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Transportation and Land Use (TLU) Technical Work Group

Summary List of Pending Priority Policy Options for Analysis

	Policy Option	GHG Reductions ($MMtCO_2e$)			Net Present Value 2009–2025 (Million $)	Cost-Effectiveness ($/tCO_2e$)	Level of Support
		2015	2025	Total 2009–2025			
TLU-1	Infrastructure for Plug-In Vehicles	*Study Option*					Pending
TLU-2	Research and Development for Renewable Transportation Fuels	*Incorporated into Analysis for TLU-3*					Pending
TLU-3	Alternative Fuel Development and Expansion	*In Process*					Pending
TLU-4	Smart Growth, Pedestrian and Bicycle	*In Process*					Pending
TLU-5	Improve and Expand Transit Service and Infrastructure	*In Process*					Pending
TLU-6	School and University Transportation Bundle	*In Process*					Pending
TLU-7	Promote and Facilitate Freight Efficiency	*In Process*					Pending
TLU-8	Procurement of Efficient Fleet Vehicles (Passenger and Freight)	*In Process – to be quantified in two parts (A – LDV) and (B- HDV)*					Pending
TLU-9	New Vehicle Standards: Tailpipe GHG and Fuel Economy	*In Process*					Pending
TLU-10	Public Education	*May be Quantified only for LRRT Tires*					Pending

Note: The numbering used to denote the above pending priority policy options is for reference purposes only; it does not reflect prioritization among these important draft policy options.

TLU-1. Infrastructure for Plug-In Vehicles

Policy Description

Depending on the degree to which power generation in Arkansas relies on fossil fuels now and in the future, an increased introduction of plug-in vehicles may reduce greenhouse gas emissions in the state. The goal of this option is provide a set of actions that would further evaluate the benefits and feasibility, and accelerate the deployment of this technology, remove barriers to more rapid adoption, create initial incentives and provide for the integration of PHEVs with other systems, including the power system and the transportation system.

Policy Design

Review the forthcoming three-year national study (which began in 2007) by the Electric Power Research Institute (EPRI), Ford Motor Company, and Southern California Edison (SCE), which will developing and evaluating technical approaches for integrating plug-in hybrid electric vehicles (PHEVs) into the nation's electric grid system. Subsequently, after 2010, consider implementing some or all of the following:

1. Direct the State to undertake a study to assess impacts of plug-in fleets on state power infrastructure at various levels of market penetration, and to identify technology and system requirements to maximize use of off-peak and underutilized power resources. Ask the state to engage power utilities as partners in the study and to consider the future sources of power generation and their impact on GHG emissions from PHEVs currently and in the future.

Because car makers are preparing to introduce plug-in electric cars by 2010, and because it will be advantageous for car owners to plug in at night, utility companies should be encouraged, and compensated for, installing "smart meters" allowing time-of-day pricing for plug-in vehicles.

2. Provide funding for state and local government conversions of standard hybrids to plug in. Set a goal for <xxx> conversions at <$10,000> each and allocate funding to reach that goal. Require that these vehicles be grid-aware and include funding for equipment to accomplish this task.

3. Provide funding for school districts to acquire plug-in hybrid school buses.

4. Through legislative action and/or executive order, commit Arkansas state government to purchase plug-ins as they become commercially available, allowing purchase at a price premium to reflect carbon-reduction benefits and reductions in state expenditures on imported fuels.

5. Direct the state to provide rate recovery for utility R&D investments in pilot tests of vehicle-to-grid systems.

6. Fund the study of an assessment of electric vehicle charging needs in state parking facilities.

7. Develop and fund at least one vehicle-to-grid pilot involving a fleet of public plug-ins parked in a state garage.

8. Fund a study by the state to identify Arkansas companies and economic sectors with potential vehicle electrification markets and develop a strategy to help Arkansas companies position for success in those markets.

Goals: Review the three-year national study (which began in 2007) by EPRI, Ford, and SCE, (estimated to be completed after 2010), and thereafter consider setting goals for other policy design options listed above.

Timing: As indicated above.

Parties Involved: TBD

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-2. Research and Development for Renewable Transportation Fuels

Policy Description

Provide funding to assist in the development of low-carbon fuels that are not yet commercially viable, such as cellulosic ethanol, along with an accurate analysis and recommendations of which renewable fuels will be the best options for the state, region, or city.

The University of Arkansas Division of Agriculture has expanded its involvement in research and education on biomass issues, especially biofuels. New faculty have been hired and others have redirected their efforts (i.e. plant breeding for alternative feedstock opportunities). The Division dedicated the recent higher education bond monies for capital improvements for new construction and renovation of the Rice Research and Extension Center at Stuttgart. Two laboratories in that facility have been designated as field biofuel laboratories. New resources are needed to expand both the research and extension output in these areas. Needed is capacity to work on by-products and co-products (e.g., increased uses for glycerin, a by-product of biodiesel production), new feedstocks, application of cellulosic technologies, marketing strategies, and policy information support systems. Support is needed for field stations to adapt to these changing crops in their research and education systems.

Policy Design

During the 2007 Regular Session of the General Assembly, appropriations bills were passed to support research and extension in the area of biofuels and other biomass products. However, none of them were funded. The Division earmarked $1.0 million from its general appropriation for this important area, but recent reductions in the FY09 forecast have caused those funds to be redirected to operational issues. In order to move the biofuel and biomass programs forward, the $1.0 million of redirected funds needs to be replaced, and an additional $3,254,708 must be provided to pay for classified and non-classified salaries, extra help, staff benefits, maintenance and general operations.

Goals: The State will provide continuing annual funding in the amount of $4,254,708 for program enhancement for biofuels and other biomass. (from state biofuels bill – drawn from HR 1379 --title -- bill proposal)

Timing: Legislation passed in 2009 Regular Session with funds available FY2009-10.

Parties Involved: University of Arkansas Division of Agriculture.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

House Bill #1379, dated 02/28/07. For an Act to be entitled: An act to create the Arkansas Alternative Fuels Development Program.

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

Will be quantified, as appropriate, as part of TLU-3

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-3. Alternative Fuel Development and Expansion

Policy Description

Arkansas could adopt standards that require a certain amount or percentage of fuel sold in within the state to be alternative fuel (e.g., CNG, liquefied petroleum gas [LPG], ethanol, or biodiesel). This percentage could gradually increase over time. The state could help facilitate transition to alternative fuels by regulating quality standards for fuel blends.

Policy Design

The Commission could encourage state and national fuel industries to convert their products to contain suggested percentages of alternative fuels (that would produce less GHG emissions). The state could encourage industry and research universities to work together to create an Arkansas Alternative Energy Institute.

This policy could promote research and development (R&D) related to biofuel/biodiesel production, such as investigating the production biofuels from Arkansas based biomass feedstocks such as residues or byproducts from agricultural production (crop residues, chicken fat, beef tallow), agricultural processing, forest or wood resources, forestry of wood production (not being utilized by pulp mill plants), or other cellulosic crops (i.e. switchgrass). It could also include the reuse of food oils for use as biodiesel, possibly encouraging the production of "homemade" biofuels (for example, by farmers for their farm equipment). [A map showing the leading candidates for lignocellulose-based biofuel feedstocks can be found here: http://www.cast-science.org/websiteUploads/publicationPDFs/Biofuels%20Commentary%20Web%20version%20with%20color%20%207927146.pdf.] Such research could be linked to life-cycle analysis studies on feedstock production and conversion.

The Commission on Global Warming does not wish to encourage the conversion of any human food sources, such as corn, to alternative fuels, because this is likely to cause an increase in the price of food. The Commission also does not wish to encourage the production of alternative fuels that would lead to higher GHG emissions than are produced from the petroleum-based fuels.

Arkansas could provide incentives to private industries to establish alternative-fuel infrastructures that could aid in the promotion of alternative-fuel use. The expense of equipment and installation may be offset by the increasing use of these alternative fuels. The biofuel/biodiesel production plants should optimally be situated within a 50-100 mile radius of their feedstocks as feasible, with use of both rail and truck as appropriate and with a focus on minimizing the energy used to distribute the fuel. The distributors of alternative fuels should be in convenient locations to be able to offer fuels at competitive prices.

To aid in biofuel development, state money could be used to establish partnerships with state and national labs that have already worked on some of the issues of biofuel conversion. This would

bring knowledge of established production/conversion protocols into the state and develop processing parameters for Arkansas specific feedstocks.

Goals: Increase the use of alternative fuels that emit less GHG in automobile and other gasoline powered vehicles to 6 percent by year 2015. Develop industries within the state that produce alternative fuels.

Timing: By 2012, the State or appropriate agency will:

- Develop incentives for industry to produce non-food-crop alternative fuels that reduce GHG emissions.
- Develop an industry/research university institute that will continually work toward reasonable solutions for non-food-crop alternative fuels.

By 2020, the State or appropriate agency will:

- Reduce GHG vehicle emissions by converting to fuels that burn in a much more efficient manner (clarifying language for cleaner burning for air pollution effects, CO to CO2), with the goal of the statewide use of alternative fuels of 6 percent by year 2015.
- Work with the Arkansas Alternative Energy Institute to promote biofuel production to aid in control of GHG emissions and to promote state industries that will provide "green" jobs for Arkansas workers.
- Establish legislation to set standards for biofuel production that meets federal and state regulations for GHG emission levels.

Parties Involved: Department of Natural Resources, Department of Transportation, Department of Agriculture, Department of Economic Development, Department of Labor, Department of Forestry, Department of Energy.

Other:

Implementation Mechanisms

House Bill, listed below, may provide funding of some of the policy issues.

Related Policies/Programs in Place

House Bill #1379, dated 02/28/07. For an Act to be entitled: An act to create the Arkansas Alternative Fuels Development Program.

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

This analysis will assume a "fuel-neutral" low-carbon fuels policy requiring increased use of biofuels that could be met by a variety of scenarios. A sample scenario will be generated (e.g., 10% ethanol use and 20% biodiesel use by 2020) that would achieve the stated goal for overall increase in biofuels use to 6% of total fuel consumed in Kansas.

Data Sources:

Lifecycle impacts of biofuels obtained from Argonne National Laboratory's GREET model (v1.7). Fuel consumption, economy, and prices will be obtained from Energy Information Administration's Annual Energy Outlook.

Quantification Methods:

A ramp-up period will be assumed between implementation of policy and year of goal. Full life-cycle will be included in factors used to calculate

Key Assumptions:

- Program starts in 2010, first year of emission reduction
- Program reaches goal of alternative fuels as 6% of total fuels consumed in Kansas by 2020.
- Program applies to all on-road vehicles, "replacing" current gasoline and diesel fuel.
- Baseline accounts for:
  - 0% ethanol existing market share
  - 0% existing biodiesel market share.

Key Uncertainties

If non-food sources are required as part of the policy, then the mix of fuels assumed in the analysis would be significantly restricted, and quantification of GHG reductions would be difficult because of limited information regarding when biofuels from non-food sources will be available.

Also, transportation fuel providers would need to undertake changes in their production and distribution methods in order to achieve the goals. Because the policy does not prescribe particular technology pathways, there is uncertainty surrounding which fuels and technologies fuel providers will use to meet the standard. The program assumes that providers will use the most cost-effective options to meet the standard, but compliance costs are unknown at this time.

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-4. Smart Growth, Pedestrian and Bicycle

Policy Description

This policy focuses on incentives and programs to encourage smart growth, including enhancing the pedestrian and bicycle infrastructure. Current land use development practices increase vehicle travel by dispersing destinations, which separates activities and favors automobile travel over alternative modes. "Smart Growth" planning by local, regional, and state governments refers to development that reduces sprawl and maximizes environmental, fiscal, and economic resources. It incorporates such planning tools as mixed use, open space protections, downtown revitalization, brownfield redevelopment, infill development, transit-oriented development, and pedestrian and bicycle infrastructure. It seeks to preserve open, recreational, and agricultural space and to prevent sprawl, especially on the periphery of urban areas where sprawling development may otherwise occur.

It is hard to envision a solution either global warming or energy security that does not involve slowing the growth of our transportation emissions. To date, the national discussion of climate and energy initiatives has focused on technological solutions, namely developing more fuel-efficient vehicles or lower-carbon fuels. Experts recognize, however, that all such technological solutions will be overwhelmed by the continued growth in automobile travel, thanks to our increasingly spread out, car-dependent development patterns. During the period 1982-2002, these land-intensive development patterns caused development acreage to increase at twice the rate of population growth. This in turn caused per-capita vehicle miles traveled (VMT) to increase three times faster than America's population growth over that same period. It's no accident that VMT is increasing as we continue to build and develop more areas where residents have no realistic choice but to drive long distances each day to meet their daily needs. A 2002 study by Smart Growth America http://www.smartgrowthamerica.org/climate.html found that the degree of sprawl was the most significant cause of a high VMT.

The good news is that we can make enormous progress simply by shaping future building to create communities where people can accomplish more by driving less. Numerous studies now demonstrate that when people are given the option to live in a less automobile-dependent place, they do indeed drive less. According to the report Growing Cooler: The Evidence on Urban Development and Climate Change http://www.smartgrowthamerica.org/gcindex.html, residents of more compact neighborhoods drive 20-40% less on average, saving oil and reducing greenhouse gas emissions. If we combine compact neighborhoods with increased investment in public transit of all shapes and sizes (Policy Option TLU-6), the resulting synergies can reduce dangerous emissions enormously.

Policy Design

The Commission proposes several Smart Growth initiatives:

- Downtown Revitalization: Many U.S. towns and cities are crowded during business days but deserted by night and on weekends because few people live there. Some cities have begun turning this problem around by revitalizing their downtowns. Downtown revitalization can be profitable (by re-using existing infrastructure), provide a better quality of life (by centralizing entertainment and retail, providing a critical mass for success), and improve the environment (by reducing VMT, providing sufficient density for walking, bicycling, and transit, reducing sprawling edge development, and preserving greenfields). Arkansas should provide economic development incentives and liberalized zoning and permitting processes (parking requirements, density restrictions, mixed-use restrictions, etc.) to encourage investment in central business districts.

- Brownfield Redevelopment: "Infill" development of all sorts reduces sprawl and VMT. Redeveloping brownfields (empty or underutilized industrial facilities and derelict properties in urban areas) has the additional advantage of improving the quality of life in city centers, which increases the number of downtown residents, workers, and visitors. Arkansas should provide economic incentives, liberalized zoning and land use restrictions, and streamlined permitting processes, to encourage brownfield redevelopment. This can be a key factor in urban revitalization by providing new centrally-located areas for residential, commercial, or mixed-use development. It also reduces average trip distances, and encourages walking, bicycling, and public transit.

- Infill Development: Development of vacant or under-used parcels of land within existing developed areas reduces average trip distances and saves public funds by taking advantage of existing infrastructure and public utilities. By increasing the local population density, it also encourages walking, bicycling, and public transit. Arkansas should provide economic incentives, liberalized zoning and land use restrictions, and streamlined permitting processes, to encourage infill development.

- Transit-Oriented Development (TOD). TOD is the creation of compact, mixed-use commercial or residential communities designed to maximize access to public transit (see Policy Option TLU-6) while also creating a community attractive to pedestrians and bicyclists. TOD thus reduces VMT and the associated greenhouse gas emissions. Arkansas should provide economic incentives, liberalized zoning and land use restrictions, and streamlined permitting processes, to encourage TOD.

- Reducing sprawl: In order for smart growth policies to be truly effective, the efforts must be regional or, better yet, state-wide. If all municipalities in an area are not practicing smart growth, development may gravitate to greenfields at the edges of cities or between cities, resulting in sprawl. Arkansas should adopt a comprehensive plan to preserve open space on the edges of urban areas where sprawling development may otherwise occur, and to encourage regional cooperation in reducing sprawl. One approach would be to encourage "green zones" at the edges of cities that would be permanently zoned for agricultural use only, and off limits to developers. For further discussion, see http://www.smartgrowthamerica.org/openspace.html.

- Bike and Pedestrian Infrastructure: Smart growth aims to encourage alternative (non-automobile) transportation modes, especially including walking and bicycling. This requires infrastructure aimed at pedestrians and bicyclers. Arkansas towns, cities, and counties should improve and construct sidewalks and bikeways, and the state should provide economic incentives to encourage such developments. This is particularly true in commercial areas without adequate sidewalks and in residential and other areas where pedestrian and bicycle safety is a concern. The attraction of bicycling and walking is greatly enhanced by facilities that are safe and that also "feel" save to bicyclers and walkers. Bikeways can take the form of designated bike lanes on shared streets, or of trails that are separated from roadways except at crossings. The former are typically four or more feet wide. Separate bike trails are usually designed as multi-use trails that also serve joggers, strollers, skaters, etc. Bikeways are not just for recreational use; they also serve commuters, shoppers, school children, and others. Indeed, it is by using bikeways for transportation that real reductions in automobile VMT can occur. For example, in Scandinavian countries, despite the cold weather, 30% of all commuters commute by bicycle. Other infrastructure improvements could include bicycle parking and shower or locker amenities at places of employment. Cities, regional jurisdictions, and universities can institute "free bicycles" programs as is done in many U.S. and European cities. Arkansas should require "complete streets" policies, providing for systematic adoption of sidewalks and bikeways to help achieve these goals.

- Smart Growth Planning, Modeling, and Tools: Arkansas should provide state funding, information dissemination, and technical assistance to facilitate the adoption of smart growth planning processes, models and tools by local and regional jurisdictions.

Goals:

By 2010, begin providing economic development incentives and liberalized zoning and permitting processes (parking requirements, density restrictions, mixed-use restrictions, etc.) to encourage investment in central business districts.

By 2010, begin providing economic incentives, liberalized zoning and land use restrictions, and streamlined permitting processes, to encourage brownfield redevelopment, infill development, and TOD.

By 2010, develop and adopt a comprehensive plan to preserve open space on the edges of urban areas where sprawling development may otherwise occur, and to encourage regional cooperation in reducing sprawl.

By 2015, require "complete streets" policies, providing for systematic adoption of sidewalks and bikeways. (requires policy – performance goal) --

By 2010, develop a program for information dissemination, and technical assistance to facilitate the adoption of smart growth planning processes, models and tools by local and regional jurisdictions.

Timing: See above, with most strategies to be achieved by 2010.

Parties Involved: TBD

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Need to clarify what baseline would be and then shift to that --

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

This analysis considers potential GHG reductions from reductions in VMT for personal (non-truck) travel, as a result of a shift towards more compact development patterns. The analysis relies on estimates of per-capita VMT by Census tract population density range, as developed by Polzin, *et al* for the Center for Urban Transportation Research (CUTR) VMT forecasting model. The CUTR model is based on analysis of 2001 Nationwide Household Travel Survey data. The model provides estimates per-capita VMT by state for five density ranges. The model is currently set up for years 2005, 2035, and 2055; for this analysis, results were interpolated for CCS analysis years.

The observed relationship between per-capita VMT and population density is a rough proxy for the effects of Smart Growth development as described above. Higher levels of population density are associated with overall shorter trips because destinations are closer together. In addition, areas with higher population densities are more likely to have pedestrian-friendly design (walkability, mixed-use, etc.) and to support transit service. It is difficult to separate out the individual effects of the various Smart Growth strategies at this aggregate level of analysis, but the analysis should provide an indicator of what can be achieved through a combined set of Smart Growth policies.

Data Sources:

- Total population and population density by Census tract, 1990 and 2000.
- Per-capita VMT by Census tract population density in Arkansas, from CUTR VMT forecasting model.
- Forecast statewide population growth.

Quantification Methods:

The specific method used to estimate GHG benefits of Smart Growth strategies is as follows:

- Total population in 2000 is identified by five Census tract density ranges as identified in the CUTR model (<500, 500 – 1,999, 2000 – 3,999, 4,000 – 9,999, and 10,000 or more persons per square mile).

- The change in population from 1990 to 2000, and associated share of change by density range, is identified from Census data.

- For the Baseline scenario, new population growth between 2000 and 2030 (as determined from CCS baseline assumptions) is allocated to tract density ranges based on the share of growth in the 1990-2000 timeframe.

- The proportion of existing housing stock (population) that would be redeveloped over this timeframe is estimated at 15 percent, of which two-thirds is redeveloped in place and one-third is redeveloped elsewhere, with this redevelopment allocated to tract density ranges based on the 1990-2000 share of population growth. (The 15 percent and two-thirds figures come from the 2007 Growing Cooler report Section 1.7.3, citing analysis of Census data by Nelson (2006)).

- For the Climate Action scenario, a significant shift in the proportion of new development and relocated redevelopment is assumed to take place, with higher-density tracts (>2,000 persons per square mile) receiving 50 percent of new development under this scenario compared to only XX percent under the Baseline scenario. Total population by tract density under this scenario is then calculated.

- Total personal-travel VMT is calculated under the Baseline and Climate Action scenarios, based on VMT per capita (from the CUTR model) and total 2030 population by tract density range, and the percent reduction in personal-travel VMT is calculated.

- The percent reduction in VMT is adjusted by 90 percent to estimate the percent reduction in GHG emissions. This factor is the same as used in the Growing Cooler report to account for the fact that higher-density areas may experience somewhat lower travel speeds and therefore slightly reduced fuel economy.

Key Assumptions:

- Fraction of new population growth and redevelopment by Census tract density, under Baseline scenario.

- Assumed shift in fraction of new population growth and redevelopment from lower-density to higher-density Census tracts, under Climate Action vs. baseline scenario.

- Percent of residential building stock redeveloped (off-site) over the analysis timeframe.

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Cobenefits of actions – of activities

Possibility of owning – one less car – cost to consumer -- sharpening to qualifications --

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-5. Improve and Expand Transit Service and Infrastructure

Policy Description

Improvements to existing transit service and expansion of transit routes can shift passenger transportation from single-occupant vehicles to public transit, thereby reducing GHG emissions. This mitigation option involves a number of actions to be undertaken by state government, local government and transit agencies.

Policy Design

Goals: Implement transit investments that encourage greater use of public transportation, such as the following:

- Improve service frequency on selected existing intra-, and inter-city transit routes.
- Support and encourage improvements in intra-, and inter-city bus service.
- Reduce travel times on selected existing transit routes (signal prioritization, exclusive lanes, etc.).
- Improve service quality on selected existing transit routes (safety, cleanliness, improvements to shelters/stations).
- Provide financing, regulatory relief, and the use of eminent domain to develop and expand transit service and infrastructure (commuter rail, light rail, bus).
- Offer incentives to potential passengers and provide loans and/or subsidies to operators (public or private) to offer improved and less expensive intercity bus service.
- Provide financing, regulatory relief, and the use of eminent domain to develop, publicly or privately, a high speed intercity passenger rail system serving major urban areas. Provide additional financial assistance to improve services already provided by Amtrak on other routes.
- Reduce light duty urban VMT.

Timing: Reduce light duty vehicle total VMT in urban areas off 2008 baseline growth by 1 percent per year starting in 2010 until 2025.

Increase investment in transit service and infrastructure by 2015.

Parties Involved: TBD

Other: TBD

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

Arkansas Statewide Long-Range Intermodal Transportation Plan 2007 Update

Regional long-range transportation plans, including possibility of passenger rail in northwest Arkansas.

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

This analysis examines the reductions in GHGs possible from a shift from personal motor vehicles to transit, which emits fewer GHGs per passenger mile. The calculation of GHG reductions must account both for the reduction in the number of private vehicle miles, but also the partially offsetting increase in transit vehicle miles traveled. In addition to these direct reductions from individuals' shift of modes, two more long-term, indirect effects will be estimated. The shifting of trips from personal vehicles to transit can reduce the number of vehicles on the road, and thus the amount of congestion in urban areas. Reducing congestion improves traffic flow and can improve actual average vehicle fuel economy achieved. Studies have also demonstrated that increased transit service can help shape land-use patterns, enabling densities and proximity to the center of urban areas. This has been demonstrated to result in reduced VMT by those living in transit corridors, even if they never use transit.

Data Sources: [TBD, as approved by the TWG]

- Current and historical transit ridership, by mode type (urban/rural, bus or paratransit) – from National Transit Database and/or state sources
- Operating cost per passenger and per passenger-mile, by mode type (urban/rural, bus or paratransit) – from National Transit Database and/or state sources
- Revenue per passenger and per passenger-mile, by mode type (urban/rural, bus or paratransit) – from National Transit Database and/or state sources

Quantification Methods:

Direct quantification will be undertaken for improvements in service frequency, travel time reductions, the introduction of new and expansion of existing routes and services.

Travel time improvements provide a well-documented means of improving transit service and ridership. There is a direct benefit to riders as the improved service reduces their "generalized cost" (time cost plus financial cost) of their trip. In addition to co-benefits in improving service

frequency, there is about a -0.4 elasticity for transit travel time. Estimated percentage reductions in travel time will be multiplied by this elasticity to calculate the ridership increase

Service frequency increases ridership from existing riders and attracts new riders. As waiting time between vehicles has been shown to be valued about two times more strongly on average than actual travel time, this mechanism can prove very effective. There is a reported -0.5 elasticity for service frequency alone (time between buses), while the aggregate impacts for service improvements in time between vehicles and travel time have shown an elasticity of between -0.6 and -1.0, incorporating the time and frequency impacts of aggregate increases in service miles provided. As above, the service frequency elasticity will be applied to improvements in this parameter. As a redundancy check, the aggregate elasticity will also be applied to the total increase in vehicle revenue service miles to capture both factors together.

For service expansions and introduction, both the literature and a first-order statistical analysis show a long run elasticity for service expansion of between 0.6 and 1.0. This elasticity will be applied to service increases assuming that its full value will not be reached for five years for bus services. The elasticity will be prorated in the intervening years to show the lagged benefits of service expansion.

Estimates for the effects of new light rail and commuter rail services and the improvement of Amtrak services will be based upon information from projects in similar urban areas in other states due to the lack of historical data in Arkansas.

Key Assumptions:

Transit services can be expanded and introduced at the same average operating cost as current services.

New or improved services will be able to attract ridership in a manner consistent with service improvements in other similar areas of the country (i.e., the Arkansas transit market is not at saturation). Current fuel price increases provide a strong argument for this assumption.

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-6. School and University Transportation Bundle

Policy Description

In 1969, approximately 50% of students walked or biked to school; by 2001 it was less than 16%; 25 % of auto commute trips take K-12 and college students to school. Parents are influenced to drive children to school by distance from school, an unsafe travel environment, fear of crime, and bad weather. This burns a lot of fossil fuel and teaches students to travel by car instead of healthier alternatives such as walking, bicycling, busing, and car pooling. Public schools and colleges are well positioned to effect the changes in transportation habits that Arkansas needs if it is to reduce automobile use.

Policy Design

This policy focuses on encouraging reduced transportation sector greenhouse gas emissions at schools, colleges, and universities through the following:

- K-12 schools will establish programs such as ride sharing, ride-sharing clearing houses, supervised walking to school including "walking school buses," safe routes to schools, bicycling and mobility education that shows how people benefit from using alternative transportation and that makes it "cool" to walk, bicycle, or ride the bus. Buses are far safer than driving to school, especially when the car driver is a student. The federal "Safe Routes to School" program provides money for local sidewalks and crosswalks; see http://safety.fhwa.dot.gov/saferoutes/.

- Schools can save dollars by reducing or abolishing student parking. Student parking should be neither free nor subsidized but should reflect the true cost of the lot and land. Schools can restrict student parking to seniors only, or to outstanding students only. School siting policies should favor small, centrally located schools to encourage alternative transportation while minimizing driving distances. Arkansas' excessive minimum acreage requirements favor Greenfield sites, one-story buildings, big parking lots, and inefficient planning; they need to be revised. Within a one mile radius of any school, state and local planners should design streets and sidewalks for pedestrians, bicycles, and children. Schools should factor in a transportation energy component in their calculation of building energy ratings. Arkansas could reduce student injuries and death while reducing greenhouse gases by raising the legal driving age to 16 for a learner's permit as 10 states have done, and to 17 for a full license as New Jersey has done.

- K-12 is a critical time to teach children the environmental, health, and other consequences of automobile overuse. These consequences, and the importance of reducing driving and reducing gasoline consumption, need to become a normal part of all environmental lessons in health, biology, physical science, and environmental science courses at all ages.

- Colleges can establish free bus programs for students, bicycle storage buildings, free student bicycles, and abundant multi-family housing on or near campus with services (food, drugstore, etc.) nearby. Student parking on campus should be neither free nor subsidized but

should reflect the true cost of the lot and land. Arkansas colleges can require 1st year, or 1st and 2nd year, students to live on campus while requiring that their cars be stored in distant lots for out-of-town travel.

Goals: By 2012, K-12 schools will establish programs such as ride sharing, ride-sharing clearing houses, supervised walking to school including "walking school buses," safe routes to schools, bicycling and mobility education that shows how people benefit from using alternative transportation and that makes it "cool" to walk, bicycle, or ride the bus.

By 2012, high schools will establish programs to reduce or abolish student parking.

By 2012, K-12 schools will develop a program to teach students about the environmental, health, and other consequences of automobile overuse.

By 2012, colleges will establish more comprehensive commuting programs, such as free bus programs, expanded bicycle storage, free student bicycles, and abundant multi-family housing on or near campus with services (food, drugstore, etc.) nearby.

By 2010, colleges will study and report on the environmental, health, financial, and other costs and benefits of requiring all freshmen to live on campus while leaving their cars in distant lots for out-of-town travel only.

Timing: See above.

Parties Involved: TBD

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

Arkansas Safe Routes to School Program

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Reductions in the shorter term will come primarily from mode shifting to ride-sharing, walking, and cycling in the short-term. In the longer-term, school siting and sizing will allow greater baseline penetration of each of these modes, increased feasibility of bus usage, and shorter trip distances for all of these modes as well as trips by personal motor vehicle.

Data Sources: [TBD, as approved by the TWG]

- School enrollment, separately for K-10, 11 and 12 (approximate driving age high school enrollment), and post-secondary (Colleges and Universities).
- Average school size, by level (primary, junior high, secondary, colleges)
- State school bus fleet and utilization.
- Current mode splits.

Quantification Methods:

Percentage improvements/increases in the penetration rate for non-motorized access will be taken and applied from programs such as the "walking school bus," the national pedestrian and bicycle clearinghouse, Safe Routes to School, university student commute trip benefit programs, etc.

Via interview with state officials or comparison with peer states, an estimate of the number of students driving to school will be made. Upon agreement with the TWG, an estimate will be made of the number of spaces that can be eliminated (e.g., rural students may have few/no options) and the phase-out period.

Ride-matching will be estimated by examining the NHTS to determine average vehicle occupancy for current school trips (e.g., siblings, current ride-sharing) and estimating what additional penetration may be available for non-fully occupied vehicles.

Key Assumptions: [TBD, as approved by the TWG]

Current mode splits from NHTS will be based on a collection of peer states and will be assumed to be similar for Arkansas.

Estimates will need to be derived of the number of available seats for ride share based on vehicle occupancy and assumptions regarding the vehicle fleet (e.g., mini-vans).

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-7. Promote and Facilitate Freight Efficiency

Policy Description

This policy focuses on promoting and facilitating freight efficiency through:

- Improvements in railroad infrastructure and rail yards;
- Increasing rail capacity, which may allow some freight to shift from trucks to rail;
- Providing economic assistance and regulatory streamlining for the improvement of intermodal rail yards and the relief of rail freight bottlenecks;
- Providing electrification at truck stops to reduce idling;
- Supporting and promoting policies and legislation that improves regulatory oversight of the railroad industry;
- Providing plug-in power at port sites to enable vessels to turn off engines and reduce idling;
- Supporting state and federal legislation to allow heavier tractor semi-trailer weights on highways.

Policy Design

Improving freight efficiency by expanding the use of short-haul rail over trucking alternatives will require a fundamental shift in regulatory oversight of the railroads. This will require the adoption of federal legislation reforming the Surface Transportation Board, reversing anticompetitive practices and creating an obligation to serve. The combination of mergers, bottleneck rules, paper barriers, and antitrust exemption creates an environment that often eliminates competition and alternatives for small or captive shippers.

The State should take an active role in influencing national rail policies that improve railroad infrastructure, increase rail capacity and improve rail yards to improve inter-modal options.

Technologies to reduce heavy vehicle idling are readily available and cost effective for long-haul trucking, and include auxiliary power units and truck stop electrification. According to Argonne National Laboratory, long-haul trucks idle an average of 6 hours per day or 1,830 hours per year consuming 20 million barrels of diesel fuel. The use of existing technology can reduce fuel use by 90%.

Today, nearly 2 million tractor trailers are registered in the United States. Between 1990 and 2006, total truck tonnage increased nearly 40%. It is estimated that truck tonnage in the United States will increase almost 30% by 2018 to about 14 billion tons, up from nearly 11 billion tons in 2006. Much of this traffic routes its way through the State of Arkansas and we need to focus on methods of "reducing the number of trucks needed to haul commerce" as well as offer incentives to truck carriers that invest in low emission engines.

Typical switcher locomotives idle 75% of the time accounting for 27% of their total fuel use. Conversion to electrification may be impeded by both institutional factors and access, both

perceived and actual, to necessary infrastructure. A check of the DOE truck stop electrification site locator shows three facilities within a 100 mile radius of Little Rock.

Policies should also be supported that allow trucks to haul more material by weight to reduce the number of trucks needed to deliver goods.

Goals: Support passage of legislation by July, 2009 that:

- Restores antitrust laws to the railroads.
- Reforms the Surface Transportation Board in a manner that reverses anti-competitive rulings, protects the public interest, creates a proactive STB that will investigate unreasonable rail practices and creates and enforces an obligation to serve standard.
- Requires timely investments in rail infrastructure including increased rail capacity and rail yard enhancements to accelerate inter-modal transportation and truck to short-haul rail.
- Establishes standards for truck stop electrification by August, 2009 determining the appropriate technology, such as Idle Aire or Shorepower systems that will provide an alternative to idling or auxiliary power units. Establish a reasonable conversion period for transient vehicles and Arkansas based organizations to retrofit and adapt their systems before assessing the need for restrictive ordinances.
- Completes a similar assessment of port facilities and rail switching yards to determine the cost/benefits by mid 2010.
- Allowing states to haul 97,000 pounds on six-axle trucks will allow the same amount of freight to be transported on fewer trucks, reducing energy consumption and emissions.
- Allows longer length tractor semi-trailers (double 48s) on highways to reduce VMT.
- Provide incentives to trucking companies that invest in the purchase of low emission engines and light weight tractor/trailer combinations.

Timing: See above.

Parties Involved: TBD

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Quantification Methods:

Estimate the reduction in CO2 emissions from reduced idling based on estimating the portion of emissions and fuel consumption in the AR inventory that is attributable to Class 8 diesel trucks, estimate the portion of the total fuel consumption that would be consumed during idling, and apply a targeted reduction of 80 percent to this amount starting in 2008 and a reduction of 100 percent starting in 2015.

Allowing longer length tractor semi-trailers and 97,000 pounds on six-axle trucks largely depends on the willingness of surrounding states to concur on the policy of switching to longer trucks for their seamless operation across states for limiting VMT by allowing freight to be transported in heavier loads and fewer vehicles. A national freight commodity flow survey will be used to determine the number of truck trips either completely within Arkansas or traveling only through states permitting heavier of longer-combination vehicles. A penetration factor for these vehicles in these markets will be estimated (e.g., to account for equipment availability, shipper preference, etc.). Percentage reductions based on fuel efficiency improvements per ton-mile will then be calculated.

Key Assumptions:

This analysis will assume idle reductions are achieved only by Class 8 diesel truck population; these trucks idle for an average of 6 hours per day; they consume 0.8 to 1.2 gallons of diesel per hour during idling; and that a 80 (by 2010) or 100 (by 2020) percent reduction of diesel idling from these Class 8 trucks will be achieved. The cost analysis will assume a 5-year lifetime for idling technology equipment, applied to 80 percent of Class 8 vehicles starting in 2008 and 100 percent of Class 8 vehicles starting in 2015, at a cost of $6,000 per vehicle and a $X.XX per gallon diesel cost. Program administration costs, enforcement costs, and fines have not been factored into the cost analysis. Reduced vehicle maintenance costs have not been factored into the analysis.

Data Sources: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-8. Procurement of Efficient Fleet Vehicles (Passenger and Freight)

Policy Description

Arkansas state and local government agencies should "lead by example" by enacting procurement policies and or joining EPA SmartWay program and utilizing the Smart Way Upgrade Kits that result in adoption of lower emitting vehicle fleets. There are three primary components of the of the EPA Smart Way program: 1) creating partnerships between shippers, carriers, and program sponsors; 2) reducing all unnecessary engine idling; and 3) increasing the efficiency of light duty vehicles, heavy duty vehicles, rail, and intermodal operations.

This policy option strengthens Arkansas' commitment to reduce GHG emissions through fuel efficiency in vehicles owned by the state while also encouraging private and public agencies to develop incentive programs that might, for example, help with the initial costs of purchasing such vehicles.

Policy Design

In leading by example, state government will ensure that its own fleet of vehicles meets or exceeds the targets set for the state as a whole, whole providing available means for all public and private vehicles to also exceed these standards on a voluntary basis.

Goals:

- By 2010, identify barriers to purchasing hybrid vehicles and research and develop solutions to procure hybrid or other lower GHG emitting vehicles in the state.
- By 2010, ensure the overall state of Arkansas fleet considers EPA fuel efficiency rating calculated over the life cycle of the vehicles purchased for the fleet.
- By 2015, ensure low carbon fuels are purchased for the state motor pool fleet wherever they are available and if applicable for the vehicle type.
- By 2019 the state will have a goal of at least 70% of all heavy duty vehicles and by 2014 at least 90% of all light duty passenger vehicles are "fuel efficient," meeting, on average, a higher mpg, for the state's heavy duty and light duty vehicle fleets.

Timing: See above.

Fleet issues – timing of fleet purchase…

Incentives – shape language – state agencies to look at mpg for vehicles --

Parties Involved: Arkansas state and local government agencies, private industries and fleets, trucking industry.

Other: TBD

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

[Passenger vehicle fleet still TBD, write-up below reflects heavy duty vehicles.]

GHG reductions and fuel cost savings will be reduced primarily through the purchase of more fuel-efficient vehicles. This will be accomplished both through the purchase of heavy-duty vehicles that are more fuel-efficient within their vehicle class, and better "right-sizing" of the State vehicle fleet so that vehicles of a heavier class are not purchased and/or utilized when a lighter, more fuel-efficient vehicle would suffice. Care must be taken to account for the fact that the State may dispose of some vehicles before the end of their useful life – this could imply the pushing of either less or more fuel-efficient vehicles into the non-State-owned vehicle fleet in Arkansas.

Data Sources: [TBD, as approved by the TWG]

- State heavy-duty vehicle fleet composition and utilization.
- Average annual heavy-duty vehicle acquisitions.
- State vehicle fleet diesel and bio-diesel usage.

Quantification Methods: [e.g., Full life cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Based on the 2010 initiation and 2019 70% goal, penetration of more fuel-efficient heavy-duty vehicles into the State fleet will be calculated and the percentage reduction in fuel use calculated.

Based on the 2015 low carbon fuel target, an estimate will be made of the potential penetration (accounting for national fuel availability) rate and the GHG benefits (using a life cycle analysis of fuel emissions) of using bio-diesel.

Key Assumptions: [TBD, as approved by the TWG]

Fleet turnover and procurement will continue at the same rate as previously. Accelerated procurement rates would be considered to displace less fuel-efficient vehicles into the non-State fleet more rapidly, counteracting some benefits.

Biodiesel is assumed to be the only low carbon fuel available by 2015 with the exception of for buses, which may also run on natural gas.

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-9. New Vehicle Standards: Tailpipe GHG and Fuel Economy

Policy Description

Arkansas could adopt new vehicle standards that would meet newly proposed federal and state greenhouse gas (GHG) regulations.

To meet the new vehicle standards, the state could set up a "feebate" system relating to new car/vehicle purchases. The state should present incentives to encourage its citizens to purchase new vehicles that are more fuel efficient and produce lower GHG emissions. The efficiency goals should be determined by the federal standards for the fleet average mpgs for cars and for light trucks, with this average changing over the years by vehicle class to comply with increasing fuel economy standards. These incentives could include reduced registration fees, rebates and/or tax credits to those purchasing vehicles. The incentives would be to those who purchase new vehicles that are more fuel efficient than average by charging a fee those who purchase vehicles that are less fuel efficient than average.

Two classes for light trucks – and for passenger vehicles – clarification language – whether or not or how to do so – weight class --

It is not the intent of the state to charge fees to those citizens who are netting less than a living wage, or workers undergoing financial hardship. Therefore the feebates should not include the purchase of used vehicles that would possibly be purchased by these citizens who may only have the means to purchase older vehicles that may not fit the category of lower-GHG emitters/more energy efficient vehicles.

Policy Design

Goals: Increase the percentage of vehicles that have lower GHG emissions and are more energy efficient by 6 percent by year 2015. Effect of overall fleet – goal for 6 percent of overall fleet efficiency --

Timing: Total time for impact of vehicle change was calculated for low-emission diesel at 5 years for competitive market and total impact time of 30 years. For gasoline hybrids, 5 years for competitive market to 35 years for total impact. For hydrogen fuel cell hybrid, competitive production of 15 years, total impact time of 55 years (Heywood, J. 2006. Fueling our transportation. In Scientific American, p. 62).

In the near-term, used vehicles could be exempted. In the future, the State could consider extending the program to used cars.

[LL notes: Used car emissions – standards – for inspections for – removed language – register vehicle from out of state – retirement of older cars – public education / -- car inspection programs]

By 2012, the State or appropriate agency will:

- Develop a program to help reduce GHG vehicle emissions by encouraging greater use of vehicles that are less GHG producing.

- Develop incentives and/or disincentives for purchasing of new lower GHG/more energy efficient vehicles.

By 2020, the State or appropriate agency will:

- Majority of vehicles on the road (greater than 50 percent) will produce less GHG emissions than the average for the US fleet, and be in federal and state compliance for GHG emission levels.

- Establish legislation to set standards for new vehicles with mandatory manufacture labeling.

Parties Involved: Department of Motor Vehicles, Department of Transportation, American and Foreign Automobile Industries, Environmental Protection Agency, State Energy Office

Other:

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

TLU-10. Public Education

Policy Description

This policy focuses on implementing public education programs to better inform the public of the measures individuals can take to reduce their transportation -related GHG emissions. Drivers will voluntarily reduce fuel use and GHG emissions from their activities when they have the information necessary to make proper decisions.

The option would involve development and implementation of a curricula that address the limiting of GHGs in transportation through:

- Education on transportation choices and consequences: low-GHG emitting vehicles, carpooling, use of alternative fuels, walking, biking, telecommuting, mass transit, safety issues, ridesharing in schools, etc.
- Improved vehicle operation and maintenance: regular vehicle tune-ups, fuel efficient tires, coolest temperature fueling, tire pressures, engine lubricants, slower acceleration, shifting at lower revolutions per minute, cruise control turn off vehicle when pared, elimination of "jack-rabbit" starts.

The curriculum would be a requirement for all driver training programs and distributed through other possible venues as deemed appropriate by the agency(ies) that develops the program. This program should include questions pertinent to training included on the written/driving portion of private and commercial driver licensing tests. (There are currently driver training programs in Utah and Arizona incorporating this type of curriculum in classroom settings.) In addition, programs that include this curriculum are to be mandated for both state and municipal fleet operators. All GHG saving application methods included in the curriculum would be enforced at state and municipality fleet levels.

In the interest of time and expense, it is recommended that existing curricula from such entities as DOE or National Energy Foundation be examined for application and modified as needed.

Policy Design

Goals: Reduce transportation GHG emissions through education to promote intelligent transportation purchasing choices and vehicle operation. However, this can not be quantified unless there are market penetration goals (e.g., for LRR tires, such as 5% by 2020, etc.). Unable to quantify effects of educational programs at this time.

Consumer information program would begin in 2008, with program expansion, as resources are made available.

Timing:

- By 2010, the State or appropriate agency would develop a marketing program for fuel efficient replacement tires and energy efficient driving practices and devices.

- By 2010, the State or appropriate agency would ensure that a training be delivered for all state and municipal fleet operators.

- By 2010, private and commercial driver licensing tests would be modified to incorporate information about fuel saving driving practices.

Parties Involved: Driver training programs, DMV, State, commercial and municipal fleets.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – At the GCGW meeting on May 19, 2008, a GCGW member recommended that the TWG work with the Dept. of Education to make science standards part of the curriculum.

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: Will not be quantified, other than tires-related programs.

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]