with FHWA to determine what can be included in bid specifications that help meet the Executive Order requirements. Require that funds for programs like the Congestion Mitigation Air Quality Program (CMAQ)	CDOT is currently responsible for distributing Federal Highway Administration funds. There are no policies in place that require the funds be	Planning, Purchasing / Procurement	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			include a specific percentage of funds be used for energy efficient programs.	used for environmentally friendly services.		
35	Energy Conservation	Reduce energy consumption	Develop general computer training that teaches employees how to set monitors to sleep after a few minutes of inactivity.	Monitors are currently set up by Information Technology to sleep after 30 minutes of inactivity.	Information Technology	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
36	Energy Conservation	Reduce the environmental impact of existing buildings	Contact the Governor’s Energy Office (GEO) to review the CDOT RFP and any contractual language in the performance contract. The number to the Governor’s Energy Office is 303-866-2201; contact is Seth Porter. The Greening Government Manager will be ensuring that each agency has developed an energy management plan by January 2008.	The GEO consists of expert staff that specializes in reviewing performance contracts and performance payback in order to maximize gains. This is a free service offered to State agencies.	Facilities Management, Purchasing/ Procurement	EO D0014 03 – Requires state agencies to initiate performance contracts where opportunities exist to better utilize budgets; Executive Order D 005 05 – Reduction of state energy consumption
37	Green Building (energy conservation, water conservation, material use)	Incorporate green building practices into Facilities Management	Work with Property Management to identify the green building practices that relate to the activities of Facilities Management. Identify how Facilities Management and Property Management can work together to better meet the goals of LEED and the Executive Orders. Ensure tracking systems include input from both Facilities Management and	Many of the elements in LEED, if implemented, will contribute towards meeting the specific goals in the Executive Orders. This task will be addressed in more detail as part of Phase 2 of this project.	Facilities Management, Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Property Management.			designing new construction; EO D0011 & D0012 07 – Greening of State Government
38	Water and Energy Conservation	Reduce the environmental impact of existing buildings	Work with the Regions and with Property Management and/or Facilities Management regarding energy and water conserving initiatives that could be implemented at rest stops (efficient light bulbs, light sensors, vending machine lamps, faucet aerators, flow restrictors in toilets).	It is unclear who is responsible for rest stops - Regions, Facilities Management, or Property Management.	Facilities Management, Property Management, Facilities Management, CDOT Regions	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
39	Water Conservation	Set up a system for obtaining more accurate data for future water consumption.	Install a system to measure the gallons of well water consumed at CDOT Headquarters. Include the consumption of well water in the total gallons of water consumed by CDOT. This information would be reported to the CDOT Greening Government Steering Committee, then reported to the Greening Council for inclusion in an annual report to the Governor.	Currently Headquarters utilizes well water and city water. Headquarters is not tracking consumption of well water in the total gallons of water consumed.	Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
40	Water Conservation	Reduce the environmental impact of existing buildings	Contact Denver Water to perform a free water audit to determine if water consumption can be reduced at	The water auditor will determine which fixtures inside the buildings can be fitted	Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Headquarters. The auditor at Denver Water is Henry Young and he can be reached at 303-525-1451.	with aerators to reduce the flow, and he will provide and install these aerators for free. He will also audit sprinkler systems, meters, or other systems to determine if the system is working properly and efficiently. The Denver Water records show that Headquarters has three buildings as water accounts.		10% by 2012.
41	Water Conservation	Implement easy water conserving measures	Install flow restrictors on toilets, and install flow restricting aerators at rest stops and across offices.		Facilities Management, Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
42	Water Conservation	Increase employee awareness	Implement a water conservation awareness and outreach program, and implement training. Solicit employee ideas. Place stickers in restrooms encouraging water conservation.	Training modules are available at www.co.train.org . Additional water conservation websites are www.ourwater.org and greenco.org .	Facilities Management, Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
43	Water Quality	Increase awareness about protecting water quality	Identify where manholes and storm gutters outlet and label them appropriately. If they outlet to storm sewer (not sanitary sewer), then stencil around them to indicate that they outlet to waterways without first being	The manhole grate cover for the triple basin system in the shop wash bay area indicates that water outlets to the storm sewer. Personnel did	Facilities Management	State of Colorado Greening Government Implementation Guide

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			treated.	not think this was the case.		
44	Materials and Resource Management	Quantify recycling efforts	Determine what items are being recycled and in what quantities. For paper, steel, and mixed waste streams, this information should be available through the vendors. Ensure that future contracts with recycling vendors include requirements to tally up the total pounds of recycled materials generated.	A mixed stream recycling program was implemented at Headquarters. Most shops recycle steel, tires, used oil.	CDOT Greening Government Steering Committee, Environmental, Purchasing / Procurement, Maintenance	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
45	Materials and Resource Management	Quantify waste generation	Determine how much waste and what types of waste are being generated by CDOT activities. Ensure that future contracts with waste haulers include requirements to tally up and report the type and total pounds of waste being picked up.	This includes waste being generated by regional offices, maintenance shops, and all activities performed by CDOT.	Fleet Vehicles, Facilities Management, Property Management	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
46	Materials and Resource Management	Set up a system to track waste from maintenance activities more accurately	Track waste generated from maintenance activities. Ensure that waste generated by the maintenance of non-CDOT vehicles is not counted in the total waste generated by CDOT. Either stop performing maintenance on non-CDOT vehicles, or else track the waste generated by non-CDOT vehicles so it can be subtracted from the total waste generated. Also, implement a system to	Shop managers do a daily work log in SAP. Once in a while, maintenance is performed on non-CDOT vehicles. For example, a Division of Wildlife or Department of Revenue vehicle is serviced and that agency is billed by CDOT. General trash that is picked up from	Fleet Vehicles	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			track general trash that is picked up from the roads. This should not be tracked as general trash that CDOT generates.	the roads is accounted for in waste streams generated by CDOT.		
47	Materials and Resource Management	Identify opportunities to reduce waste	Determine if any of the wastes currently being disposed of can be reduced, re-used, recycled, or composted. Research recycling or re-use options that are available for the different waste streams. Establish waste reduction / recycling goals.	Focus recycling efforts on the most commonly generated materials. Also, look across CDOT to identify opportunities. Some shops recycle used oil filters for steel while some do not.	CDOT Greening Government Steering Committee , All CDOT divisions	EO D0011 & D0012 07 – Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
48	Materials and Resource Management	Set up a system for obtaining more accurate data for future Information Technology equipment waste generated	Track the percentage of Information Technology equipment that is recycled/reused or disposed of through Juniper.	Currently, Information Technology only knows the amount of equipment that is given to Juniper. They do not receive information on the amount of waste generated and recycled.	Information Technology	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
49	Materials and Resource Management	Identify opportunities to reduce waste	Work with Juniper to determine if old machines and cell phones can be donated to other state agencies or non-profits rather than being thrown away as trash. Include in the bid specification that equipment should be donated if it cannot be sold.	Currently, CDOT pays \$6-\$8 per machine for equipment that Juniper cannot re-sell and is disposing of as trash.	Information Technology, Purchasing / Procurement	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
50	Paper Consumption	Set up a system to track consumption	Set up a system within CDOT to easily track future paper	Each region has a business office that	CDOT Greening	Act 24-103-207 – State agencies

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
		for future paper consumption reporting.	purchases – both total paper purchased and paper purchased with more than 30% recycled content.	makes purchases of less than \$5000. There are 10 or 12 CDOT business offices statewide. Work with the business offices to implement a reporting system for paper purchases. Alternatively, work with purchasing to require the vendors to provide this information as a contract requirement.	Government Steering Committee, Business Offices, Purchasing / Procurement	are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
51	Paper Consumption	Reduce paper consumption	Determine if electronic signatures can replace wet signatures. Pose this question to the Greening Council. There may be the potential to influence the upcoming administrative rules regarding use of electronic signatures by state agencies that will be coming from the Secretary of State.	The Uniform Electronic Transaction Act (UETA) allows for use of electronic signatures, and the Secretary of State (SoS) was granted broad rulemaking authority under UETA. The SoS will be adopting administrative rules that apply to all state agencies. More information can be obtained from barbara.groth@sos.state.co.us	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
52	Paper Consumption	Reduce paper consumption	Change the print shop work order form so it can be submitted electronically rather	Currently, the work order form available on the CDOT intranet	CDOT Greening Government	EO D0011 & D0012 07 - Reduce paper

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			than requiring a printed version.	cannot be submitted electronically. Orders must be submitted to the Print Shop by printing out the actual form.	Steering Committee, Print Shop, Information Technology	consumption by 20% by 2012.
53	Paper Consumption and Material Use	Reduce paper consumption and waste	Set all color printers to print double-sided as the standard setting. Ensure that all printers are in fact set to print double-sided as the standard setting.	Printing double-sided will reduce paper consumption and waste generated.	Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
54	Paper Consumption and Material Use	Reduce paper consumption and waste	Start tracking the number of desktop printers and reduce the number of desktop printers. For those employees who need desktop printers due to the privacy of the material being printed, encourage the purchase and use of a duplexer. Duplexers will enable double-sided prints without the inconvenience of having to turn the paper around in the middle of the print job.	Desktop printers are usually not capable of printing double-sided which increases the amount of paper used. Also, the desktop printer toner cartridges are replaced more frequently and create more waste.	All CDOT divisions, Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
55	Paper Consumption and Material	Reduce paper consumption and waste	Consider installing projectors in conference rooms so electronic agendas can be utilized.	Currently, printed versions of all handouts are	Information Technology	EO D0011 & D0012 07 - Reduce paper

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
	Use			distributed for meetings.		consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
56	Paper Consumption and Material Use	Reduce paper consumption and waste	Develop training on reducing paper consumption and waste from computers. Include in the training how to print double-sided on desktop printers; why employees should not print out emails; why employees should not uncheck the default settings in print options, and the environmental benefits of a paperless office goal.	Increase employee awareness about simple easy changes that can help CDOT meet goals regarding waste generation and paper consumption.	Information Technology	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012. Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
57	Waste Reduction	Educate employees on waste reduction	Make information available to employees on how they can reduce and recycle waste generated in their homes. Inform them about resources to stop junk mail received in the office and at home.	Visit www.dmaconsumers.org to get names and addresses off junk mail mailing lists. Contact greendimes.org to purchase a service to do so more efficiently. Email DistributionConcerns@Yellowbook.com to remove your address from the yellow phone	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				book delivery list.		
58	Waste Reduction	Encourage employees to reduce waste	Designate a “re-use area” for employees to re-circulate / reuse unwanted desk supplies. Increase employee awareness through large recycling signs placed where applicable. Publicize waste reduction and recycling data to progress towards meeting goals. Challenge employees to continually improve each year.	Increase employee awareness about simple easy changes that can help CDOT meet goals regarding waste generation.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
59	Waste Reduction and Environmentally Preferable Purchasing	Encourage environmentally preferable purchasing	Work with the DPA to obtain information about recycling / solid waste contracts that may be assessed to assist and improve agency waste reduction programs.	This action step was recommended in the Guide developed by the Greening Council	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Environmental Preferable Products
60	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Change the print shop work order form so there is an option for selecting recycled paper. Specify the requirement for state agencies to purchase recycled content paper on the order form itself to increase employee awareness.	Currently, the order form does not have an area where a customer can select recycled paper options.	CDOT Greening Government Steering Committee, Print Shop	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content
61	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Implement a CDOT policy that mandates printing jobs coming from CDOT to be completed on recycled paper whenever possible.	There are no CDOT policies in place currently, and printing jobs are performed as requested by the customer.	CDOT Greening Government Steering Committee, Print Shop, Director of DTD	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
62	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Work with purchasing and the office supply consortium to further promote the purchase, definition, and availability of green products. Require that all state awarded office supply vendors implement discounts on purchases of green products. Make this a requirement of the contract.	Currently, there are 6 approved office supply vendors. Three of them offer a 1% discount on green products. The office supply consortium consists of multiple agencies including CDPHE, Department of Labor and Employment, Department of Revenue, Department of Corrections, and CDOT.	CDOT Greening Government Steering Committee, Purchasing / Procurement	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content
63	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Develop a uniform office supply order form for use throughout the business offices. Include a column that indicates whether the product being ordered is considered green. Specify the requirement for state agencies to purchase green on the order form itself to increase employee awareness.	This was implemented in the past, but it was discontinued. The current order forms at DTD do not include a green column.	CDOT Greening Government Steering Committee, Business offices	EO D0011 & D0012 07 - Environmental Preferable Products
64	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Work with the employees of CDOT that approve products for the CDOT Specification Book to determine if environmental aspects (ease of recycling, life-cycle, toxicity, etc.) are taken into consideration during the product approval process.	Purchasing indicated that Dave Kotzer heads up the staff that is responsible for product approval and updates to the Approved Products List.	CDOT Greening Government Steering Committee	EO D0011 & D0012 07 - Environmental Preferable Products

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
65	Environmental Preferable Purchasing	Implement better controls on small discretionary purchases	For those purchases that cost less than \$5,000 and do not go through Purchasing / Procurement, implement better controls or procedures to ensure that environmentally sound products are being purchased. These controls or procedures should be enforced for all employees who have purchasing cards or employees who can get reimbursed for using personal funds.	If a shop runs out of an item, an employee can go purchase it with their Purchasing card and have the freedom to select any brand that they want with no written guidelines. Divisions within CDOT can go purchase any type of desktop printer. IT has published guidelines on the CDOT intranet that specify Energy Star models, but these guidelines are not enforced.	Fleet Vehicles, All CDOT divisions, Accounting	EO D0011 & D0012 07 - Environmental Preferable Products
66	Environmental Preferable Purchasing	Include green requirements in bid specifications	Work with all CDOT divisions on incoming RFPs to determine what can be included in bid specifications that help meet the requirements of the Executive Orders for environmental preferable products. Require that bids are submitted on recycled paper, double-sided printing, electronic copies are provided, and are free from unnecessary attachments.	Where applicable, include requirement for recycled materials to be used in the project, Energy Star products to be used, remanufactured items to be used, and other environmental preferable preferences that relate to the bid request.	Purchasing / Procurement, All CDOT divisions,	EO D0011 & D0012 07 - Environmental Preferable Products
67	Environmental Preferable Purchasing	Include remanufactured requirements in bid specifications	Work with Purchasing / Procurement to include in the bid requirements that the suppliers of the large copy	The contractors that supply the large copiers determine the type of toner that those	Print Shop, Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			machines utilize remanufactured toner.	copiers utilize.		Products
68	Environmental Preferable Purchasing	Re-work pricing of recycled content material	Work with Purchasing / Procurement to require a discount on recycled paper purchases when bidding.	The paper contract is renewed every 6 months for re-pricing. Paper is purchased for quantities that exceed \$5000.	Print Shop, Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
69	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Check if there is a Hewlett Packard supported re-manufactured toner that could be used in network printers. Ensure future contracts with Hewlett Packard require use of re-manufactured toners.	All toners are currently recycled, but Information Technology should see if re-manufactured toners are available from Hewlett Packard .	Information Technology, Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
70	Environmental Preferable Purchasing	Use local materials	Work with all CDOT divisions on incoming RFPs to determine what can be included in bid specifications regarding local materials. The requirement for local materials cannot impact free trade.	If possible, include a requirement for local materials. A discussion with purchasing identified that CDOT cannot require that local companies respond, but perhaps CDOT can require that a certain percentage of local materials be incorporated in the project.	Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
71	Environmental Preferable Purchasing	Encourage environmentally preferable purchasing	Designate a person within Purchasing / Procurement to stay abreast on environmental preferable purchasing advancements and decisions	Purchasing/ Procurement has been thinking about designating a person to stay abreast	Purchasing / Procurement	EO D0011 & D0012 07 - Environmental Preferable Products

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			made within state government. This person should work with DPA to stay on top of environmentally preferable purchasing news. This person should participate in green purchasing conferences, training, workshops, and appropriate awards and recognition programs. Assign this person the responsibility of sharing information with the other members of Purchasing/ Procurement.	environmental preferable purchasing topics.		
72	Environmental Preferable Products	Encourage environmentally preferable purchasing	Designate a person within Information Technology to track environmentally preferable purchases and green efforts implemented that relate to technology. Have this person report this information to the CDOT Greening Government Steering Committee for reporting to the Greening Council.	This person should work closely with the Regional Analysts to ensure that green information is tracked across CDOT statewide.	Information Technology	EO D0011 & D0012 07 - Environmental Preferable Products

- **Management Systems**

4.1 Integrating Environmental Impacts into Key Decision Making Processes

CDOT is in the process of implementing an Environmental Management System (EMS) to manage environmental aspects associated with stormwater runoff from construction activities as well as to protect the quality of water that is permitted under CDOT's Municipal Separate Storm Sewer System (MS4) permit. The EMS sets up a process to integrate environmental impacts into key decision making processes through its management review function. The EMS was developed under the guidance of the American Association of State Highway and Transportation Officials (AASHTO), and information about CDOT's EMS will be uploaded onto the AASHTO website for other transportation departments to utilize when implementing their own management systems.

The EMS is in its early stage of implementation and is still within the first cycle of the Plan-Do-Check-Act continual improvement cycle for EMS implementation. The EMS implementation is currently in the internal audit process and has been implemented up to the "check" portion of the Plan-Do-Check-Act continual improvement cycle. Each year, the Regional Erosion Control Assessment Team (RECAT) performs a minimum of 60 field inspections to determine the extent to which EMS requirements are implemented in the field. The results of these internal audits are then reviewed by the EMS Steering Committee as a management review function of the system. The EMS Steering Committee contains representatives from CDOT Engineering, Maintenance, and Environmental from all 6 CDOT Regions and Headquarters. The Steering Committee meets monthly and then again every 6 months to review the results of the internal audits, to trend the audit findings, to evaluate where additional environmental controls should be implemented, and to identify if any changes need to be made to the EMS based on overall efficiency, adequacy, and effectiveness of the EMS. An external audit of the EMS will be performed by AASHTO sometime in 2008. After the EMS Steering Committee performs a management review of the results of the external audit and makes recommendations for modifications to the EMS, a complete Plan-Do-Check-Act cycle will be completed and future improvements to the EMS can be planned.

After the EMS is successfully implemented for CDOT's MS4 Construction Program permit requirements, CDOT intends to expand the EMS to better manage the environmental impacts associated with all of CDOT's activities and operations.

CDOT Research recommends that CDOT identify opportunities to integrate some of the greening government requirements into the future goals and objectives that should be implemented for continual improvement of the EMS.

1. Education and Training of Staff

In order to successfully implement the Plan, CDOT will need to perform training so that all employees are aware of the requirements and goals of the Plan. Many of the recommended green actions, if implemented, will require coordinated efforts by a wide range of employees within CDOT. After the Greening Government Steering Committee determines which green actions from this Plan will be implemented, training needs will be identified and training will be developed and implemented for those employees who are responsible for the completion

of specific tasks. Training will help increase awareness about the goals of the Plan while providing employees with an understanding of how implementing the goals will help reduce the environmental impacts of CDOT's activities.

- **Tracking Progress and Program / Plan Review**

5.1 Agency Tracking and Reporting Form

CDOT does not currently have a tracking system in place to monitor the requirements of the Executive Orders. However, the Colorado Department of Health and Environment (CDPHE) is implementing a database to track the requirements of the Executive Orders. This database is approximately 80% complete and is expected to be 100% complete by the end of the year. In the near future, the Greening Government Manager will be contacting state agencies to obtain tracking information. It is also expected that the Governor's Energy Office will be contracting out consultants to work with state agencies to develop 2005-2006 baseline data that will be reported to the Greening Council.

CDOT Research has recommended green actions that include implementing systems that can monitor performance indicators for meeting the various Executive Order requirements. These green actions include working with Information Technology to develop better performance indicator tracking systems within SAP. Some examples of performance indicators that relate to each environmental topic discussed in the Guide for state agencies follow:

1. Energy Efficiency
 - Kwh of electricity consumed
 - Therms of natural gas consumed
 - Replacement of energy consuming fixtures
 - Energy savings achieved
 - Energy conservation projects implemented
2. Water Conservation
 - Gallons of city water consumed
 - Gallons of well water consumed
 - Replacement of water conserving fixtures
 - Water savings achieved
 - Water conservation projects implemented
3. Waste Reduction and Recycling
 - Types and quantities in pounds of materials recycled
 - Types and quantities in pounds of waste produced
 - Recycling and waste reduction projects implemented
 - Instances of hazardous waste eliminated
 - Waste reduction savings
4. Environmentally Preferable Purchasing (EPP)
 - Number of contracts incorporating green requirements
 - Amount of paper purchased with 30% recycled product
 - Number of green products purchased
 - EPP projects implemented

5. Transportation

- Gallons of gasoline consumed
- Gallons of diesel consumed
- Gallons of biodiesel consumed
- Gallons of E-85 consumed
- Number of hybrid or flex fuel vehicles in the vehicle fleet
- Reduction in petroleum products
- Vehicle miles traveled
- Vehicle miles not traveled due to alternative transportation
- Petroleum use reduction projects implemented

5.2 Continuous Improvement

CDOT plans to achieve continuous improvement through further implementation of its EMS to include additional programs and divisions. Furthermore, the annual tracking to the Greening Council on progress made towards achieving the goals of the executive orders will help encourage improvements from year to year. The plan will be updated every year as CDOT makes progress on existing greening government initiatives and identifies new greening government opportunities.

APPENDIX F COLORADO DEPARTMENT OF TRANSPORTATION PROPERTY MANAGEMENT GREENING GOVERNMENT PRE-IMPLEMENTATION PLAN

Date: June 1, 2007
Agency Coordinator: Patricia Martinek
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- **Agency Information, Impact Identification and Greening Government Team**
 - **Agency Description and Scope**

The Colorado Department of Transportation (CDOT) is responsible for a 9,156 mile highway system, including 3,714 bridges. Each year, this system handles over 26.1 billion vehicle miles of travel. CDOT maintenance forces take care of the highway system, plowing snow and repairing pavement. Last winter, CDOT employees plowed 5.548 million miles of highway. They also repaired road damage and potholes, using more than 330,371 tons of asphalt and 1.97 million gallons of liquid asphalt in preservation activities. (3)

CDOT's Vision: To enhance the quality of life and the environment of the citizens of Colorado by creating an integrated transportation system that focuses on moving people and goods by offering convenient linkages among modal choices.

CDOT's Mission: To provide the best multi-modal transportation system for Colorado that most effectively moves people, goods, and information.

CDOT's Values:

PEOPLE We value our employees! We acknowledge and recognize the skills and abilities of our coworkers, place a high priority on employee safety, and draw strength from our diversity and commitment to equal opportunity.

RESPECT We respect each other! We are kind and civil with everyone, and we act with courage and humility.

INTEGRITY We earn Colorado's trust! We are honest and responsible in all that we do and hold ourselves to the highest moral and ethical standards.

CUSTOMER SERVICE We satisfy our customers! With a can-do attitude we work together and with others to respond effectively to our customer's needs.

EXCELLENCE We are committed to quality! We are leaders and problem solvers, continuously improving our products and services in support of our commitment to provide the best transportation systems for Colorado.

CDOT research developed the Property Management Greening Government Pre-Implementation Plan (Plan) as part of a research project to identify CDOT's activities that provide opportunities to green CDOT. To green CDOT means to implement green actions that will reduce the environmental impact of CDOT's activities. Greening of CDOT supports the two Greening of State Government Executive Orders signed by Governor Ritter on April 16, 2007 and the 2006 State of Colorado Greening Government Planning and Implementation Guide (Guide) prepared by the Colorado Greening Government Coordinating Council. The Guide was developed as guidance for state agencies to implement previous greening the government initiatives, and the Guide focuses on the following environmental topics: (13)

- Energy Efficiency
- Water Conservation and Quality
- Waste Reduction and Recycling
- Environmental Preferable Purchasing
- Transportation

Property Management was chosen due to the significant environmental impacts resulting from the construction, maintenance, and operation of buildings. The Plan focuses on the environmental impacts of buildings, both owned and leased. The overall goal of the Plan is to identify opportunities to implement green building strategies into the activities of Property Management. Additionally, green actions will be identified that can help Property Management contribute to achieving the goals of the greening government executive orders.

Property Management within CDOT consists of 13 employees that are located at the Camp George West Campus in Golden, Colorado. The team consists of 3 architects, 2 property leasing specialists, 2 administrative staff, 1 full-time asbestos environmental specialist, and 3 hazardous waste environmental specialists.

The primary functions of Property Management include:

- Day-to-day management, maintenance, and operation of 4 CDOT buildings
- Maintenance and operation of approximately 800 maintenance buildings
- Design of new CDOT buildings for regional use
- Leasing of CDOT houses, duplexes, trailers, and concrete pads out to CDOT employees
- Environmental assessments and compliance with environmental factors such as asbestos and groundwater contamination issues
- Negotiations with Federal Highway Administration (FHWA) to determine if federal funds will be used for rest areas or if CDOT regions are responsible for rest areas

▪ **Environmental Impacts of Buildings and Greening Government Requirements**

The activities of Property Management offer multiple opportunities to implement various greening government practices. Since the main function of Property Management is the design, operation, maintenance, and management of buildings, the Plan primarily focuses on buildings and the associated opportunities to implement green practices.

Buildings in the United States have a huge impact on the natural environment. From the planning stage through construction, operation and maintenance of the buildings, there are many opportunities to reduce the environmental impacts associated with buildings as well as to reduce the associated costs of maintaining and operating those buildings. According to the U.S. Green Building Council (USGBC) website, buildings in the United States account for: (15)

- 70% of electricity consumption
- 30% of greenhouse gas emissions
- 65% of waste output
- 12% of potable water consumption

While this specific data on environmental impacts from buildings represents both public and private buildings in the United States, much opportunity exists in state government to reduce the environmental impacts associated with the construction, operation and maintenance of state buildings. In Colorado, the state government is responsible for overseeing over 60 million square feet of property and more than 5,000 buildings. (13) If these buildings are built, operated, and managed in a more sustainable manner, state government can contribute to a reduction in the overall environmental impact resulting from buildings in the United States.

Leadership in Energy and Environmental Design (LEED) is a sustainability rating system for buildings that was developed by the USGBC, a non-profit organization whose purpose is to transform the building marketplace to sustainability by providing the building industry with consistent, credible standards for what constitutes a green building. LEED addresses all building types including existing buildings, new construction, commercial interiors, core & shell, homes, neighborhoods, and specific applications such as retail, multiple buildings/campuses, schools, healthcare, laboratories and lodging. (15)

The specific standards of LEED that are referenced in the greening government executive orders are LEED for existing buildings (LEED-EB) and LEED for new construction (LEED-NC). LEED-EB provides guidelines for operating, maintaining, and managing existing buildings using environmentally sustainable and economically efficient practices. (16) LEED-NC provides guidelines for designing energy and resource efficient new buildings through green building practices. (17) According to the USGBC website, LEED certified buildings reduce energy and water consumption over conventional buildings, encourage the use of local building materials, perform at a lower annual operating cost, create jobs in the local community, provide a healthier indoor environment and increase occupant productivity. (15)

The LEED rating system certifies and scores the design, construction and operation of green buildings at the following four different certification levels, depending on the total credits incorporated into the buildings: LEED Certified, LEED Silver, LEED Gold, and LEED Platinum. The rating system tallies scores for different aspects of efficiency and design in the following categories or credit areas: (17)

- Site Planning
- Water Management
- Energy Management
- Material Use

- Indoor Environmental Air Quality
- Innovation and Design Process

The actual LEED certification process requires paperwork, additional time for preparation and planning, and a certification cost for a third-party to verify that the building project meets high performance standards. However, an agency can adopt LEED and decide to incorporate the elements of the LEED rating system into the design, maintenance and operation of buildings without undergoing the certification process. In doing so, the building will be built green and the environmental impact of the building will be reduced and savings will be realized. According to the USGBC website, the average savings of green buildings include: (15)

1. 30% savings in energy
2. 35% carbon savings
3. 30 – 50% water use savings
4. 50 – 90% waste cost savings

In addition to these quantified savings, green buildings that were built by incorporating elements of the LEED rating system also come with other benefits including increased value, enhanced productivity for occupants, lower operating cost, reduced overall environmental footprint, and demonstration of a commitment to environmental stewardship and social responsibility. (15)

Federal, state, and local government are at the forefront of the green building movement by requiring that buildings be built green using the LEED standards and certification process. The following federal agencies either support the use of LEED or require LEED certification for new federal buildings and federal buildings undergoing major renovations: (18)

- Department of Agriculture
- Department of Agriculture – Forest Service
- Department of Energy
- Department of Health and Human Services
- Department of Interior
- Department of State
- Environmental Protection Agency
- General Services Administration
- National Aeronautics and Space Administration
- U.S. Air Force
- U.S. Army
- U.S. Navy

Additionally, many states and local governments have implemented legislation that requires the use of LEED when designing, building, operating, and maintaining high performance green buildings. (18) The following table summarizes LEED initiatives and requirements currently in place within Colorado both at the state and municipal level.

Table 1: Green building initiatives and requirements in Colorado state and municipal government.

<i>Level of Government</i>	<i>Initiative or Requirement</i>	<i>Summary of Green Building Requirements</i>
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Level of Government	Initiative or Requirement	Summary of Green Building Requirements
State of Colorado	Executive Order D 005 05 Governor Owens (5/15/05)	To the extent applicable and practicable, requires State agencies to adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction. (9)
State of Colorado	Senate Joint Resolution SJR 06-032 (2006)	The General Assembly supports the use of LEED as a design and construction guideline for public and private facilities and urges the state of Colorado and its agencies and departments to design and construct facilities to achieve LEED silver certification. (5)
State of Colorado	Senate Bill 07-051 (4/16/07)	High Performance State Buildings: Requires any new or renovated building whose total project cost includes 25 percent or more in state funds to be designed and built to a high performance green building standard; requires third party certification to a green standard such as LEED and that increased initial costs are regained through decreased operational costs within 15 years. (7)
State of Colorado	EO D0011 07 (4/16/07) Governor Ritter	References D 005 05 to be read in conjunction with this Executive Order; sets goals to be met that relate to credit areas of the LEED rating system. By 2012, State agencies are required to reduce energy consumption by 20 percent at all state facilities, cut paper use by 20 percent, cut water use by 10 percent and cut petroleum use by 25 percent in state vehicles. (10)
State of Colorado	EO D0012 07 (4/16/07) Governor Ritter	References D 005 05 to be read in conjunction with this Executive Order; details implementation of goals specified in EO D0011 07, which relate to credit areas of the LEED green building rating system. (11)

Level of Government	Initiative or Requirement	Summary of Green Building Requirements
City of Boulder	City Council Policy (2001)	All new or significantly renovated city facilities in Boulder are to be built to a LEED Silver level. (18)
City of Denver	State of the City Address 2006, Mayor Hickenlooper	Announced a new action plan for Denver that will require all new public buildings and major municipal renovations to be LEED Silver certified and meet EPA Energy Star Guidelines. (18)
City of Fort Collins	City Council Resolution 2006 – 096 (9/5/06)	All new city owned buildings in Fort Collins will achieve LEED Gold or LEED Silver certification. (18)

▪ **Agency Operational Costs**

The operational costs of Property Management include energy consumption, water consumption, waste disposal, maintenance costs, and contractor costs.

According to the information submitted for fiscal year 2004-2005 for inclusion in the State of Colorado Greening Government Status Report (Report), CDOT had utility expenditures of nearly \$7.5 million. These utility expenditures covered over 2.5 million square feet of CDOT owned properties. (12) The Report did not specify what utilities were included in the reported costs, or how much of each utility was consumed.

Property Management tracks the consumption of energy and water at 3 of the 4 buildings that are day-to-day managed by Property Management and occupied by CDOT. The fourth facility, Camp George West, is in an interagency facility that is managed by Capital Complex so energy and water consumption specific to CDOT is not tracked here. Where possible, Property Management tracks utilities consumed at owned properties that are leased to CDOT employees. The tracking is dependent on where the utility bill is sent and whether the consumption of utilities can be split amongst the locations where it was consumed.

Waste generation includes aluminum and copper wire, construction debris, bulbs, and general trash. Waste is not being tracked consistently across the CDOT owned properties that are managed by Property Management. Paper consumption is not being tracked by Property Management, but could easily be obtained through the vendor for Property Management’s consumption.

▪ **Agency Greening the Government Team Members and Efforts to Date**

Per Executive Order D 005 05, A Colorado Greening Government Coordinating Council (Greening Council) has been formed to promote environmentally sustainable and economically efficient practices in accordance with the goals of the executive order. As stated in the executive order, the Greening Council has been given the responsibility to, “develop, implement, and augment programs, plans and policies that save money, prevent

pollution, and conserve natural resources throughout state government management and operations, including but not limited to source and waste reduction, energy efficiency, water conservation, recycling, fleet operations, environmental preferable purchasing, and establishing state-wide goals to save taxpayers' money and reduce environmental impacts.”
(9)

The Greening Council consists of Angie Fyfe from the Governor's Energy Office serving as the Greening Government Manager and an administrative team. The administrative team consists of the following individuals and their respective state agencies: Patrick Hamel from the Colorado Department of Public Health and Environment (CDPHE), Susan Castellon from the Governor's Energy Office, and Richard Lee from the Colorado Department of Personnel and Administration.

The next Greening Council meeting is expected to take place in early 2008. Prior to the meeting, the Executive Directors of State Agencies will be sent an invitation to the meeting and will be asked to appoint a representative from within their agency to participate in the Greening Council meeting. Between 2005 and 2007, CDOT's representatives included Brad Beckham, Environmental Programs Manager, and Patricia Martinek, Environmental and Planning Research Manager in CDOT's Division of Transportation Development (DTD). In July, 2007, Del Walker, Director of Staff Branches, was CDOT's representative on the Council.

In order to better represent CDOT at the Greening Council meetings and better assist with the implementation of the greening government executive orders, Ms. Martinek has organized a Greening Government Steering Committee within CDOT that will consist initially of the following CDOT employees:

- Patricia Martinek, Environmental and Planning Research Manager
- Brad Beckham, Environmental Programs Manager
- Del Walker, Director of Staff Branches
- Cheryl Wright, Procurement Services Manager
- Johnny Olson, Maintenance and Operations
- Joe Mahoney, Facilities Management

The CDOT Greening Government Steering Committee does not currently contain employees from Property Management. However, Property Management's efforts to date towards greening the government and their interests in green building make them an obvious addition to the Steering Committee. The Property Management Program Manager expressed interest in training her team on green building practices for both new construction and existing buildings. An architect in Property Management expressed some interest in LEED from the design perspective for new construction projects. A property leasing specialist in Property Management expressed interest in potential opportunities to reduce energy and water consumption from a maintenance and operation perspective for existing buildings. All members of Property Management that contributed to this research seemed willing to come up with solutions that their team could implement to meet the goals of the greening government executive orders.

Property Management has already implemented many green measures where possible within the limit of their budgets and contracts, as outlined in the following table.

Table 2: Green actions implemented by Property Management.

	Area of Implementation	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
1	Property Management	Receives emails from State Buildings; attends annual LEED meetings amongst State agencies; receives emails from the American Institute of Architects (AIA) on greening initiatives	Increases knowledge about measures that can be incorporated into new and existing buildings to reduce the overall environmental footprint of the building and to increase sustainability.	EO D 005 05 - Adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction
2	Bidding process / Procurement for Design Build	Have included in bid specifications energy star light and heating fixtures and energy efficient insulation	Reduces energy consumption throughout the operation of the building; reduces maintenance needs by increasing life cycle of bulbs.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
3	New and Existing Buildings	Utilizes recycled cubicle walls when furnishing buildings	Reduces the demand on virgin materials; re-use prevents these items from entering landfills as trash.	EO D0011 & EO D0012 – Environmental Preferable Products; adopt a goal of zero waste from construction of new buildings and operation of existing facilities.
4	4 buildings managed by Property Management	Installed thermostat devices that only allow a 3 degree variance in temperature from the master thermostats, which are set up in zones	Reduces energy consumption needed to heat and cool buildings.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012
5	4 buildings managed by Property	Arranged with cleaning contractors to	Reduces energy consumption needed to light	EO D0011 & EO D0012 – Reduce energy

	Area of Implementation	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
	Management	always turn off lights after they leave a building	buildings while unoccupied.	consumption by 20% by 2012
6	Maintenance buildings	Installed infrared heating tube system	Reduces energy consumption by replacing forced air heating; reduces amount of time needed for heating; increases efficiency.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
7	Maintenance Buildings	Replaced light fixtures with energy star fixtures to replace use of incandescent bulbs with use of compact fluorescent T-8 light bulbs	Uses 2/3 less energy; bulbs last longer; waste generation is reduced.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; adopt a goal of zero waste from construction of new buildings and operation of existing facilities; Environmental Preferable Products
8	Maintenance buildings	Replaced some garage doors with energy efficient windows	Reduces the amount of air flow which increases energy efficiency for heating and cooling; reduces artificial light needed by adding natural light.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products
9	4670 Holly	Installed carpets with recycled material content; low-emitting VOC carpets	Reduces the burden on virgin materials; reduces impact on employee health by improving air quality.	EO D 005 05 - Adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction

	Area of Implementation	Green Actions Implemented	Environmental Benefit(s)	Requirement / Goal
10	4670 Holly	Installed energy management system for HVAC unit	Reduces energy consumption in building.	EO D0011 & EO D0012 – Reduce energy consumption by 20% by 2012; Environmental Preferable Products

2.0 Long-Term Goals / Visions

2.1 Long-Term Goals

CDOT has adopted the following Environmental Ethics Statement:

“CDOT will support and enhance efforts to protect the environment and quality of life for all of Colorado’s citizens in the pursuit of providing the best transportation systems and service possible.”

- CDOT goes beyond environmental compliance and strives for environmental excellence.
- CDOT promotes a sense of environmental responsibility for all employees in the course of all CDOT activities.
- CDOT ensures that measures are taken to avoid or minimize the environmental impacts of construction and maintenance of the transportation system and that mitigation commitments are implemented and maintained.
- CDOT designs, constructs, maintains, and operates the statewide transportation system in a manner which helps preserve and sustain Colorado’s historic and scenic heritage and fits harmoniously into communities and the natural environment.

Long-term greening government goals for CDOT include promoting an overall sustainable system that can help contribute to meeting the goals of the greening government executive orders. The long-term goals for Property Management relate to identifying opportunities to incorporate elements of both LEED-EB and LEED-NC into the processes in place within Property Management of CDOT. Furthermore, long-term goals include identifying and implementing opportunities for Property Management to work with other divisions within CDOT and possibly other state agencies to achieve the specific goals of the greening government executive orders relating to energy consumption, water consumption, waste generation, paper use, fuel consumption, and environmentally preferable products purchasing.

- **Short-term Actions and Priorities**

3.1 Priority and Area Goals

Short term priorities are areas which CDOT plans to focus on within the next 1 – 3 years. (13) Short-term priorities for Property Management include reviewing the research and recommendations in this Plan to determine what can be implemented in an effort to meet the goals of the greening government executive orders. These recommendations should be reviewed by Property Management, in conjunction with the CDOT Greening Government Steering Committee, to determine the following, based on budget, resources, regulatory requirements, and environmental and economic benefits received:

- Which green actions will be implemented
- Additional green actions that can be implemented
- Who in CDOT is responsible for implementing the green actions
- Timeframe for completion of the green actions

When determining which actions in the Plan should be implemented, Property Management and CDOT’s Greening Government Steering Committee should also consider the questions in the following table for each suggested green action. (13) Answers that have a “yes” answer to many or all of the questions should be given highest priorities in both long and short-term goals:

Table 3: Use of questions to determine which green actions should be implemented by Property Management.

Question	Yes	No
Will the action result in environmental / health benefits?		
Are the environmental benefits significant?		
Will the action result in a cost savings over the life of the product / action?		
Are the cost savings significant?		
Will the action support progress in one or more of the Implementation Guide priority areas (energy efficiency, water conservation and quality, waste reduction and recycling, environmental preferable purchasing, transportation)?		
Is the time frame and ease of implementation manageable given agency resources?		
Would this activity help to maintain compliance and meet regulatory requirements?		
Could the action reduce compliance obligations (eliminating a hazardous waste)?		
Is the issue of significant concern to employees, or those who use your services?		
Does the activity have a clear educational value or provide high visibility?		

After short and long-term green actions have been identified for Property Management to implement, the actions should be incorporated into a statewide CDOT Greening Government Implementation Plan that includes green actions to be implemented by multiple CDOT divisions as an agency. After a CDOT Greening Government Implementation Plan is developed for CDOT and approved by the CDOT Greening Government Steering Committee, it must be submitted to the Colorado Greening Government Coordinating Council (Greening Council). CDOT will be responsible for reviewing and updating the

information in the Implementation Plan each year for re-submittal to the Greening Council and will not have to develop a new plan each year unless major changes to the previous year's Plan have occurred. (13)

- **Agency Green Actions**

The following table recommends initial green actions and tasks that can be implemented by Property Management in an effort to reduce Property Management's environmental footprint and meet the goals of the greening government executive orders. The table includes both short-term and long-term actions, depending on the schedule of implementation CDOT determines, which will be based on budget, resources, regulatory requirements, and environmental and economic benefits received.

Table 4: Recommended green actions and tasks to be implemented by Property Management.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
1	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	Identify the green building practices that relate to the activities of Property Management. Summarize LEED-EB and LEED-NC rating systems. Identify which elements and specific credits of the rating systems could potentially be integrated into Property Management's activities.	Many of the elements in LEED, if implemented, will contribute towards meeting the specific goals in the Executive Orders. This task was discussed as part of Phase 2 of this project.	Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government
2	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	Train employees on green building practices that relate to Property Management's activities. Develop a training presentation that includes all the elements in LEED-EB and LEED-NC that relate to Property Management's activities. Ensure that Property Management employees are trained and familiar with applicable green building activities.	Many of the elements in LEED, if implemented, will contribute towards meeting the specific goals in the Executive Orders. This task was discussed as part of Phase 2 of this project.	Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
3	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	Appoint a green building champion within Property Management. Assign this person the responsibility for keeping abreast on green building practices and sharing information with the other members of Property Management.	Since there are so many sources of information regarding green building, it is useful to have one person follow this information.	Property Management	EO D0011 & D0012 07 – Greening of State Government
4	Green building (energy conservation, water conservation, material use)	Incorporate green building practices into Property Management	If a new Glenwood Springs multi-agency building is built, incorporate LEED-NC into the planning, design, and construction.	Based on how the new building will be funded, green building certification may be required. This is a perfect opportunity for an interagency green building effort and should be publicized as such.	Property Management, Public Relations	Senate Bill 07-051 (4/16/07) - Requires any new or renovated building whose total project cost includes 25 percent or more in state funds to be designed and built to a high performance green building standard and certified by a third party.
5	Green building (energy conservation, water conservation,	Be involved in the decision making process	Assign someone the task of participating in the Greening Government Steering Committee.	The information from the Steering Committee feeds to the Greening Council. Since	Property Management	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating,

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
	material use)			buildings have such a large environmental impact, it is important that somebody from Property Management be represented.		maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government
6	Green building (energy conservation, water conservation, material use)	Be involved in the decision making process	Identify how and where green building practices can be incorporated into the Office of the State Architect Policies and Procedures (design/bid/build project basic steps checklist). Share these suggestions at the CDOT Greening Government Steering Committee so they can be communicated to the Greening Council.	The Greening Council has been tasked with developing, implementing, and augmenting programs, plans and policies that relate to greening the government. This is a perfect opportunity to influence state processes.	Property Management, CDOT Greening Government Steering Committee	Executive Order D 005 05 - To the extent practicable, adopt LEED-EB in operating, maintaining, and managing existing buildings and incorporate LEED-NC when designing new construction; EO D0011 & D0012 07 – Greening of State Government
7	Green leasing	Be involved in the decision making process	Identify how and where green leasing practices can be incorporated into new leases of state facilities. Take into consideration energy efficiency, water conservation, recycling, and access to public transportation. Share these suggestions at the CDOT	The Greening Council, working with the Greening Government Manager, has been tasked with developing sustainability standards for new	Property Management, CDOT Greening Government Steering Committee	EO D0012 07 – Resource Management

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Steering Committee so they can be communicated to the Greening Council.	leases of state buildings. The standards will address, at a minimum, energy efficiency, water conservation, recycling, and access to public transportation.		
8	Green building (energy conservation)	Reduce the environmental impact of existing buildings	Contact the Governor's Energy Office to perform a free assessment of the energy consumption in relation to LEED-EB to identify what, if any, improvements would be financially beneficial and worthy of energy performance contracting. This should be done at Camp George West, 4670 Holly, 425 Corporate Circle, and Arapahoe / Centennial. The number to the Governor's Energy Office is 303-866-2201; contact is Seth Porter.	Although these 4 buildings have been brought on within the past 15 months, there is a team of engineers within the Governor's Energy Office who specialize in existing buildings. This is a free service.	Property Management	EO D0011 & D0012 07 – Reduce energy consumption by 20% by 2012.
9	Green building (water conservation)	Reduce the environmental impact of existing buildings	Contact Denver Water to perform a free water audit to determine if water consumption can be reduced. This should be done at Camp George West, 4670 Holly, 425 Corporate Circle, and Arapahoe /	The auditor will determine which fixtures inside the buildings can be fitted with aerators to reduce the flow,	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Centennial. The auditor at Denver Water is Henry Young and he can be reached at 303-525-1451.	and he will provide and install these aerators for free. He will also audit sprinkler systems to determine if the system is working properly and efficiently.		
1 0	Green building (water conservation)	Reduce the environmental impact of existing buildings	Determine if some of the grass at Corporate Circle can be replaced with xeriscaping to reduce water consumption. If this is acceptable by the corporate complex, install xeriscaping in place of some or all of the grass.	Corporate Circle is the building with the highest water consumption of all 4 buildings managed by Property Management.	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% by 2012.
1 1	Green building (water and energy conservation)	Reduce the environmental impact of existing buildings	Encourage green building throughout CDOT. Work with the Regions regarding energy and water conserving initiatives that could be implemented at rest stops (efficient light bulbs, light sensors, vending machine lamps, faucet aerators).	If funds do not go through FHWA for rest stops, then each region is responsible for building / maintaining rest stops.	Property Management, CDOT Regions	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
1 2	Water and Energy Consumption	Compile baseline data for 2005-2006 water and energy consumption	Work with Facilities Management to compile baseline data for 2005-2006 water and energy consumption.	Joe Mahoney in Facilities Management has a good handle on	Property Management, Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			Determine if this information was submitted to the State Architect and DPA for previous years' consumption. Determine how the numbers were compiled and if the numbers were accurate. If the numbers were not accurate, identify and correct any inaccuracies.	consumption at Headquarters. He stated that Johnny Olson could easily pull these numbers together for the maintenance buildings.		consumption by 20% by 2012.
1 3	Water and Energy Consumption	Compile consumption data for 2006-2007 water and energy consumption	Work with Facilities Management to develop a uniform system to make sure water and energy consumption for all CDOT-owned buildings is tracked accurately. Currently, tracking of energy and water consumption is taking place within Property Management and Facilities Management. Make sure these numbers are being combined for accurate consumption reporting for 2006-2007 data.	Joe Mahoney in Facilities Management has a good handle on consumption at Headquarters. He stated that Johnny Olson could easily pull these numbers together for the maintenance buildings.	Property Management, Facilities Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
1 4	Water and Energy Consumption	Set up a system for obtaining more accurate data for future water and energy consumption.	Work with Capital Complex to determine if CDOT's water and energy consumption can be tracked separately from the other agencies that share the Camp George West Campus.	Greg McKlintock at Capital Complex should be able to determine if CDOT's consumption can be tracked separately.	Property Management	EO D0011 & D0012 07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
1	Water and	Set up a system for	Work with utility companies in	Current utility	Property	EO D0011 & D0012

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
5	Energy Consumption	obtaining more accurate data for future water and energy consumption.	various areas where CDOT leases out property to CDOT employees. Determine if energy and water consumption at leased out properties can be separated by property. Determine if this number should be included in the annual consumption data that is reported to the Greening Council.	consumption is not tracked at all CDOT owned properties, because of how the billing is set up.	Management	07 – Reduce water consumption by 10% and reduce energy consumption by 20% by 2012.
1 6	Petroleum Fuel Consumption	Reduce the amount of petroleum consumed in vehicles.	Consider hybrid or flex fuels vehicles for use by Property Management.	The Property Management currently utilizes a Jeep Cherokee, Blazer, Taurus, Intrepid, and Trailblazer as fleet vehicles. Property Management expressed interest in utilizing hybrids.	Property Management, Fleet Vehicles	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.
1 7	Petroleum Fuel Consumption	Reduce the amount of petroleum consumed in vehicles.	Contact Planning to obtain a summary of the Commuter Program in place within CDOT. Notify Property Management employees that this incentive is in place to encourage alternative transportation to work.	At least one employee in Property Management utilizes public transportation to get to and from work, but is not aware of the	Property Management, Planning	EO D0011 & D0012 07 – Cut petroleum use in state vehicles by 25% by June 30, 2012.

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				commuter incentives put in place by the Planning Group.		
18	Paper Consumption	Compile baseline data for 2005-2006 paper consumption.	Determine how much paper was consumed for fiscal year 2005-2006 (both paper without recycled content and paper with more than 30% recycled content).	Property Management uses Inovus as a paper supplier.	Property Management, Business Office	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
19	Materials and Resource Management	Quantify recycling efforts.	Contact Capital Complex or contact Weyerhaeuser to determine how much paper is being recycled by Property Management. Also, determine if additional recycling services are also available under their contract (cans, bottles, cardboard).	Currently, Property Management recycles paper. This service was set up through Capital Complex who manages the Camp George West Campus.	Property Management, Capital Complex	
20	Paper Consumption	Reduce paper consumption	Work with IT to implement the SAP changes so that Property Management does not have to print out a hard copy backup for everything that is managed through SAP.	Once the SAP changes are implemented, Property Management will utilize much less paper.	Property Management, IT	EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
21	Paper Consumption	Reduce paper consumption.	Determine if electronic signatures can replace wet	The Uniform Electronic	Property Management,	EO D0011 & D0012 07 - Reduce paper

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
			signatures. Pose this question to the CDOT Greening Government Steering Committee so it can be communicated to the Greening Council. There may be the potential to influence the upcoming administrative rules regarding use of electronic signatures by state agencies that will be coming from the Secretary of State.	Transaction Act (UETA) allows for use of electronic signatures, and the Secretary of State (SoS) was granted broad rulemaking authority under UETA. The SoS will be adopting administrative rules that apply to all state agencies. More information can be obtained from barbara.groth@os.state.co.us	CDOT Greening Government Steering Committee	consumption by 20% by 2012.
2 2	Environmental Preferable Purchasing	Use more recycled paper	Check to see when the contract for the fax machine expires and determine if one of the state-approved vendors has fax machines that accepts recycled content paper.	All the printers utilized by Property Management accept recycled content paper, but the fax machine does not accept recycled content paper.	Property Management	Act 24-103-207 – State agencies are required that 50% of their paper purchases have at least 30% recycled content; EO D0011 & D0012 07 - Reduce paper consumption by 20% by 2012.
2 3	Environmental Preferable Products	Use environmentally friendly cleaning products	Work with purchasing to specify that contract bids for janitorial services include the requirement to use green cleaning products.	The Property Management Team is getting ready to	Property Management; Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products

	Environmental Topic / Benefit	Green Action	Task	Notes	CDOT Division Responsible	Requirement / Goal
				determine requirements for the 2008 janitorial services contracts.		
2 4	Environmental Preferable Products	Use products with recycled content	Work with purchasing to determine what can be included in bid specifications for the design and build bid process.	If possible, try to include a requirement for recycled materials.	Property Management; Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products
2 5	Environmental Preferable Products	Use local materials	Work with purchasing to determine what can be included in bid specifications for the design and build bid process.	If possible, try to include a requirement for local materials. A discussion with Purchasing identified that CDOT cannot require that local companies respond, but perhaps CDOT can require that a certain percentage of local materials to be incorporated.	Property Management; Purchasing/ Procurement	EO D0011 & D0012 07 - Environmental Preferable Products

- **Management Systems**

4.1 Integrating Environmental Impacts into Key Decision Making Processes

CDOT is in the process of implementing an Environmental Management System (EMS) to manage environmental aspects associated with stormwater runoff from construction activities as well as to protect the quality of water that is permitted under CDOT's Municipal Separate Storm Sewer System (MS4) permit. The EMS sets up a process to integrate environmental impacts into key decision making processes through its management review function. The EMS was developed under the guidance of the American Association of State Highway and Transportation Officials (AASHTO), and information about CDOT's EMS will be uploaded onto the AASHTO website for other transportation departments to utilize when implementing their own management systems.

The EMS is in its early stage of implementation and is still within the first cycle of the Plan-Do-Check-Act continual improvement cycle for EMS implementation. The EMS implementation is currently in the internal audit process and has been implemented up to the "check" portion of the Plan-Do-Check-Act continual improvement cycle. Each year, the Regional Erosion Control Assessment Team (RECAT) performs a minimum of 60 field inspections to determine the extent to which EMS requirements are implemented in the field. The results of these internal audits are then reviewed by the EMS Steering Committee as a management review function of the system. The EMS Steering Committee contains representatives from CDOT Engineering, Maintenance, and Environmental from all 6 CDOT Regions and Headquarters. The Steering Committee meets monthly and then again every 6 months to review the results of the internal audits, to trend the audit findings, to evaluate where additional environmental controls should be implemented, and to identify if any changes need to be made to the EMS based on overall efficiency, adequacy, and effectiveness of the EMS. An external audit of the EMS will be performed by AASHTO sometime in 2008. After the EMS Steering Committee performs a management review of the results of the external audit and makes recommendations for modifications to the EMS, a complete Plan-Do-Check-Act cycle will be completed and future improvements to the EMS can be planned.

After the EMS is successfully implemented for CDOT's MS4 Construction Program permit requirements, CDOT intends to expand the EMS to better manage the environmental impacts associated with all of CDOT's activities and operations.

2. Education and Training of Staff

In order to successfully implement the Plan, CDOT will need to perform training so that all employees are aware of the requirements and goals of the Plan. Many of the recommended green actions, if implemented, will require coordinated efforts by a wide range of employees within CDOT. After the CDOT Greening Government Steering Committee determines which green actions from this Plan will be implemented, training needs will be identified and training will be developed and implemented for those employees who are responsible for the completion of specific tasks. Training will help increase awareness about the goals of the Plan while providing employees with an understanding of how implementing the goals will help reduce the environmental impacts of CDOT's activities.

- **Tracking Progress and Program / Plan Review**

5.1 Agency Tracking and Reporting Form

CDOT does not currently have a tracking system in place to monitor the requirements of the Executive Orders. However, the Colorado Department of Health and Environment (CDPHE) is implementing a database to track the requirements of the Executive Orders. This database is approximately 80% complete and is expected to be 100% complete by the end of the year. In the near future, the Greening Government Manager will be contacting state agencies to obtain tracking information. It is also expected that the Governor's Energy Office will be contracting out consultants to work with state agencies to develop 2005-2006 baseline data that will be reported to the Greening Council.

CDOT research has recommended green actions that include implementing systems to monitor performance indicators for meeting the various Executive Order requirements. These green actions include working with IT to develop better performance indicator tracking systems within SAP. Some examples of performance indicators that relate to each environmental topic discussed in the Guide for state agencies follow:

1. Energy Efficiency
 - Kwh of electricity consumed
 - Therms of natural gas consumed
 - Replacement of energy consuming fixtures
 - Energy savings achieved
2. Water Conservation
 - Gallons of city water consumed
 - Gallons of well water consumed
 - Replacement of water conserving fixtures
 - Water savings achieved
3. Waste Reduction and Recycling
 - Types and quantities in pounds of materials recycled
 - Types and quantities in pounds of waste produced
 - Recycling and waste reduction projects implemented
4. Environmentally Preferable Purchasing
 - Number of contracts incorporating green requirements
 - Amount of paper purchased with 30% recycled product
 - Number of green products purchased
5. Transportation
 - Gallons of gasoline consumed
 - Gallons of diesel consumed
 - Gallons of biodiesel consumed
 - Gallons of E-85 consumed
 - Number of hybrid or flex fuel vehicles in the vehicle fleet
 - Reduction in petroleum products
 - Vehicle miles traveled
 - Vehicle miles not traveled due to alternative transportation

5.2 Continuous Improvement

CDOT plans to achieve continuous improvement through further implementation of its EMS to include additional programs and divisions. Furthermore, the annual tracking to the Greening Council on progress made towards achieving the goals of the Executive Orders will help encourage improvements from year to year. The plan will be updated every year as CDOT makes progress on existing greening government initiatives and identifies new greening government opportunities.

APPENDIX G MEMORANDUM

Date May 15, 2007

MEMORANDUM

TO: Patricia Martinek, CDOT

FROM: Felsburg, Holt & Ullevig

SUBJECT: Technical Memorandum #1: Summary of State of Colorado Greening Government Planning and Implementation Guide and other State Transportation Department Implementations

The purpose of this memorandum is to summarize research that has been completed in an effort to identify environmental opportunities that can potentially be implemented by the Colorado Department of Transportation (CDOT) to reduce environmental impacts from CDOT operations. The specific areas of research summarized in this memorandum and its attachments include the following:

- State of Colorado Greening Government Guide: Recommended action steps for reducing environmental impacts in the following areas:
 - Energy Efficiency
 - Water Conservation and Quality
 - Waste Reduction and Recycling
 - Environmentally Preferable Purchasing
 - Transportation
- AASHTO Center for Environmental Excellence Case Studies: Summary of other State transportation department implementations in the following areas:
 - Energy Efficiency
 - Water Conservation and Quality
 - Waste Reduction and Recycling
 - Environmentally Preferable Purchasing
 - Transportation

SELECTION OF RESEARCH

State of Colorado Greening Government Planning and Implementation Guide

The *State of Colorado Greening Government Guide* is a focal point of research due to its relevance to the Executive Order signed by Governor Bill Ritter to green the State Government. The planning and implementation guide is divided into three sections:

- *Section 1: Introduction and Background;*

- *Section 2: Greening Government Area Guidance; and,*
- *Section 3: Agency Greening Government Planning*

Section 1: Introduction and Background provides information on environmental issues of concern, sustainability principles, and the rationale for establishing a state green government program. Information from Section 1 will be included in a Power Point Presentation prepared by FHU and given to CDOT to demonstrate to upper Management that environmental issues affect the quality of life in our communities and around the country.

Section 2: Greening Government Area Guidance focuses on five topics that impact the environment. The guidance suggests specific strategies and action steps that agencies should take, where appropriate, to achieve environmental improvements. Table 1 lists the five topics included in Section 2 of the ***State of Colorado Greening Government Planning and Implementation Guide*** and relates those topics to the specific requirements of the Executive Order.

Table 1

Environmental Topics from Section 2 of the Greening Government Planning and Implementation Guide and how those topics align with the requirement from the Executive Order

Environmental Topics	Executive Order Requirement to be achieved by 2012
Energy Efficiency	Reduce energy consumption by 20%
Water Conservation and Quality	Reduce water consumption by 10%
Waste Reduction and Recycling	Cut use of paper products by 20%; adopt a goal of zero waste
Environmentally Preferable Purchasing	Purchase more environmentally friendly products
Transportation	Cut use of petroleum products in state vehicles by 25%

Section 3: Agency Greening Government Planning provides a step-by-step guide to help agencies initiate and manage greening government plans and implement internal greening government programs. This section also includes a template for a Greening Government Plan. FHU will follow the template to develop Implementation Plans for the CDOT operations that FHU assesses for greening opportunities..

AASHTO Center for Environmental Excellence Case Studies

The American Association of State Highway Transportation Officials (AASHTO) Center for Environmental Excellence website has posted case studies from nine State transportation departments to demonstrate some specific elements of Environmental Management Systems (EMSs) that have been implemented within the DOTs. The case studies were selected as a focal point of research because they summarize the efforts implemented by other DOTs. Specifically, this summary focuses on actions that relate to energy efficiency, water conservation and quality, waste reduction and recycling, environmentally preferable purchasing, and transportation that have been implemented by the following State transportation departments and reported on the AASHTO website:

1. Texas Department of Transportation (TxDOT);
2. Florida Department of Transportation (FDOT);
3. Maryland State Highway Administration (MDSHA);

4. Washington Department of Transportation (WSDOT);
5. New York State Department of Transportation (NYSDOT);
6. Maine Department of Transportation (MDOT);
7. New Hampshire Department of Transportation (NHDOT);
8. Massachusetts Highway Department (Mass Highway); and,
9. Pennsylvania Department of Transportation (PENNDOT)

SUMMARY OF RESEARCH

State of Colorado Greening Government Planning and Implementation Guide

Appendix A summarizes recommended actions that state agencies can implement in order to reduce environmental impacts in five focused areas. For each area of focus, a detailed description of each recommended action step, its impact on resource management, and notes on each action step are summarized in Appendix A. Table 2 lists the specific focus areas and the number of recommended action steps that relate to each environmental topic. An action step is an action that can be implemented in an effort to lesson a specific environmental impact. Some action steps recommended within the State of Colorado Greening Government Planning Guide include easily implemented, low cost actions such as researching current practices in place, establishing baseline information on consumption, establishing greener behaviors, developing and implementing training to ensure the success of those greener behaviors, and communicating successes to employees. Other action steps recommended within the Planning guide include higher cost items such as phasing out high water use fixtures, installing energy star windows and appliances, purchasing cleaner burning vehicles and hybrid vehicles, and adopting the Leadership in Energy and Environmental Design (LEED) rating system in operating, maintaining and managing existing buildings.

Table 2
Environmental Topics and the Number of Recommended Action Steps that Relate to each Topic from Section 2 of the Greening Government Planning and Implementation Guide

Environmental Topics	Number of Recommended Action Steps for each Topic
Energy Efficiency	17
Water Conservation and Quality	28
Waste Reduction and Recycling	18
Environmentally Preferable Purchasing	13
Transportation	11

AASHTO Center for Environmental Excellence Case Studies

Appendix B summarizes the actions State transportation departments have implemented that relate to the environmental topics of focus in the *State of Colorado Greening Government Planning and Implementation Guide*. The information used to prepare the summary was obtained from the AASHTO Center for Environmental Excellence website. The summary includes the program focus for each transportation department, and what actions have been taken in each environmental focus topic area. Table 3 summarizes whether or not action has been taken in the specific focus area for each transportation department. This information was taken

from case studies on the AASHTO Center for Environmental Excellence website. An X in the table indicates that action has taken place or action is being planned. Although CDOT was not represented by a case study on the AASHTO Center for Environmental Excellence website, a row was added to the bottom of the summary table to compare CDOT activities with those of other state transportation departments.

Table 3

Summary of Whether Action was taken by State Transportation Departments in the Environmental Topic Areas from Section 2 of the Greening Government Planning and Implementation Guide

State Agency	Energy Efficiency	Water Conservation and Quality	Waste Reduction and Recycling	Environmentally Preferable Purchasing	Transportation
TxDOT	none	X	X	none	none
FDOT	none	none	X	none	none
MDSHA	none	X	X	none	none
WSDOT	none	X	X	none	none
NYSDOT	X	X	X	X	X
MDOT	none	X	none	none	none
NHDOT	none	X	X	none	none
Mass Highway	none	X	X	none	none
PENNDOT	none	X	X	none	none
CDOT*	X	X	X	none	X

* CDOT was not represented through a case study on the AASHTO Center for Environmental Excellence website. Information was obtained directly from CDOT.

CONCLUSION

State of Colorado Greening Government Planning and Implementation Guide

The action steps relating to water, waste, environmentally preferable purchasing, and transportation that are recommended in the State of Colorado Greening Government Planning and Implementation Guide will be evaluated to determine their applicability to CDOT. A small amount of focus will also be placed on those action plans relating to energy.

The evaluation process for each action step will require additional research in the form of employee interviews, employee behavioral observations, and review of records. This additional research will help determine the applicability of each action step and the degree of control CDOT has to implement these action steps. In order to evaluate the applicability of each action step, FHU has arranged for interviews with employees from the following CDOT departments:

- Fleet Vehicles
- Property Management Division
- IT
- Print Shop
- Procurement / Purchasing

- Planning
- Facilities Management

Once the interviews are completed, FHU will incorporate the results into a new column in Appendix A that will be distributed to upper Management during the Power Point Presentation.

AASHTO Center for Environmental Excellence Case Studies

The nine State transportation departments represented as case studies on the AASHTO Center for Environmental Excellence website focused their efforts on an EMS approach to address either specific problems they were having as an agency or requirements that were placed on them through administrative consent decrees or Executive Orders. No State transportation agencies represented on the AASHTO website have reported actions implemented towards energy conservation in buildings, though NYSDOT promotes the use of alternatively fueled vehicles and employee behavior to minimize transportation needs. In some cases, actions have been implemented by the other State transportation departments that relate to water conservation and quality, waste reduction and recycling, environmentally preferable purchasing, and transportation that could potentially be implemented to reduce CDOT's environmental impacts and to help CDOT address the Greening the Government Executive Orders.

In regards to water conservation and quality, all State transportation departments, with the exception of FDOT which focused on NEPA Planning, incorporated an aspect of stormwater management into their EMS efforts and approach. Likewise, CDOT has incorporated an EMS approach into managing their activities and associated environmental impacts on the quality of stormwater. Regarding water conservation efforts, Mass Highway has implemented upgrades including installation of wash water recycling systems.

In regards to waste reduction and recycling, four of the State transportation departments have implemented environmental databases to help manage, track, and monitor aspects of their operations. By utilizing electronic technology to share information, these agencies have reduced paper waste while minimizing the time required to retrieve information and maximizing efficiency of tracking projects and tasks. WSDOT has started measuring recyclables and their use of recycled materials. NHDOT has reduced their waste disposal costs by \$25,000 by recycling solids from a water and paint waste mixture into plastics, rather than disposing of this mixture as waste. NHDOT has also reduced the cost of purchasing aluminum traffic signs by 40%. Rather than purchasing new signs, NHDOT utilizes a contractor to hydrostrip sheet metal from worn signs so the sign blanks can be reused. To address waste reduction and recycling, CDOT has implemented a mixed stream recycling program at Headquarters.

In terms of environmentally preferable purchasing, the AASHTO case studies did not mention efforts made towards environmentally preferable products, with the exception of NYSDOT's environmental initiative statement to reduce herbicide applications.

Research has shown that some actions have been implemented by the other State transportation departments that relate to the requirements in Colorado's Greening the Government Executive Orders and could potentially be implemented within CDOT to reduce CDOT's environmental

impacts. Further research as part of Phase II of this project could uncover additional actions that are specific to requirements in the Colorado Executive Orders that have been implemented by those State transportation departments not represented on AASHTO's website.

From State of Colorado Greening Government Planning and Implementation Guide

ENVIRONMENTAL IMPACT	ACTION STEP	Impact on Resource Management	NOTES
Energy Efficiency			
1	Contact OEMC to get technical assistance in identifying and implementing cost-effective approaches, and utilizing innovative financing approaches with available utility rebates to pay for the projects.		Spoke with Seth on 4/30/07 and he explained that the Governor's Energy Office offers free assessment engineers to come in and determine if it would be worth it to hire out a performance contractor. The audits that the performance contractors perform will cost money based on the savings realized. Savings will go to replace the equipment and pay the performance contractors.
2	Use performance contracting to initiate and implement large-scale, comprehensive energy-saving projects.		
3	Adopt the LEED-EB rating system in operating, maintaining and managing existing buildings, as applicable.		
4	Incorporate LEED-NC practices to design energy and resource efficient buildings, to the extent that is cost-effective.		
5	Require commissioning to ensure new construction projects function as designed.		Is this performed by the performance contractors?
6	Initiate an energy management program to monitor and manage utility usage and costs.	N/A - will monitor consumption	
7	Collect gas and electricity data to create a baseline.	N/A - will supply baseline data	This will be done at HQ site visit.
8	Turn off lights in offices, conference rooms, kitchens, etc.		Behavior will be observed at HQ site visit.
9	Install motion detectors in rooms that are not used regularly.		
10	Replace incandescent exit signs with LED exit signs.	Can save 20 - 30 watts	energystar.gov has calculators that show savings on exit signs, printers, scanners, water coolers, etc.
11	Replace incandescent lamp bulbs with compact fluorescent lamps (CFL)	Replacing a 100 watt with a 27-watt CFL saves more than \$60 over the life of the bulb. They also last up to 10 times longer.	
12	Install motion sensing vending mixers on soda machines.	Will save 40% in energy costs.	
13	De-lamp the soda machine	Save an additional 20% (60% total energy savings in cost)	
14	Use the sleep setting on the computer to go to sleep if it is not being used for over 20 minutes.	Monitors typically use 1/2 the electricity of the entire computer system.	
15	Replace your old CRT monitor with a new LCD monitor.	LCDs use 25% the energy, last longer, and contain less toxic content.	Perform a CIB Analysis? Include cost of disposal/recycling.
16	Operate equipment only as needed. Perform night and weekend audits to determine what equipment is operating and not needed (bathroom lights, desk lights, fans, printers, etc.)		
17	Replace windows with energy star windows		Inventory types and # of windows at HQ visit.
ENVIRONMENTAL IMPACT	ACTION STEP	Impact on Resource Management	NOTES
Water Conservation and Quality			
1	Install motion sensors for restroom hand sinks.		implemented by State laboratory
2	Convert landscaping from Kentucky bluegrass to native plants and ground cover such as Blue Grama grass and woodchips		implemented by State laboratory
3	Install flow restrictors on all toilets to reduce the amount of water used during each flush		implemented by CDPHE
4	Use existing data (water and sewer bills) to prepare a summary of the volume and cost of water being consumed.		
5	Look for trends in water consumption and unexplained increases that could indicate leaks or insufficient use of water.		
6	Replace toilets that use 3.5 to 5 gallons per flush with 1.6 gpf units.		
7	Replace urinals that exceed 1.0 gallon per flush. Consider using waterless urinals.		
8	Install low flow faucet aerators - 1.0 gallon per minute		
9	Install low flow shower heads - 2.5 gallons per minute		
10	Check system pressure and install pressure-reducing valves to reduce water consumption.		
11	Phase out high water use landscapes at state-run facilities. Change over to xeriscape plants such as Blue Grama Grass and Fine Fescues. Great online resource is http://www.ext.colostate.edu/men/water.htm		Visit http://www.ext.colostate.edu/men/water.htm
12	Plant drought tolerant native plants and grasses in existing landscapes to reduce irrigation needs.		
13	Minimize the amount of fertilizer used at state-run facilities.	Reduces the amount of excess fertilizer runoff that impacts the quality of state waters.	
14	Consider hand-pulling of weeds, especially before seeds are produced. This will keep chemical pesticides out of storm water.		
15	Limit lawn watering to hours when evaporation is lowest - early in the morning or later in the evening to maximize absorption and minimize evaporation.		
16	Be a creek steward. Adopt a stretch of creek and commit to cleaning up debris at least 2 times a year.		
17	Don't wash lawn clippings or leaves down storm drains. It can clog sewers and add excess organic matter to local water resources.		
18	Stencil around storm drains so people are aware that the water that enters these drains goes directly to waterways without being treated.		
19	Implement a water conservation awareness and outreach program. Solicit employee ideas through surveys or suggestion boxes.		
20	Place stickers in restrooms encouraging water conservation.		
21	Implement water conservation and water quality training modules available at www.co.train.org		
22	Visit websites to help identify, assess, and implement water conservation and water quality opportunities - www.ourwater.org and www.greenco.org		
23	Highlight water conservation measures for employees and general public		
24	Conduct a water audit to identify measures where the greatest efficiencies and potential savings can be realized. Denver Water will audit customers for free.		
25	Estimate cost and water savings for potential conservation measures, to prioritize projects' cost effectiveness.		
26	Reduce non-essential water uses, especially during periods of drought. Non-essentials include vehicle washing, decorative fountains that do not recirculate water, etc.		
27	Routinely inspect and repair any leaking water lines as well as pumps, valves and faucets		
28	Eliminate one through cooling systems.		

From State of Colorado Greening Government Planning and Implementation Guide

ENVIRONMENTAL IMPACT	ACTION STEP	Impact on Resource Management	NOTES
Waste Reduction and Recycling			
1	Conduct a waste assessment to identify the types and amounts of wastes generated at your facility.		www.epa.gov/wastewise/
2	Use this assessment to establish a baseline for the amount of waste you generate, including volume and cost of waste management.		
3	Determine if there are items that go the landfill that can easily be recycled.		CDPHE currently recycles glass, aluminum, plastic #1, plastic #2, newspaper, magazines, office paper, phonebooks, cardboard, paperboard, junk mail, batteries, and cell phones.
4	Establish waste reduction/recycling goals.		
5	Make information available to employees on how they can reduce and recycle waste generated in their homes and away from the office.		
6	Establish and promote a double-sided printing policy to ensure that internal and external documents are printed 2-sided.		
7	Require RFP bid submissions to be double-sided and ask for them without extraneous materials.		
8	Work with the Department of Personnel and Administration (DPA) to obtain information about recycling / solid waste contracts that may be assessed to assist and improve agency waste reduction programs.		
9	Ensure that reporting requirements for any vendors that perform recycling/solid waste activities are included in their contracts. This will help with tracking and reporting information needed to show progress towards meeting goals.		
10	Establish designated office supply reuse centers or areas in offices to allow for unused or reusable supplies to be available, such as binders, file folders, staplers, paper clips, pens, notepads, boxes, and other supplies.		
11	Initiate a paper reduction campaign. 1) measure paper purchases / use and set a goal for reduction.		
12	Utilize the web and other electronic media for distribution of documents and miscellaneous materials.		
13	Distribute information on how to reduce the amount of junk mail received within the agency and at home. Visit http://www.dmaconsumers.org to remove your name from junk mailing list.		Greendimes.org is another source
14	Review policy for the replacement of computers and monitors. Replace less often / replace with LCD.		
15	Focus your recycling on the most commonly generated materials.		
16	Obtain recycling bins appropriate to what you are recycling. Place them near the trash bins so it is easy for employees to recycle.		
17	Place large, clear signs in appropriate locations throughout the facility to increase employee awareness of your recycling program.		
18	Publicize your recycling data so employees know how they are doing in achieving goals. Challenge employees to continually improve every year.		
ENVIRONMENTAL IMPACT			
Environmentally Preferable Purchasing (EPP)			
1	Ensure that 50% of paper purchases have at least 30% recycled paper content, as required by state agencies per Act 24-103-207		
2	Designate a person to stay abreast of EPP uses, receive ongoing information such as the EPP newsletter, circulate appropriate information to appropriate agency personnel. Work with the DPA to stay on top of EPP information and news.		
3	Track and report EPP purchases / activities		
4	Work with the DPA to develop language for use in contracts to incorporate EPP specifications into service contracts and grants.		
5	Purchase EPP whenever they are equal in performance and cost-effective based on life-cycle include purchase, operation, and disposal costs.		
6	Purchase and evaluate new EPP periodically and/or participate in EPP testing opportunities.		
7	Identify the most significant purchases made on an annual basis and take steps to ensure that the products contain EPP criteria whenever possible and effective.		
8	Participate in EPP conferences, training, workshops, and appropriate awards and recognition programs/		
9	Purchase EPP products that cost less, including: remanufactured toner cartridges, remanufactured office panels, retread tires, recycled mulch, recycled antitheeze, recycled plastic traffic cones, recycled traffic signs.		
10	Purchase durable products that do not have to be replaced often, such as plastic lumber furniture, decking, planters, and other recycled plastic outdoor products. Reduced maintenance and replacement costs can offset additional purchasing costs.		
11	Purchase less or non-toxic products such as: bio-based lubricants especially for landscaping equipment near sensitive areas; mercury free thermometers, lights, green cleaning chemicals, use carpet and paints with low volatile organic compounds (VOCs).		
12	Ask all bidders to submit proposals on recycled paper, double-sided copies, and without extra material.		
13	Use bulk purchasing of EPPs to reduce product costs.		
ENVIRONMENTAL IMPACT			
Transportation			
1	Purchase cleaner burning vehicles, EPA Tier II, Bin 5 or better - hybrid vehicles, Jeep Liberty diesel, vehicles that run on biodiesel blend (B-20)...		
2	Set a goal to reduce the number of SUVs in the fleet (sedans have up to 50% better fuel economy).		
3	Tighten the justification requirements of those who want to order SUVs for their agencies.		
4	Educate employees on combining trips to reduce miles driven.		
5	Educate employees on driving conservatively, checking tire pressure monthly, and keeping up to date on regular maintenance of vehicles. Create a checklist to help track the maintenance.		
6	Reduce meetings away from the office and encourage the use of conference calls.		
7	Perform an inventory on your fleet and conduct a needs assessment (Do you need as many SUVs as in the fleet, or can you get there with a sedan?)		
8	Set up a telecommuting program at your agency for employees that have jobs that will allow them to work from home.		
9	Look into implementing flexible work schedules.		
10	Have flex-fuel vehicles use E-85 when practical. Provide a map in each vehicles that shows E-85 stations. Include a log sheet in the vehicle that shows when E-85 is used in the vehicle.		
11	Provide preferred parking to individuals who drive hybrids or who carpool to work.		

From AASHTO Center for Environmental Excellence Summary of Case Studies at other State DOTs where EMS elements have been implemented

State DOT	Program Focus	Energy Efficiency	Water Conservation and Quality	Waste Reduction and Recycling	Environmentally Preferable Purchasing	Transportation
Texas (TXDOT)	Three main areas focusing on regulatory compliance: 1) Project Planning and Development; 2) Construction Operations; 3) Facility Operations.	N/A	Water Quality - A Stormwater Advisory Team (SWAT) has been organized to ensure compliance with stormwater regs, convey information, provide training, assist in development of a SWPPP packet for use across TXDOT. SWAT is a multi-disciplinary team bringing in a wide variety of input into the process. Also, District Environmental Quality Coordinators (DECQs) help determine compliance with stormwater requirements.	Environmental Tracking System (ETS) to track projects throughout the planning stages. This near paperless environment reduces waste (less paper) and also minimizes time needed to retrieve files/information, while helping to meet the goals of program focus area #1.	N/A	N/A
Florida (FDOT)	Planning and Project Development	N/A	N/A	FDOT maximizes the use of electronic technology to minimize burdensome paper trails.	N/A	N/A
Maryland State Highway Administration (MDSHA)	Stormwater Management Program addresses construction and operations. The enterprise-wide Environmental Strategic Plan will address Planning and Design. The Independent Environmental Monitoring Program addresses construction.	N/A	Stormwater Management program for NPDES compliance; established partnerships with local jurisdictions involving watershed assessments. Received one of the first Municipal Separate Storm Sewer System (MS4) permit issued to a state transportation agency. Reduced stream impacts through Environmental Monitor, a cooperative effort between MDSHA and the Corps - obtain water quality data.	Utilizes an enterprise-wide oracle database called Permit Tracker with a visual basic software front end.	N/A	N/A
Washington (WSDOT)	Initial efforts concentrated on compliance and demonstrating compliance: 1) Construction 2) Parts of maintenance and operations 3) State Ferry System	N/A	Current water quality programs being integrated into EMS efforts (erosion control program, wetland mitigation evaluation effort)	EMS will measure recyclables and the use thereof.	N/A	N/A
New York State (NYSDOT)	Planning, Design, Construction, and Operations and Maintenance	see transportation	Environmental Initiative Statement states that NYSDOT will improve water quality by constructing stormwater control measures to better control the non-point source discharges.	Utilizes ETRACK database, a Microsoft Application which tracks projects and their major milestones - ensures consistency in reporting and tracking statewide environmental information. Environmental Initiative Statement states that NYSDOT will pilot and promote the use of tires in highway embankments; glass, plastics, and aggregates in pavement mixes; and plastic, rubber, and aggregate in noise walls.	Environmental Initiative Statement states that NYSDOT will reduce herbicide applications.	Environmental Initiative Statements states that NYSDOT will promote the use of alternative fueled vehicles, encourage alternatives to single-occupancy vehicle commuting, support mass transit, and provide facilities for pedestrians and bicyclists.
Maine DOT	Maintenance and Operations (focused on compliance in managing waste streams at maintenance facilities - including highway, traffic, rest areas, moveable bridges), State Ferry Service, Materials testing facilities	N/A	BMPs for Erosion and Sediment control, April 1999	N/A	N/A	N/A
New Hampshire (NH DOT)	Pavement marking and sign fabrication operations (developed as part of a consent decree addressed at managing hazardous waste)	N/A	Water Quality - EMS procedures, processes, tools have been used to address NPDES Phase II compliance.	Ex. #1: Washwater from water based pavement marking paints - Remove waste paint from water and recycle the solids from paint waste into plastics. The water is discharged into the municipal sewer system - It saves \$25K per year in disposal costs. Ex. #2: Sheeting metals are hydrostripped from worn aluminum traffic signs by a contractor. The sign blanks are returned and reused - they are 40% less costly than new signs.	N/A	N/A
Massachusetts Highway Dept (Mass Highway)	Compliance - Operation and Maintenance activities at depot facilities (in response to an Administrative Consent Order)	N/A	Water quality EMS efforts included septic system upgrades/installation, sewer connections, floor drain upgrades, and installation of wash water recycling systems	Initial funding efforts of EMS went to "cleaning up" previously accumulated wastes	N/A	N/A
Pennsylvania (PENNDOT)	Maintenance Units. In particular: 1) Stockpile and garage operations; 2) Erosion and Sedimentation control during roadway maintenance; 3) Winter services. EMS was a result of a State-level EO to green the government.	N/A	Erosion and sedimentation control during roadway maintenance activities	Materials usage control practices helped extend the life of road salt by 3 weeks.	N/A	N/A
Colorado Department of Transportation (CDOT)	CDOT was not represented by a case study on the AASHTO Center for Environmental Excellence website. This row was added to compare CDOT activities with those of other state transportation departments.	CDOT in in the processing of obtaining a performance contractor to perform an energy assessment and determine energy savings.	CDOT has developed an EMS for managing the impact of its operations on the quality of stormwater.	CDOT has implemented a mixed stream recycling program.	N/A	CDOT has started using biodiesel in Region IV and CDOT's fleet includes some hybrids 85 and E- vehicles.

APPENDIX H PROPOSAL

Greening Government Implementation Plan Research and Alternative Energy Lighting

FHU Team

The Felsburg Holt & Ullevig (FHU) Team is comprised of individuals familiar with CDOT operations, sustainability practices and management evaluation systems.

The Project Manager is Carrie Powers who has experience working with CDOT engineers, planners and environmental professionals. Carrie is providing consulting and technical support to the CDOT Environmental Management System Subcommittee under Rick Willard. Carrie has previous program and project management experience in the area of water quality.

The QA/Technical Reviewer will be Art Hirsch who has over 10 years of experience working with CDOT. Art Hirsch provides a CDOT perspective on operations and operating procedures.

Deborah Ferraro (A Creative Environment) is a FHU Team member. Deborah is an expert in using Environmental Management System (EMS) approaches that will be used in this project. She is well versed in regulatory compliance and sustainability. Deborah has given numerous presentations on EMS strategies in solving compliance problems.

Project Goals

FHU understands that the driving force behind this project is Governor Ritter's Executive Order, Greening of State Government: Leading by Example (the Order). The key to this Order is for state agencies to reduce their consumption of energy and resources that will have less of an overall environmental impact on Colorado. CDOT will need to address some critical environmental actions such as:

- Reduce gas consumption on fleet vehicles/vehicle purchasing
- Pollution Prevention
- Material recycling and reuse
- Water conservation
- Preferred purchasing of environmentally friendly products
- Employee transportation
- Facility management
- Construction
- Land use

The objective behind this project is to initiate the development of a long-term strategy on how to address the Order's requirements. The identified strategy will be used to develop an implementation plan that will address modifications to existing CDOT operations and processes. Understanding and modifying established CDOT processes

and procedures will be the heart of the project. The identification and use of a management evaluation tool is an essential to the project. FHU will leverage off activities performed by other state DOTs in an effort to reduce energy and material resources.

Scope of Work

To reach these Project Goals, FHU has identified the following tasks

Task 1 Survey Review/Results Assessment

CDOT Greening Government Employee Survey- CDOT will be developing an employee survey that will help in identifying CDOT energy and resource reduction actions that are already being performed by CDOT and what types of further actions can be done to reduce energy and resource consumption. The results of the survey will be collected and compiled by CDPHE.

The FHU Team will review and provide feedback to the CDOT Project Manager regarding the survey form questions. FHU will work with CDPHE to obtain the survey results and will review and evaluate the survey results. This survey information will be assessed along with the literature search materials in Task 2.

Task 2 Information Review/Research

The Order will affect numerous CDOT operations, processes and operating procedures. To modify these CDOT elements, it will be important to understand these CDOT procedures, and to determine what other state agencies and DOTs are doing to reduce energy and resource consumption.

FHU will perform a literature search on state agency Greening initiatives (especially in Colorado); DOT Greening, the AASHTO Center for Environmental Excellence and other reference literature. The FHU Team anticipates using the AASHTO EMS model for management evaluations; additional details on how other states utilized this EMS for energy/resource reduction will be sought and reviewed.

FHU will need to obtain and review specific CDOT documentation on processes and operating procedures to help identify candidate operations for energy/resource reduction. To understand selected operations, FHU will need to visit headquarters and/or regional operations to assess opportunities for energy consumption and resource management.

Deliverable: Technical Memorandum that summarizes agency and CDOT research and the identification and conceptual utilization of a management evaluation system.

Task 3 Implementation Plan Outline/EMS Management Approach

Based upon the information assessed from the literature search and on site visits, 2-3 candidate CDOT operations and processes will be selected for management system evaluation and implementation plan development. FHU will work closely with the CDOT Project Manager in the selection of these candidates.

Deliverable: Technical Memorandum identifying the 2-3 CDOT operation and processes for management assessment.

FHU will develop an initial implementation plan for the top 2-3 candidate operations that have the best potential for success. The environmental management evaluation process will be conducted for future implementation. The plan will clearly demonstrate how the “greening” concept can benefit CDOT.

It is envisioned that the implementation plan will contain the following elements: 1) reduction goals and objectives, 2) candidate CDOT operations and selection criteria, 3) management evaluation methodology and results, 4) coordination with CDOT personnel, 4) potential timeline 5) metrics demonstrating success, 6) evaluation approach.

Deliverable: Develop a Draft and Final Greening Government Implementation Plan for the top 2-3 operation/process candidates.

Task 4 Summary Deliverables

FHU will develop a summary project document report for CDOT management and staff. The report will summarize the activities performed on the project, the results, lessons learned, and future recommendations for implementation.

A power point presentation will be developed for the CDOT Project Manager, management, and staff.

Deliverable: Draft and Final Report that summarizes the Project activities, accomplishments and recommendations. (1) Power Point presentation will be give to CDOT management and staff

Task 5 Project Management

FHU's Project Management tasks will include: 1) initial project kick off meeting 2) client meetings and 3) team meetings. Invoices will contain a brief description of activities performed for that billing month.

Schedule

The project will begin on the day the notice to proceed is given to the FHU (April 2, 2007 target date); all work must be performed by June 30, 2007.

Cost Estimate

The project limit is \$30,000. FHU has provided a spreadsheet of the financial cost estimate that coincides with the above-mentioned scope of work. Cost estimates include tasks, employee classification, labor rates, task totals and other direct costs.