



Brief Descriptions of Catalog of State Actions Transportation and Land Use (TLU) Technical Work Group (TWG)

Note: Actions in blue type indicate options added by the Arkansas TLU Work Group.

TLU-1. PASSENGER VEHICLES

1.1 PASSENGER VEHICLE TECHNOLOGY

1.1.1 New Vehicle Standards: Tailpipe Greenhouse Gas and Fuel Economy

Federal fuel economy standards, federal greenhouse gas (GHG) standards, and state GHG standards all have an impact on the amount of GHG emissions from newly purchased vehicles.

1.1.2 ZEV/LEV-II Implementation

California's low-emission-vehicle (LEV)-II regulations establish fleet average emission standards to be achieved by 2010. The program extends passenger car emission standards to sport utility vehicles and pickup trucks and tightens overall emission standards. The program regulates smog and ozone-forming air pollutants.

LEV-II requires manufacturers to produce a minimum percentage of zero-emission vehicles (ZEVs), or a commensurate amount of near-zero-emission vehicles, per year. The vehicle types eligible for compliance include electric, hybrid-electric, and alternative-fuel vehicles, which have lower GHG emissions than traditional vehicle types. Under the Clean Air Act, states have the option of adopting and implementing California's LEV-II standards, which are stricter than current federal emissions standards.

1.1.3 Research and Development and Bringing to Market Lower-GHG Vehicle Technologies

Arkansas could support research and development (R&D) of low-GHG vehicle technologies to encourage technological innovation and accelerate the time period for bringing these technologies to market. Market expansion can also reduce unit costs for these newer technologies.

1.1.4 Vehicle Add-On Technologies (e.g., Low-Friction Oil and Fuel-Efficient Tires)

Both existing and newly purchased passenger vehicle fuel efficiency may be improved with incremental "add-on technologies." Some examples of such add-on technologies include low-friction oil or low-rolling-resistance tires (fuel-efficient tires).

Fuel economy can be improved on light-duty vehicles by setting minimum energy efficiency standards for replacement tires. Typically, energy-efficient tires are used on new models;

however, low-rolling-resistance replacement tires may not be readily available to consumers, and there is little information regarding the fuel economy of replacement tires.

1.1.5 Hybrid Buses

Urban public transportation buses could be powered by a hybrid diesel-electric engine, which may be able to provide fuel economy improvements as high as 50% over similar sized standard diesel engines.

1.1.6 Support Stronger Federal CAFE Standards

A state could encourage the federal government to adopt and implement stronger fuel economy standards for newly purchased vehicles.

1.1.7 Programs for GHG Emission Consumer Information for Newly Purchased Cars

To increase consumer awareness about GHG emissions, Arkansas could allow, encourage, or require that auto manufacturers affix a “global warming index” sticker to new cars and passenger trucks detailing carbon dioxide (CO₂) and other GHG emissions. These stickers would provide a comparison of the GHG emissions of one vehicle with the average projected emissions from other comparable vehicles of the same model year.

1.1.8 Develop Infrastructure for Plug-In Vehicles

Arkansas could develop infrastructure facilities for plug-in hybrids to recharge at rest areas and fueling stations on limited-access highways. These plug-in recharging facilities would provide consumers with more available locations for recharging and allow plug-in vehicles to extend their range to longer-distance trips.

1.2 PASSENGER VEHICLE OPERATIONS

1.2.1 Enforce Speed Limits

Reduced vehicle speeds can improve fuel economy, reduce GHG emissions, and improve safety. One potential implementation method for this enforcement includes speed-detection cameras, both for intercity highways and urban roads, which have been shown to be an effective and cost-effective means of achieving compliance with posted speed limits. Enforcement measures could be combined with measures to lower the speed limit on interstates, freeways, and major arterial roads. Significant enforcement resources may be needed for this measure to achieve the expected reductions.

1.2.2 Vehicle Maintenance and Driver Training

Improved consumer information and education can lead to an increase in fuel efficiency. Consumer education could include the use of “best in class” vehicle guides (e.g., American Council for an Energy-Efficient Economy) that provide comparative fuel efficiency information about different vehicles and also provide associated vehicle GHG emissions. Public education and training can make drivers more aware of maintenance issues that affect pollution and vehicle operating costs, including tire inflation and engine lubricants. Such public education may also encourage energy-efficient driving habits (notably, slower acceleration, shifting at lower

revolutions per minute, and use of cruise control) as well as encourage the use of lower GHG modes of transportation.

1.2.3 Improved Transportation System Management (e.g., Traffic Signal Synchronization and Intelligent Transportation Systems)

Improved transportation system management can improve vehicle flow on the roadway system, which reduces fuel use and GHG emissions. Coordinated operation of the regional transportation network can improve system efficiency, reliability, and safety. Tools to reduce traffic congestion include high-occupancy vehicle (HOV) lanes, roundabouts at appropriate intersections, synchronized signals, incident clearing and management, variable message signs, 511 and other real-time driver information, ramp metering, and other forms of intelligent transportation systems.

1.2.4 Driver Information Technologies, Including Pay-As-You-Drive Insurance

Driver information technologies can provide real-time information on driving habits that have an effect upon GHG emissions. Two important potential elements of driver information are use of on-board computers and displays that provide instantaneous fuel economy information and guidance on more fuel-efficient shifting for manual transmissions. With the introduction of global positioning system (GPS)-based pay-as-you-drive insurance, information can also be provided to drivers to increase their awareness of their minute-by-minute cost of driving.

1.2.5 Tune-Up Services, Including Tire Pressure Checks

Arkansas could allow, encourage, or require tune-up and on-demand oil change and engine check facilities to check tire pressure and inflate to the recommended pressure.

1.2.6 Passenger Vehicle Idling Restrictions

State or local government could enact stricter idling restrictions prohibiting idling for extended durations. States could also implement public awareness campaigns to encourage reduced idling.

1.2.7 School Education Programs

Arkansas could implement school instruction for grades 3 through 12 to educate students on the benefits of idling reduction and the consequences of not doing so. Such a curriculum could also address how students may broach this topic with parents or other drivers.

A “lower GHG” curriculum could be developed for teachers to use at the elementary and secondary system levels. Such a curriculum would both distribute information through children to their parents and educate future drivers.

1.2.8 Public Education

Arkansas could implement public education programs to better inform the public of the measures individuals can take to reduce their transportation-related GHG emissions.

1.3 PASSENGER VEHICLE INCENTIVES AND DISINCENTIVES

1.3.1 Procurement of Efficient Fleet Vehicles

State and local governments can provide incentives for public and private vehicle fleets to include low-GHG vehicles.

1.3.2 Feebates (State-Specific or Regional)

Arkansas could adopt a variety of programs to encourage purchase of lower-GHG vehicles. State incentives could include differential registration fees, feebates, and/or tax credits. Feebate programs are usually structured to provide incentives for reduced GHG emissions by creating (1) fees on relatively high-emission/lower-fuel-economy vehicles and (2) rebates or tax credits on low-emission/higher-fuel-economy vehicles.

1.3.3 CO₂-Based Registration Fees and Vehicle Licensing Fees

Higher vehicle registration fees could be charged for vehicles that have higher emissions, and vehicles that emit less can be charged a lower fee. Vehicle licensing fees could also be based on vehicle weight, with use of a dollar-per-vehicle-ton multiplier instead of the present broad categories of vehicle weight.

1.3.4 Tax Credits for Efficient Vehicles

Tax credits could be offered for the first-time purchase of a hybrid, alternative-fuel vehicle or other type of vehicle that is relatively lower in GHG emissions.

1.3.5 Vehicle Scrappage

State and local governments could adopt an incentives program to accelerate the replacement and/or retirement of passenger vehicles with higher GHG emission rates. Because of the energy input required for manufacturing new vehicles, keeping low-GHG emitters in the fleet longer would also provide benefits for vehicles that are well maintained.

1.3.6 Emission-Based Tolling (Discounts for Clean Vehicles)

More fuel-efficient vehicles could pay lower tolls than less fuel-efficient vehicles. This measure has been implemented for trucks in Germany.

1.3.7 Establish a Carbon Emission Tax, Modeled After the Clean Air Discount Bill

The Clean Air Discount Bill provides rebates to purchasers of vehicles that emit low levels of GHGs and places an additional surcharge on higher-emitting vehicles.

1.3.8 Establish a Fleet Replacement Grant Program

Arkansas could incentivize earlier retirement of older fleet vehicles by creating a grant program that helps vehicle owners purchase more fuel-efficient, lower-GHG-emitting vehicles.

1.3.9 Provide a Tax Incentive for Adult Bicycles

The state could provide an incentive for adults to purchase, use, and commute by bicycle. In England, this type of program allows employees of participating employers to choose a bicycle they will use, along with safety and security equipment.

1.3.10 Support Alternative Travel in the Advertising Mainstream

Arkansas could promote alternative travel, such as walking, cycling, and using trains, buses, and trolleys, through mainstream advertising media, such as TV, billboards, radio, and magazines.

1.4 FUEL-RELATED MEASURES**1.4.1 Low-GHG Fuel Standard (e.g., Renewable)**

This option would reduce GHG emissions by decreasing the carbon intensity of all passenger vehicle fuels sold in the state. The Low-Carbon Fuel Standard (LCFS) would require all fuel providers in the state to ensure that the mix of fuel they sell into the state market meets, on average, a declining standard for GHG emissions measured in CO₂-equivalent grams per unit of fuel energy sold. The state should regulate quality standards for low-carbon fuels. Low-carbon fuels include, but are not limited to, biodiesel, cellulosic ethanol, hydrogen, compressed natural gas, liquefied petroleum gas, electricity, and low-carbon blends, such as E10 and E85.

The standard would be measured on a life-cycle basis in order to include all emissions from fuel production to consumption. Options for compliance may include blending or selling increasing amounts of lower-carbon fuels, using previously banked credits, and purchasing credits from fuel providers who earned credits by exceeding the standard.

This option could also promote R&D related to biofuels production, such as the use of enzymes for breaking down cellulose to produce ethanol (as opposed to corn-based ethanol, which has a lower life-cycle benefit).

1.4.2 Low-GHG Fuel for State Fleets (e.g., CNG, Biodiesel)

The state could require public vehicle fleets to include alternative-fuel vehicles (such as those running on compressed natural gas [CNG] and biodiesel), typically targeting a certain percentage of penetration within a certain period of time. These mandates could be used to require pure electric vehicles and/or plug-in electric vehicles for fleets.

1.4.3 Biofuel Expansion (Biodiesel, CNG, LPG, Cellulosic Ethanol)

Arkansas could adopt standards that require a certain amount or percentage of fuel sold within the state to be a renewable 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 renewable fuels by regulating quality standards for fuel blends.

This option could also promote R&D related to biofuels production, such as the use of enzymes for breaking down cellulose to produce ethanol (as opposed to corn-based ethanol, which has a lower life-cycle benefit).

1.4.4 Alternative-Fuel Infrastructure Development

Arkansas could provide incentives to private providers of alternative-fuel infrastructure. The development of an alternative-fuel infrastructure can aid in the promotion of alternative-fuel use. The expense of equipment and installation costs can be offset by creating an alternative-fuel infrastructure. The convenient locations of stations offering alternative fuels at competitive prices can increase the use of the fuel.

1.4.5 Fund R&D for a Full Range of Renewable Transportation Fuels

The state could 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.

1.4.6 Develop Life-Cycle Analyses of Transportation Fuels To Determine the Appropriate Pathways To Sustainably Protect Natural Resources

Arkansas could examine the complete impacts of transportation fuels, looking at the environmental impacts for the full life cycle of the fuel. For example, in examining corn ethanol, the study would look at the environmental impacts of growing the corn, including fertilizers used, emissions from farm equipment, construction and operation of processing facilities, emissions and safety risks from transporting the fuel, and all the way through to the emissions released from burning the fuel versus the energy output of the corn ethanol.

TLU-2. LAND USE AND LOCATION EFFICIENCY**2.1 GENERAL LOCATION EFFICIENCY****2.1.1 Statewide Growth Management Plan**

Arkansas could adopt a statewide growth management plan and corresponding GHG emission goals. The plan would provide specific guidance for regional (metropolitan planning organization (MPO), county, or municipal) transportation and land-use plans and programs to help them conform to the state-determined GHG budgets and vehicle miles traveled (VMT) per capita targets set in the statewide growth management plan.

2.1.2 Include GHG Evaluations in State Policies

The state could require evaluation of the GHG implications of state transportation and land-use legislation, regulations, and policies; capital funding programs; long-range transportation plans; and the project environmental review process. This would help serve as a mechanism to support climate-friendly and energy-efficient policies and development patterns.

2.1.3 Shape Investment to Maximize GHG Reductions

Arkansas could guide public and private land-use development and investment toward maximizing GHG reductions and growth management. This would be accomplished by adoption or strengthening of an Indirect Source Rule to hold development accountable for GHGs, transfer of development rights, open-space protection, coastal zone management, and adequate public facilities initiatives.

2.1.4 Provide Technical and Financial Support to Local Agencies

Arkansas could offer technical and financial support to MPOs, planning offices, and related local/regional agencies for land-use, planning, and zoning activities to provide and enhance technical tools, increase technical capacity, and fund Blueprint Planning Grant programs.

2.1.5 Land Use, Zoning, Tax, and Building Code Reform

The state could modify and fund reforms of state and local property tax, development fees, and zoning/building codes and policies to support GHG reductions and the implementation of state growth management plans. Measures could include revising property tax assessment policies regarding empty or underdeveloped urban lots to encourage infill development; reducing building setback requirements; shifting parking minimum requirements to maximum standards; reducing restrictions on density, floor area ratios, and mixed-use development; and reforming on-street parking availability and pricing.

2.1.6 State Congressional Advocates for Federal Action

Arkansas could pass legislation petitioning state congressional delegations that work for federal highway, transportation, and land-use related legislation/programs to support timely climate change action.

2.1.7 Use of Flexible Federal Transportation Funding

The Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) authorizes \$286 billion in spending between 2004 and 2009 for numerous surface transportation programs, such as highways, transit, freight, safety, and research. Much of this funding is flexible in terms of its utilization by the state, and full funding for transit, pedestrian and bicycle facilities, intercity rail, and other climate-friendly investments should be prioritized.

2.1.8 Downtown Revitalization

The state could provide economic development incentives (e.g., tax-based) and liberalize zoning and permitting processes (parking requirements, density and mixed-use restrictions, etc.) to encourage investment in downtowns and central business districts. Revitalizing downtown areas can reduce automobile travel for commuters and provide sufficient density to support transit operations, thereby providing two means of reducing GHG emissions.

2.1.9 Brownfield Redevelopment

Arkansas could provide economic incentives, liberalized zoning and land use restrictions, and permit streamlining to encourage development of empty or underutilized industrial facilities and derelict properties in urban areas. Redeveloping brownfields in urban areas can be a key factor in urban revitalization, providing new centrally located areas for residential, commercial, or mixed-use development. “Infilling” existing urban areas also reduces average trip distances and can save public funds by taking advantage of existing infrastructure and public utilities.

2.1.10 Traffic Calming

Traffic-calming measures, such as roundabouts, speed bumps, and chokers result in slower-moving, smoother-flowing traffic (e.g., roundabouts reduce full stops at intersections), reduced

GHG emissions, and more attractive areas that are convenient and safe for bicyclists and pedestrians.

2.1.11 Infill Development

The state could provide economic incentives, liberalized zoning and land-use restrictions, and permit streamlining to encourage infill development of vacant or underutilized properties (e.g., surface parking lots) in urban areas already largely developed. Infilling existing urban areas also reduces average trip distances and can save public funds by taking advantage of existing infrastructure and public utilities.

2.1.12 Transit-Oriented Development

Arkansas could provide economic incentives, liberalized zoning and land-use restrictions, and permit streamlining to encourage dense mixed-use development of properties in proximity to transit stations or facilities. Transit-oriented development (TOD) is the creation of compact, mixed-use commercial or residential communities, designed to maximize access to public transit and create a community attractive to pedestrians and bicyclists. TOD is thus a tool that can be used to reduce automobile travel and the associated GHG emissions by increasing travel options and transit ridership.

2.1.13 Smart-Growth Planning, Modeling, and Tools

Arkansas could provide funding, information dissemination, and technical assistance to facilitate the adoption of smart-growth planning processes, models, and tools by local and regional jurisdictions. Smart-growth development reduces sprawl and maximizes environmental, fiscal, and economic resources. This form of planning and modeling often incorporates other planning tools, such as mixed-use, open-space protection, and TOD.

2.1.14 Targeted Open-Space Protection

The state could adopt a comprehensive plan to preserve open space, especially on the periphery of urban areas where sprawl development may otherwise occur. Targeted open space protection typically includes programs or policies designed to protect and conserve state land and recreational and agricultural areas.

2.1.15 Balance Economic Development with Agriculture, Protection of Natural Resources, and Preserving Rural Character

Arkansas could adopt a comprehensive plan to preserve agricultural land uses, protect natural resources, and preserve rural character, especially on the periphery of urban areas where sprawl development may otherwise occur. This type of plan involves considers multiple land uses and policy objectives—including economic development, agriculture, the preservation of natural resources, and the preservation of the rural character of a given area—when examining future development patterns and the economic needs of an area.

2.1.16 Consider the Impact of GHG Emission Reduction Strategies on Public Transportation

The state could provide research and technical assistance to transit agencies and local jurisdictions to evaluate the ridership, revenue, and cost impacts of GHG emission reduction strategies on public transportation services. Many of the strategies considered for reducing GHG emissions involve facilitating the shift of people from personal motor vehicles to other modes of

transportation, for example, discouraging the use of cars and encouraging the use of trains or buses. Many of these strategies involve improving, enhancing, or expanding service and the transportation infrastructure for public transportation, and examining the costs required to accommodate this modal switch and increased farebox revenue.

2.1.17 Research Alternative Ways To Fund Transportation That Creates Incentives To Drive Less

Arkansas could examine alternative funding sources to provide incentives to drive less, taking into consideration federal, state, and local government programs, as well as public-private partnerships and other potential revenue streams. Such sources might include mileage-based inspection fees, increased motor fuel taxes, increased vehicle registration fees, tolls and congestion pricing (including through public-private partnerships), and similar measures.

2.2 INCREASE LOW-GHG TRAVEL OPTIONS

2.2.1 Make Full Use of CMAQ Funds—With Application Reviews Considering GHG Reductions

The state could fully allocate all funding from the federal Congestion Mitigation and Air Quality (CMAQ) program and prioritize its use for GHG-reducing investments.

2.2.2 Improve Transit Service (Frequency, Convenience, and Quality)

Arkansas could increase use of public transit and reduce automobile travel by improving existing transit service (e.g., expanded hours or coverage of bus service, higher-frequency bus routes, investments in rail transit). This option could also include expansion of intercity bus service. Arkansas State Highway and Transportation Department data on travel origins and destinations could help determine whether certain intercity regional routes need prioritization.

2.2.3 Transit Marketing and Promotion (Including Individualized Transit Marketing)

Targeted transit marketing has proved to be highly effective in reducing auto trips through increased transit use. A state subsidy to encourage the adoption of transit passes and/or allow for a reduction in transit fares could be part of this effort.

2.2.4 Bike and Pedestrian Infrastructure

Arkansas could improve, construct, and promote sidewalks and bikeways to increase pedestrian and bicycle travel and reduce automobile use. Bicycle lanes could be provided both on shared streets and on facilities physically separated from roadways, except at crossings. Physical improvements could also include bicycle parking and shower or locker amenities at places of employment. Local government “complete streets” policies could be required, providing for systematic adoption of sidewalks and a network of bicycle lanes, to help achieve these improvements.

2.2.5 Expand Transit Infrastructure (Rail, Bus, Bus Rapid Transit)

Greater use of public transit and reduction in automobile travel can be achieved by expanding public transit infrastructure (e.g., rail lines, bus rapid-transit routes). This option also could include expansion of intercity bus service (e.g., by providing centrally located urban bus

terminals or pickup areas). New transit lines increase the population base served by a transit system, extend system coverage for existing system riders, and expand the overall commercial, residential, and retail markets served. Infrastructure improvements, such as physical track upgrades or the conversion of mixed-traffic lanes to dedicated bus or light-rail lanes, can significantly aid level of service measures.

2.2.6 HOV Lanes

Arkansas could increase funding and identify appropriate locations for additional HOV lanes. HOV lanes can be added by designating new road capacity for HOVs, converting existing lanes, and employing reversible-lane strategies. Although usually in effect only in the peak direction during rush hour, HOV lanes can also be in effect 24 hours. HOV programs are most successful as part of an integrated regional transportation strategy that includes other improvements (e.g., park-and-ride facilities) and incentives for transit and rideshare use.

2.2.7 Enhance Current “Fix it First” Policy

“Fix it First” would prioritize funding for preserving and managing the existing system before funding capital or capacity expansion projects.

2.2.8 Transit Prioritization (Signal Prioritization, HOV Lanes)

The state could improve transit level of service (travel time, reliability and frequency) for urban buses and light rail through prioritization measures, such as signal prioritization (where a transponder on the transit vehicle accelerates or extends the green cycle on traffic lights allowing the vehicle to avoid many red lights), or lane-specific prioritization (preemptively turning a red light green in a lane occupied by a bus or in an appropriate turn lane (thus allowing the bus to merge or turn several seconds in advance of other traffic). Prioritization could also be achieved for buses through HOV lanes, which offer higher travel speeds.

2.2.9 Telecommute, Live-Near-Your-Work, and Compressed Work Week

Arkansas could provide incentives to employers to offer such options as telecommuting, live-near-your-work, and compressed work weeks to reduce automobile commutes. The telecommuting option includes the development and use of neighborhood telecommuting centers that offer office-type services in locations close to commuters’ residences. Live-near-your-work, also known as “proximate commute,” encourages organizations with multiple locations (e.g., banks, fast-food restaurants) to transfer employees, such that the maximum number work at the branch location closest to their homes. A compressed work week (for example, four 10-hour days of work) can reduce the numbers of commute trips at organizations that are able to accommodate this.

2.2.10 Require Government Agencies To Use Telecommuting

State government could be required to offer telecommuting for appropriate employees, which would reduce work trips and set an example for public and private industries.

2.2.11 Car Sharing

Arkansas could provide funding or subsidies, and reserved parking locations, for the introduction or expansion of public or private car-sharing operators. This measure represents the introduction

of hourly rental schemes, usually at discrete locations throughout metropolitan area. These schemes have reduced VMT largely by providing an alternative to car ownership, and have converted fixed vehicle costs (purchase/depreciation, insurance, and parking) to marginal costs. As vehicle owners determine that they can lower their overall transportation costs by disposing of one or more owned vehicles and participating in car sharing, annual VMT for these households can fall significantly.

2.2.12 E-Commerce

The state could provide a sales tax exemption for all e-commerce. Light-duty vehicle trips can be reduced through the use of e-commerce instead of traditional means of shopping involving passenger vehicle travel.

2.2.13 CO₂ Conformity Requirements

Arkansas could allocate transportation CO₂ budgets to local jurisdictions and require them to meet the budget to receive additional state funding. Technical assistance and review would be provided to help in the measurement and monitoring of emissions, as well as the modeling of future emissions to ensure transportation plans conform to the budget. An emission trading system could be permitted between jurisdictions, at a defined market rate for emission permits, because unlike other air pollutants the location of GHG emissions is irrelevant.

2.2.14 Park-and-Ride Lots

Providing additional state funding for park-and-ride lots will expand the construction of well-lit, police-patrolled parking locations for carpoolers and others to interface with buses, light and heavy rail, and commuter trains in the state. This strategy is most effective when implemented jointly with HOV lanes, as well as transit service. While participants still must drive to the lot location, each facility still decreases VMT significantly, especially the portion on the more congested radial commuter routes.

2.2.15 Guaranteed Ride Home

The state could provide funding to transit agencies and local jurisdictions to establish or expand "guaranteed ride home" programs. These programs encourage carpooling and transit use by providing a back-up means to return home. Generally, this is aimed at people concerned that without their own private vehicle at work, they will not have transportation in case of unexpected overtime, early departures for family sickness or emergencies and similar situations. A limited number of times annually participants are eligible for alternative transportation, including taxi fare where appropriate, to provide this back-up transportation.

2.2.16 Telecommuting Center Support and Incentives

Arkansas could offer funding and incentives for regional telecommute centers, which provide an office-type environment where telecommuting employees can receive various levels of logistical support. Employees can avoid having to create their own home work space and the distractions that sometimes correspond, employers can know their employees are in an office setting, and the facilities significantly decrease vehicle commute mileage.

2.2.17 Adopt Best Work Places for Commuters Policies

Arkansas could adopt for state employees and provide incentives to other organizations to adopt the policies and programs as set forth by the U.S. Environmental Protection Agency's (EPA's) Best Work Places Program to reduce VMT associated with daily work commutes. For more information, please visit: <http://www.bestworkplaces.org>.

2.2.18 Issue Free Bus Passes to Downtown Workers

The state could provide funding to transit agencies for free bus passes for people who work in congested downtown areas. Transit pass programs allow discounted or unlimited rides within a given time period or number of rides. This measure increases ridership by price-sensitive customers (e.g., students), significantly helps replace personal vehicle trips with transit trips, and represent a no-cost mode shift to transit.

2.2.19 Issue Free Bus Passes to Students and Retired People

Arkansas could provide funding to transit agencies for free bus passes for students and retired persons. Transit pass programs allow discounted or unlimited rides within a given time period or number of rides. This measure increases ridership by price-sensitive customers (e.g., students), significantly helps replace personal vehicle trips with transit trips, and represent a no-cost mode shift to transit.

2.2.20 Create Regional Intermodal Transportation Centers

Funding could be provided for intermodal terminals in centralized location(s) where various forms of passenger transportation connect to one another, such as rail, bus, and bikeways. The intermodal centers can significantly improve the level of service for users by facilitating easier transfers, which can be established with coordinated schedules minimizing transfer wait times. Transfer timing/coordination improvements can be made through both improving and publicizing better connections between bus and/or rail services. The high value that travelers place on waiting time makes these improvements especially effective.

2.2.21 Vanpooling and Carpooling

Financial incentives or preferential treatment could be provided for vanpools and carpools and supporting regional ride-matching programs could be funded. These options reduce VMT associated with workplace commuting, as well as rush-hour traffic congestion and the GHG emissions associated with traffic. Regional ride-matching programs provide a centralized database for matching drivers with others with similar commuting schedules, origins, and destinations. Because of registration requirements, participant identities are known, thus allaying safety concerns.

2.2.22 Pricing Strategies

Arkansas could implement a range of pricing strategies to encourage modal shifts and to reduce congestion, which reduces fuel economy. Pricing strategies may include options such as the development of High Occupancy Toll (HOT) facilities (allowing vehicles to pay a toll to use an HOV lane), cordon or area pricing (as has been implemented in London) and using congestion pricing for heavily congested expressways and downtown locations.

2.3 INCENTIVE AND DISINCENTIVES

2.3.1 Commuter Choice Programs/Parking Cash-Out

The state could provide incentives, such as a tax credit, to encourage employers to offer Commuter Choice Programs that provide option for reducing automobile commutes, such as telecommuting, transit subsidies, pre-tax transit fare program, parking cash-out, and guaranteed ride home service. Parking cash-out is a federal tax programs that allows employees to receive a cash payment as an alternative to receiving employer-paid parking. Transit benefits are a parking cash-out variant that allows employees to receive a tax-exempt payment valid on local transit systems. These programs can also provide a ride-matching service solely within the employer's workforce, arrange and/or subsidize vanpools, and provide preferential parking and other amenities to carpoolers or others who do not drive alone to work. The telecommuting option includes the development and use of neighborhood telecommuting centers that offer office-type services in locations close to commuters' residences. Government spending to encourage commuter choice can stimulate a large private-sector match.

2.3.2 VMT Tax

The state could charge a tax or fee reflective of passenger VMT. It would be collected through odometer audits at annual vehicle inspection visits or through GPS or similar systems as they become increasingly commonplace. In many cases, it has been proposed that the fee be revenue-neutral, offsetting fuel tax revenue that is on a trajectory to otherwise decline with improving fuel economy and increased use of untaxed alternative fuels. As an alternative, revenues could be increased somewhat and used to fund transit and other transportation alternatives within a corridor or region.

2.3.3 Pay-As-You-Drive Insurance

The state could pass necessary legislation to encourage and support the provision of pay-as-you-drive auto insurance, possibly including state support for additional pilot programs. This measure converts vehicle insurance from a relatively fixed annual rate (which varies little by mileage), to a mostly mileage-based rate. Thus, instead of paying \$480, \$600, or \$720 annually, depending on a person's actuarial bracket, that person would pay \$.04, \$.05 or \$.06 per mile (based on the national average of 12,000 annual miles), plus perhaps a fixed amount to reflect theft or certain other largely mileage-independent risks. This measure has been shown to be a more accurate and equitable reflection of actual risks, and has already been adopted as an insurance option in several states.

2.3.4 Increased Fuel Tax (With Targeted Use of Revenue Toward Travel Alternatives)

Arkansas could increase the state tax on conventional fuels and dedicate revenues to fund transit and other transportation alternatives within a corridor or region.

2.3.5 Location-Efficient Mortgages

Arkansas could pass legislation permitting location-efficient mortgages and encourage and support their implementation. In this program mortgage providers establish a lending program

that reflects the transportation cost savings of living near transportation-oriented developments (from not owning or frequently using a car) in what potential homeowners can borrow.

2.3.6 Congestion Pricing (With Targeted Use of Revenue Toward Travel Alternatives)

Introduction of tolls and road pricing that varies with congestion levels (congestion pricing) can be particularly effective at reducing congestion and thus significantly improving vehicle fuel economy, in addition to reducing VMT. Roadway pricing revenues can help fund needed highway improvements, can help manage system-wide demand, and can be used to fund transit and other transportation alternatives within a corridor or region.

2.3.7 Parking Pricing, Excise Tax, and/or Supply Restrictions

Arkansas could establish state standards with incentives for local adoption of parking management strategies. Automobile use is strongly influenced by the location, supply, and pricing of parking. Local governments can encourage reduction in automobile use by eliminating minimum parking supply requirements, establishing parking supply caps, encouraging higher parking prices, and other mechanisms. Parking ratios for the maximum number of spaces allowed can be set based on the level of transit service an area has. "Smart" parking identification systems can help inform drivers of parking availability and reduce excessive circling and searching.

2.3.8 Free Downtown Parking for Carpoolers

Incentives for carpooling and disincentives for single-occupancy vehicles could be created by providing free downtown parking for carpoolers at municipal lots, issuing vouchers to carpoolers, or offering a subsidy to private parking operators to offer free parking to carpoolers.

2.3.9 Transit Market Repositioning

The state could fund enhanced promotion and marketing of transit to increase use of public transit and reduce automobile travel. A state subsidy to encourage the adoption of transit passes and/or allow for a reduction in transit fares could be part of this program.). Though reducing fares is an important means to increase transit ridership, it is neither the only nor necessarily the most cost-effective means of increasing ridership. Targeted transit marketing has proved to be highly effective in reducing auto trips through increased transit use.

2.3.10 Transit Pricing Incentives

Providing a subsidy to transit agencies to reduce their fares would include various incentives that give discretionary travelers reasons to choose transit. This could include reduced fares (for populations, such as seniors, or time-based fares, such as travel during off-peak hours). Though reducing fares is an important means to increase transit ridership, it is neither the only nor necessarily the most cost-effective means of increasing ridership.

2.3.11 VMT/GHG Offset Requirements for Large Developments

Arkansas could require the identification of GHG emissions and mitigation measures as part of the environmental review process for large developments. In all levels of environmental review, the state could require an inventory of the changes in GHG emissions that will result from the

project or plan, and identification of strategies that will be undertaken to offset all net new emissions or to help meet state or regional emission goals. Offsets could include, for example, preserving open spaces and converting to alternative-fuel energy sources. Additionally, mitigation requirements could involve the use of a one-to-one VMT reduction measure, whereby developers would be required to invest in strategies that would reduce VMT by the amount expected to be created by the new development.

2.3.12 Benefits for Low-GHG Vehicles (Preferential Parking, Use of HOV Lanes)

Drivers of vehicles with low GHG emissions—both vehicles using alternative fuels and those with high fuel economy—could be provided incentives, such as preferential vehicle access to metered parking spaces or HOV lanes.

2.3.13 Reserved Parking Spaces for High-Occupancy Vehicles and Car-Share Programs

The state could set standards for local jurisdictions to provide incentives for HOVs and car-share programs, such as reserved parking spaces.

2.3.14 Cordon Pricing

London, Stockholm, Singapore and several Norwegian cities have implemented cordon pricing (area pricing), and San Francisco is likely to follow suit. Cordon pricing involves the implementation of a toll to drive within central urban areas, using electronic, camera, or similar toll-collection technology to avoid the need for toll booths.

2.3.15 Encourage Arkansas Colleges To Restrict Student Driving by Limiting Student Parking on Campus

Some U.S. colleges restrict student driving by prohibiting some or all undergraduates from parking or using cars on the campus. Typically, some or all undergraduates must store their cars in a distant lot until needed for out-of-town travel. Besides reducing GHGs directly, this policy encourages young people to develop car-free habits, encourages alternative transportation (walking, bicycles, mass transit) and compact development near college campuses, saves money and space for on-campus parking, and reduces automobile deaths and injuries.

2.3.16 Encourage Arkansas Secondary Schools To Restrict Student Driving by Initiating Restrictive Policies for Student Parking

Besides reducing GHGs directly, this policy encourages young people to develop car-free habits, encourages alternative transportation (walking, bicycles, mass transit), saves money and space for on-campus parking, and reduces automobile deaths and injuries.

2.3.17 Free Downtown Parking for Fuel-Efficient Vehicles

Municipalities can encourage the use of more fuel-efficient vehicles by providing free parking in downtown areas for vehicles with a fuel economy of greater than 40 miles per gallon, for instance.

TLU-3. HEAVY-DUTY VEHICLES

3.1 HEAVY-DUTY-VEHICLE TECHNOLOGIES

3.1.1 Vehicle Technology Improvements (e.g., Aerodynamics)

The fuel efficiency of freight trucks can be improved using a variety of equipment modifications (e.g., aerodynamic devices on both the tractor and the trailer, speed governors, wide-base tires, fuel-efficient lubricants, low-rolling-resistance radial tires, automatic tire-inflation devices). Government agencies can promote truck fuel efficiency improvements with financial incentives for equipment modifications.

3.1.2 R&D on Low-GHG Vehicle Technology

The state could support R&D of low-GHG heavy-duty vehicle technology to encourage technological innovation in the field.

3.1.3 Black Carbon Control Technologies (e.g., Use of Particulate Traps, Other Complementary Technologies)

Diesel particulate matter includes black carbon aerosols, which are thought to contribute to global warming through positive radiative forcing. Diesel particulate emissions can be reduced through the use of several types of exhaust retrofit devices and particulate traps.

3.1.4 Facilitate Adoption of New Clean Technologies—Rail and Marine Engines

EPA has proposed new criteria air pollutant emission standards for locomotive engines and commercial marine vessel diesel engines. Steps or incentives might be taken to introduce these technologies to the marketplace earlier than the federal requirements.

3.1.5 Single-Wide Tires, Low-Resistance Radials, Automatic Tire Inflation

Government agencies can provide incentives for using energy-efficient truck tires or technologies to improve the fuel economy of trucks. These strategies include the use of single-wide tires, low-rolling-resistance radials, and automatic tire-inflation equipment.

Single-wide (rather than double-wide) tires improve fuel economy by reducing rolling resistance for vehicles. In addition, tires specifically designed as low-rolling-resistance tires are often provided as original equipment on new vehicles. However, consumers often don't choose these tires for replacement tires because of their increased cost, despite their long-term cost savings through fuel economy improvements. In addition, the proper inflation of tires can have a significant impact on a truck's fuel efficiency. Automatic tire inflation equipment helps maintain the optimum tire pressure.

Because each of these strategies eventually pays for itself (by reducing fuel consumption), a loan program for small operators or trucking owner-operators can be beneficial. An awareness campaign can also be conducted, in conjunction with EPA's SmartWay program, to encourage truck operators to consider these tires and technologies.

3.2 HEAVY-DUTY-VEHICLE OPERATIONS

3.2.1 Freight Logistics Improvements/GIS

Some inefficiencies in trucking operations increase fuel consumption, such as excessive idling, using longer or more congested routes, and hauling empty trailers. Improving freight logistics, through geographic information system (GIS) technology and other tools, can help with load matching and route and schedule optimization.

3.2.2 Enforce Speed Limits

Reducing the number of trucks traveling over the speed limit can improve the fuel economy and safety of these truck, and reduce GHG emissions. Speed cameras, both for intercity highways and urban roads, have proven to be an effective and cost-effective means for enforcing speed limits. In addition, it may be possible to lower the speed limit on interstates, freeways, and major arterials to improve the fuel efficiency of vehicles. However, reducing speed limits on roads designed to support higher speeds may require significant enforcement.

3.2.3 Improve Traffic Flow

Improving traffic flow can reduce fuel use by and GHG emissions from all vehicles. Coordinated operation of the regional transportation network, such as through the use of freeway ramp metering, can improve system efficiency, reliability, and safety.

3.2.4 Increased Size and Weight of Trucks

Larger trucks may take advantage of economies of scale to haul more freight with a proportionally smaller increase in fuel consumption. Therefore, the state could consider changing state truck size and weight regulations. However, several issues would have to be considered before changing truck size and weight regulations. First, this action could induce some shipments to shift from rail to trucking, possibly increasing net GHG emissions. In addition, increasing regulations on the size and weight of trucks also raises safety concerns, and may increase road maintenance needs, among other issues.

3.2.5 Pre-Clearance at Scale Houses

Truck queuing and idling time can be reduced through pre-clearance at highway truck weigh stations and expanded use of weigh-in-motion systems.

3.2.6 Truck Stop Electrification

Truck emissions can be reduced by providing electrification at truck stops to reduce idling. These electrical hook-ups can provide power for heating, cooling, and other needs while trucks are stopped. This could be particularly beneficial at overnight rest stops.

3.2.7 Enforce Anti-Idling Ordinances/Encourage Idling Alternatives

Vehicle idling can be reduced by enforcing anti-idling ordinances and/or encouraging the use of alternatives to idling. Many states and local governments have adopted idling regulations for trucks and buses. Alternatives to long-term truck idling include the use of such technologies as

automatic engine shut-down/start-up system controls, direct-fired heaters, auxiliary power units, and truck stop electrification.

3.2.8 Clean Freight Operating Improvements

The state could require or enforce the covering of rail cars. For example, uncovered coal trains result in fugitive coal dust emissions. The state could also consider ways to improve truck operations to reduce associated particulate (black carbon) emissions. For example, ports could maximize the implementation of “paperless gates,” such as through the use of a Web-based booking system to prevent gate congestion and idling.

3.2.9 Freight Villages/Consolidation Centers

The state could provide economic incentives and siting assistance for the development of freight consolidation centers, which can reduce the number of truck trips by combining the loads of multiple underutilized trucks. When paired with intermodal rail yards, these centers can also help make rail freight transportation (which produces fewer GHGs than trucking) more attractive.

3.3 INCREASING LOW-GHG HEAVY-DUTY TRANSPORTATION OPTIONS

3.3.1 Intermodal Freight Initiatives

This option focuses on strategies to encourage more use of freight rail, for example through improvements in railroad infrastructure and rail yards. In many cases, carrying freight by rail rather than trucks can reduce emissions and fuel consumption, while also reducing congestion on major roadways. Shifting freight from trucks to rail also decreases impacts on highway infrastructure, and may reduce truck-related idling and GHG emissions and particulate matter.

3.3.2 Feeder Barge Container Service

Container shipping was originally intended to serve state-to-state shipping. Marine container shipping is often assumed to be too slow for domestic freight, but Europe has seen high growth rates in water-borne (especially river) container freight over relatively short distances. This option would support policies and infrastructure investment to shift more freight back to marine shipments.

3.3.3 Increase Rail Capacity and Address Rail Freight System Bottlenecks

Increasing rail capacity may allow some freight to shift from trucks to rail. In addition, rail infrastructure improvements could enable more use of the more fuel-efficient double-stack rail cars.

3.3.4 Shift Freight Movements From Truck to Rail

The state could provide economic assistance and regulatory streamlining for the improvement of intermodal rail yards and the relief of rail freight bottlenecks. Moving freight by rail is much more fuel efficient than by truck. Moving freight from highways to rail would also relieve congestion on highways, improving the fuel economy of remaining vehicles.

3.3.5 Promote Strategies To Ease the Movement of Freight in More GHG-Efficient Ways

The state could provide economic assistance and regulatory streamlining for the improvement of intermodal rail yards, relief of rail freight bottlenecks, and encouragement of short sea (coastal) shipping. It could also provide technical assistance to and promote the awareness of freight users of the environmental benefits of adjusting their supply chain toward more GHG-efficient modes (rail, marine, and pipeline).

3.4 HEAVY-DUTY-VEHICLE INCENTIVES AND DISINCENTIVES**3.4.1 Procurement of Efficient Fleet Vehicles (Public, Private, or Other)**

This option would provide incentives or discounts to fleet operators for the purchase of more fuel-efficient heavy vehicles. It would also provide education and encouragement for “right-sizing” fleet vehicles—i.e., purchasing the most fuel-efficient vehicle for freight needs.

3.4.2 Incentives To Retire or Improve Older, Less-Efficient Vehicles

GHG emissions can be reduced from heavy-duty diesel vehicles by developing and implementing an incentives program to accelerate the replacement and/or retirement of the highest-emitting diesel vehicles. Starting with the 2007 model year, stringent new federal emission standards for new heavy-duty diesel vehicles take effect. In addition, the fuel efficiency of vehicles declines over time due to wear and tear. Incentives can be offered to the owners of older vehicles to retire their vehicles early and replace them with vehicles meeting the 2007 emission standards.

3.4.3 Maintenance and Driver Training

Better driver information and education can lead to improvements in fuel efficiency. Drivers need to be aware of maintenance issues that cause an increase in pollution and heavy-vehicle operating costs. In addition, driver education programs can encourage energy-efficient driving habits, such as speed control and reductions in idling.

3.4.4 Increased Emission-Based Truck Tolls or Highway User Fees

Emission-based truck tolls and/or highway user fees can help reduce congestion and thereby reduce GHG emissions. In addition, roadway tolling can be used to provide revenue for construction or operation of more energy-efficient modes of transportation (e.g., rail improvements).

TLU-4. INTERCITY PASSENGER TRAVEL: AVIATION, HIGH-SPEED RAIL, BUS**4.1 High-Speed Rail**

Arkansas could 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. Additional financial assistance could be provided to improve services already provided by Amtrak on other routes. This would allow for the more energy-efficient movement of people,

reducing GHG emissions associated with aircraft activity and highway travel while eliminating congestion for those traveling on the highway.

4.2 Integrated Aviation, Rail, Bus Networks (Planning, Governance, and Investment)

The state could encourage transportation infrastructure between cities to support connectivity of alternative transportation modes. Intermodal passenger terminals shared between bus, rail, transit and possibly airports can facilitate shifts away from personal vehicles.

4.3 Aircraft Emissions

Increasing the operational efficiency of aircraft reduces GHG emissions. Incentives or subsidies can be provided to accelerate implementation of a number of air traffic control innovations that are well under development (reduced vertical separation minimums, CNS/ATM [communication, navigation, surveillance/air traffic management], continuous descent landings) at state airports. Other improvements can include reduced aircraft engine idle time at the gate and on the runway, R&D of emission-reducing technologies for aircraft, and the use of ground tractors to pull aircraft the full distance from the gate to the taxiway (rather than inefficiently using the aircraft's engines for this purpose (already implemented by Virgin Atlantic).

4.4 Airport Ground Equipment

Improving runway management and ground support equipment reduces airport emissions. This may include use of auxiliary power units and alternative fuels and electrification of gates.

4.5 Intercity Bus Incentives and Subsidies

The state could offer incentives to potential passengers and provide loans and/or subsidies to operators (public or private) to provide improved and less expensive intercity bus service.

4.6 Intercity Passenger Rail

Financing, regulatory relief, and the use of eminent domain could be provided to develop, publicly or privately, a high-speed intercity passenger rail system serving major urban areas. Additional financial assistance to improve services already provided by Amtrak on other routes could also be provided. This would allow for the more energy-efficient movement of people, reducing GHG emissions associated with highway travel while eliminating congestion for those traveling on the highway.

TLU-5. OFF-ROAD VEHICLES (CONSTRUCTION EQUIPMENT, OUTBOARD MOTORS, ATVS, ETC.)

5.1 Incentives for Purchase of Efficient Vehicles and Equipment

The state could adopt a variety of programs to increase purchase of fuel-efficient or low-GHG vehicles (including pure electric, hybrid, plug-in hybrid, and other alternative-fuel vehicles). State incentives could include registration fees, feebates, and/or tax credits. Feebates would provide incentives for reduced GHG emissions by creating (1) fees on relatively high-emission/lower-fuel-economy vehicles and (2) rebates or tax credits on low-emission/higher-fuel-economy vehicles. Higher vehicle registration fees could be charged for vehicles that have lower fuel economy, or vehicles that use alternative fuels could be charged a lower fee. Vehicle licensing fees could be based on vehicle weight, with use of a dollar-per-vehicle-ton multiplier instead of the present broad categories of vehicle weight.

5.2 Improved Operations, Operator Training

Better operations information and education can lead to a gain in fuel efficiency. Operators also need to be aware of maintenance issues that cause an increase in pollution and vehicle operating cost.

5.3 Maintenance Improvements

Proper vehicle maintenance can result in fuel efficiency and lower emissions.

5.4 Increased Use of Alternative Fuels or Low-Sulfur Diesel

Arkansas could increase the availability, accessibility, and use of alternative fuels and low-sulfur diesel for off-road vehicles by adopting a low-GHG fuel standard, for example.

5.5 Adopt Green Port Strategy (Port Land-Side: Clean Up Port-Dwelling and Cargo-Handling Equipment Operations)

The state could adopt port measures to encourage more energy-efficient technologies for vessel dwelling (plug-in technology, vehicle retrofits, etc.) and for land-side cargo-handling equipment (clean truck fees, low-sulfur vehicles, etc.).

5.6 Low-Carbon Fuel (Off-Road and Recreational Marine)

Arkansas could expand low-carbon fuel use to off-road and recreational marine vehicles, and provide incentives and support for the development of low-carbon fuel infrastructure.

5.7 Locomotive Idling Reductions

Reduced locomotive idling, including auxiliary engines, would help maintain power, along with plug-in power receptacles in the proposed train storage yards.

5.8 Inclusion of Idling Reduction Requirements

Construction contracts could include clauses in that would restrict idling time for construction equipment.

5.9 Diesel Cranes at the Port—Electrification or Other GHG-Reducing Alternatives

Clean diesel cranes could be encouraged at ports, and electrification or other methods to reduce GHG emissions could be considered.

5.10 “Shore Power” at Port Sites

Plug-in power could be provided at port sites to enable vessels to turn off engines and reduce idling. Capital costs can be offset in part by federal grant funds (e.g., EPA \$50,000 grant to Seattle City Light for Port of Seattle Shore Power).

5.11 Regulate Outboard Motor Boat and Lawn Mower Gasoline Engines

Outboard motor boat and lawn mower gasoline engines could be regulated to reduce their GHG emissions.