

Colorado Energy Smart Transportation – Initiative Summary

Mission and Goals

The mission of the Energy Smart Transportation initiative was to develop a framework for considering energy efficiency and greenhouse gas emissions in transportation decision-making. Improving the energy efficiency and reducing associated greenhouse gas (GHG) emissions impacts of Colorado's transportation sector will:

- Retain more dollars and jobs in the Colorado economy;
- Address air quality issues, such as ozone and GHG emissions;
- Improve the environment and the health of Coloradans;
- Demonstrate that Colorado is a national leader in transportation innovation; and
- Overall, enhance the quality of life for Colorado's citizens.

Energy Smart Transportation Initiative Approach

Beginning in May 2011, a Collaborative Team of federal and state agencies, Metropolitan Planning Organizations (MPOs), and rural planning partners came together to leverage resources, and promote efficiency and effectiveness among agencies by collectively exploring ways to develop "energy smart transportation" strategies.

Several work groups were formed to develop:

- Approaches to incorporating the consideration of energy efficiency and GHG emissions in transportation planning;
- Strategies to increase energy efficiency and reduce GHG emissions from transportation; and
- Methods to measure and analyze the GHG impact of potential strategies.

A brief summary of the results follows.

Incorporating Energy Efficiency and GHG Emissions in Transportation Planning

Energy can be considered at various points in the transportation planning process to make "energy smart" transportation decisions. A work group on planning considered several possibilities, including:

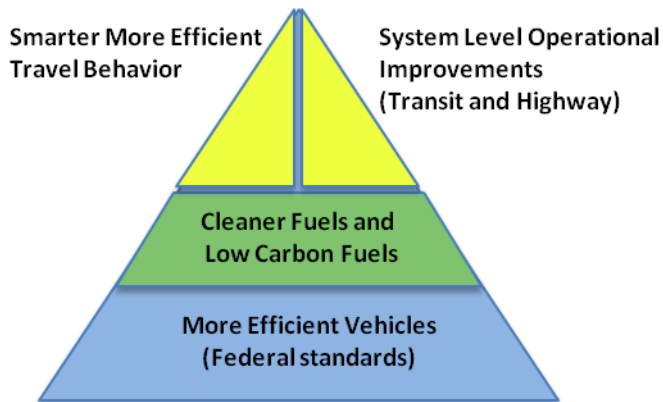
- **Policies** - Adopt a new high-level policy to consider energy in transportation infrastructure planning and spending across all aspects of the CDOT's work (planning, purchasing, facilities, design, and construction).
- **Long-Range Transportation Planning** - Incorporate consideration of energy efficiency and GHG emissions into the guidance, development, and public outreach for the 2040 Statewide Transportation Plan. Integrate energy efficiency into corridor visions, modal transportation plans, and scenario planning.
- **STIP and TIP Development** - Encourage the planning regions and CDOT to use GHG emissions and energy as a secondary evaluation criterion for project selection and provide tools to measure impacts and make decisions.
- **Project Development** - Incorporate energy considerations into the CDOT Design Manual and construction specifications.

Participants in the Collaborative

- Colorado Department of Public Health and Environment (CDPHE)
- Colorado Department of Transportation (CDOT)
- Denver Regional Council of Governments (DRCOG)
- Department of Local Affairs (DOLA)
- Environmental Protection Agency (EPA)
- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA)
- Governor's Energy Office (GEO)
- Governor's Office of Policy and Initiatives
- Grand Valley MPO
- North Front Range MPO
- Pikes Peak Area Council of Governments (PPACG)
- Pueblo Area Council of Governments (PACOG)
- Regional Air Quality Council (RAQC)
- Regional Transportation District (RTD)
- Statewide Transportation Advisory Committee (STAC)
- U. S. Department of Housing and Urban Development (HUD)



Strategies to Increase Energy Efficiency and Reduce GHG Emissions from Transportation



As noted in the pyramid graphic, federal standards will increase the efficiency of the vehicles on our nation's roadways over time. However, the state has numerous ways to enhance the number of efficient vehicles and to encourage energy efficiency in the transportation sector. The Advanced Technology Vehicles/Alternate Fuels Work Group considered almost 20 strategies to increase the use of alternative fuels such as compressed natural gas (CNG), biofuels and electricity and enhance the deployment of advanced vehicles such as conventional hybrids, plug-in hybrids, pure electric, and CNG vehicles. Encouraging more efficient travel behavior and system operation also leads to additional energy savings. The

Smart Systems/Trips Work Group reviewed almost 60 potential strategies to provide better transportation services by improving the efficiency of the system, improving travel times, reducing congestion, or providing citizens with more travel choices in real-time while promoting energy efficiency.

Each group prioritized a short list of strategies, based on ease/feasibility of implementation and energy reduction potential. These strategies were then analyzed for their GHG reduction potential. While a smaller group of strategies was selected for analysis, there are other strategies that could and may be enacted in the coming years.

Near-Term Priority Strategies for Advanced Technology Vehicles/Alternative Fuels:

1. **Promote public/private partnerships and shared station agreements to support NGV use in fleet vehicles** – This strategy would identify opportunities to establish public-private partnerships among government and private fleets and the natural gas industry to create additional liquefied natural gas (LNG) and compressed natural gas (CNG) fueling stations.
2. **Truck Stop Electrification Pilot Program** – This pilot program would identify a CDOT rest area to test the feasibility of truck stop electrification. Currently, long-term idling is prevalent at rest areas in order to provide comforts such as: heat, air conditioning, and entertainment options to the sleeper cab during daily, mandatory 6 - 8-hour rest breaks. Truck stop electrification provides an alternate power source to the truck cab. A CDOT work group has been formed to consider potential test sites.
3. **Consolidate alternative fuel/advanced vehicle procurement for public fleets** – This strategy would aggregate the demand for alternative fuel and advanced technology vehicles for all public fleets through a single bid process to improve vehicle availability and reduce costs through economies of scale.
4. **Sustainability in Design and Construction** – This strategy would identify opportunities to encourage sustainable construction practices for CDOT projects. CDOT is anticipating contracting with a consultant to develop a comprehensive list of design and construction activities, define an evaluation process, and recommend performance goals for sustainable construction evaluations.
5. **Energy Literacy Program** – This strategy combines a number of concepts to increase awareness of transportation energy use, its impacts, and ways to reduce transportation energy use. This effort is anticipated to complement other strategies and produce additional energy reduction benefits. GEO and CDOT are currently working together to develop this program.
6. **Investigate long-term policy options to address the impact of decreased infrastructure revenues from increased penetration of alternative fuels and fuel efficient vehicles** – A CDOT effort could include determining the impact of alternative fuel vehicles and high efficiency vehicles on the state's ability to continue to support infrastructure maintenance and construction.

Near Term Priority Strategies for Smart Systems/Trips

1. **Enhance real-time traveler information (Smart Phone Application)** – Develop a smart phone application that provides travelers with real-time traveler information such as: estimated trip time, road closures and traffic conditions, and best time of day to travel on a given route. This strategy is currently in the early stages of development. Additional enhancements to the application could include building in alternate route trip data, integration of travel modes, information on alternative fueling station locations, and coordination with merchants to provide incentives from proximate businesses when a travel delay is anticipated.
2. **I-70 Rolling Speed Harmonization Pilot** – This strategy builds on preliminary efforts of CDOT to pilot rolling speed harmonization on eastbound I-70 from Eisenhower/Johnson Tunnels to Georgetown. Speed Harmonization reduces energy use by reducing congestion and smoothing traffic flow thereby reducing unnecessary idling and reducing travel time. This strategy uses variable speed limit signs and law enforcement to regulate speed and reduce turbulence providing congestion relief measures with safety benefits.
3. **Truck Fleet Enhancements** – This strategy incorporates enhancements that increase the aerodynamics or fuel efficiency of a truck. This strategy builds on the EPA SmartWay program, a voluntary grant funded effort to assist trucking companies with the purchase of add-ons to reduce NOx and GHG emissions. Two EPA SmartWay strategies identified were: low rolling resistance tires and truck fairings.
4. **Enhance transit traveler information and improve scheduling/fares** – One example of a component of this strategy is RTD's Smart Card program. Smart Cards are prepaid passes for bus and light rail that can be used by both monthly pass holders and annual Eco Pass holders. Advantages of the Smart Card include improved bus boarding and decreased idling time, and the ability to offer niche fares. Other elements include enhanced real-time traveler information.

Measuring GHG Impacts

A Data & Measurement Work Group analyzed the petroleum displaced (in gallons) and CO₂e emissions (in metric tons) for some of the priority strategies. This served to put into practice the analysis required for including energy in decision-making. Lessons learned included:

- Data and modeling tools are available, though data collection took time, particularly since data needed to be collected from a variety of agencies.
- The relative scale of impacts of various strategies varied quite widely, primarily based on scope, e.g., from regional pilot projects to statewide implementation.
- There is no single action that will make all the difference, but rather, a series of actions will add up to meaningful energy reductions and dollars saved.
- Diverse assumptions made some strategies difficult to scope.
- Synergies among several of the strategies could create additional benefits.
- Encouraging citizens to consider the role of energy in their transportation decisions will require additional education and thus the Energy Literacy program is a priority.

Next Steps

A summary of the Energy Smart Transportation Initiative collaborative process, strategy development, results of analysis, and recommendations for next steps will be documented in a report developed in early 2012.