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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 ₂ e)			Net Present Value 2009–2025 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)	Level of Support
		2015	2025	Total 2009–2025			
TLU-1	Infrastructure for Plug-In Vehicles	<i>Not Yet Quantified</i>					Pending
TLU-2	Research and Development for Renewable Transportation Fuels	<i>Not Yet Quantified</i>					Pending
TLU-3	Smart Growth, Pedestrian and Bicycle	<i>Not Yet Quantified</i>					Pending
TLU-4 (new)	Procurement of Efficient Fleet Vehicles (Passenger and Freight)	<i>Not Yet Quantified</i>					Pending
TLU-5	Promote and Facilitate Freight Efficiency	<i>Not Yet Quantified</i>					Pending
TLU-6	Improve and Expand Transit Service and Infrastructure	<i>Not Yet Quantified</i>					Pending
TLU-7	School and University Transportation Bundle	<i>Not Yet Quantified</i>					Pending
TLU-8	Alternative Fuel Development and Expansion	<i>Not Yet Quantified</i>					Pending
TLU-9	Public Education	<i>Not Yet Quantified</i>					Pending
TLU-10 (new)	New Vehicle Standards: Tailpipe GHG and Fuel Economy	<i>Not Yet Quantified</i>					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 national study by the Michigan Public Service Commission on the impact of plug-in hybrid vehicles on the grid. The first report from this study is due June 30, 2009. Subsequently, after 2009, 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.
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 Michigan Public Service Commission study of the impact of PHEVs on the grid (first report due for completion in June, 2009), and thereafter consider setting goals for other policy design options listed above.

Timing: TBD

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.

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

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-3. 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" safe 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.

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.

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-4. 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 EIA Smart Way program: creating partnerships reducing all unnecessary engine idling, and increasing the efficiency of light duty and 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 agency fleets with the potential to develop incentive programs for local governments to 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, while providing available means for all public and private vehicles to also exceed these standards on a voluntary basis.

Goals:

- By xxxx, identify barriers to purchasing hybrid vehicles and research and develop solutions to procure hybrid or other lower GHG emitting vehicles in the state.
- By xxxx, 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 xxxx, ensure low carbon fuels are purchased for the state motor pool fleet wherever they are available and if applicable for the vehicle type.
- By xxxx, State will set a goal of at least 70% of all heavy duty vehicles and 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.

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]

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-5. 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 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;
- Enforcing anti-idling ordinances and/or encouraging the use of alternatives to idling;
- Providing plug-in power at port sites to enable vessels to turn off engines and reduce idling.

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 including; 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%. 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.

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.

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]

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-6. 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 by 6 [40?] percent by year 2015 compared to the year 2002 baseline scenario.

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]

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-7. 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 xxxx, 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 xxxx, high schools will establish programs to reduce or abolish student parking.

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

By xxxx, 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.

Within a year, 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]

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-8. 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). [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 be situated within a 50 mile radius of the site-specific feedstocks to feasible. 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 by 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, 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

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-9. 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 curriculum that address the limiting of GHGs in transportation through:

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

The curriculum would be a requirement for all driver training programs with 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.

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

Timing:

- By 2009, 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 – [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. 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.** These incentives could include reduced registration fees, rebates and/or tax credits to those purchasing such vehicles. In addition, there could be disincentives to those who purchase new vehicles that are relatively high GHG emitters and/or are not fuel efficient, by charging a fee those who purchase such vehicles.

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**.

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).

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 **xx** percent) will produce less GHG emissions (e.g., fuel economy of **xx** or greater), 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]