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## Transportation and Land Use (TLU) Technical Work Group

### Summary List of Pending Priority Policy Options for Analysis

| No.    | Policy Recommendation   | GHG Reductions (MMtCO <sub>2</sub> e) |      |                 | Net Present Value (Million \$) | Cost-Effectiveness (\$/tCO <sub>2</sub> e) | Level of Support |
|--------|---|---------------------------------------|------|-----------------|--------------------------------|--|------------------|
|        |   | 2020                                  | 2030 | Total 2010–2030 |                                |  |                  |
| TLU-1  | Bike and Pedestrian Comprehensive Plan and Infrastructure Development   | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-2  | Livability, Brownfield Redevelopment, Downtown Revitalization, and Location-Efficient Strategies                        | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-3A | Transportation System Management  | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-3B | Transit Management  | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-4  | Expand Transit Infrastructure (Rail, Bus, Bus Rapid Transit)  | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-5  | Education and Outreach for Vehicle Maintenance, Idle Reduction, and Co-Driving, and Promote Alternative Modes of Travel | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-6  | Land Use, Zoning, Tax, and Building Code Reform, and Connectivity   | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-7  | Parking Management and Ride Sharing   | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-8  | Strategies to Move Freight in More GHG-Efficient Ways   | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-9  | Promote Consumption of Locally Produced Goods and Services  | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-10 | Promote the Use of Alternative Fuels  | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |
| TLU-11 | Promote the Use of Clean Vehicles   | <i>Not Yet Quantified</i>             |      |                 |                                |  | <i>Pending</i>   |

GHG = greenhouse gas; MMtCO<sub>2</sub>e = million metric tons of carbon dioxide equivalent; \$/tCO<sub>2</sub>e = dollars per metric ton of carbon dioxide equivalent.

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. Bike and Pedestrian Comprehensive Plan and Infrastructure Development

### Policy Description

This policy would improve, construct, and promote sidewalks and bikeways to increase pedestrian and bicycle travel and reduce automobile use.

### Routes and Elements of the Plan

Not so many years ago, most urban and suburban communities had sidewalks and many low-volume, low-speed roads. Many rural communities had few sidewalks, but traffic was sparse and moved at lower speeds than today. Increases in population and automobile use have resulted in complex transportation systems that accommodate more traffic. Motorized traffic has been accommodated without always considering the needs of non-drivers. In response to a growing interest in walking and bicycling, planners and engineers have developed guidance to improve conditions. Bicycle and pedestrian planning should be guided by the following principles.

*Principle #1: Local bicycle and pedestrian systems should provide safe and comfortable facilities.*

Research has contributed to our understanding of the needs of bicyclists and pedestrians. For instance, there is unequivocal evidence that sidewalks protect pedestrians and contribute to overall traffic safety. Other research indicates that bicycle lanes increase the safety of bicyclists on roadways between intersections and enhance a bicyclist's sense of comfort in traffic. Research is inconclusive as to whether bicycle lanes help or complicate movements at intersections. Careful design judgment is required for the best application of many bicycle and pedestrian improvements.

There are many ways to increase the perception of safety. For example, attractive surroundings are more welcoming to pedestrians and bicyclists. Tree-lined streets with minimum traffic, traveling at low speeds, and well-maintained roads and sidewalks invite bicycling and walking. Buildings in good condition also increase an individual's sense of comfort and safety in a neighborhood. Higher-density environments that provide sidewalks and short distances between residential and commercial areas also encourage walking.

Areas that are inherently unfriendly to bicyclists and pedestrians can be improved with practical design treatments. For example, the safety and comfort of pedestrians and bicyclists can be improved at multi-lane crosswalks, with the addition of refuge islands and recessed stop lines. Furthermore, the addition of landscaping may also increase a person's sense of comfort and safety.

*Principle #2: Direct access to destinations and continuity through connected facilities encourage the use of bicycle and pedestrian facilities.*

Efforts should be made to connect local facilities with adjacent communities and state and regional trails. Pedestrians need a continuous system of sidewalks and crossing opportunities that connect residential areas to schools, jobs, shopping, and other services. There should be a pro-

active approach by government that will require sidewalks in new developments and in-fill of missing sidewalk links.

Bicyclists are also dependent on continuity, especially if bicycles are used for transportation. A broad range of improvements can accommodate bicycling, including the signing and re-stripping of existing roadways, as well as, building off-road trails. The most efficient bicycle plans accommodate the highest-priority destinations of local cyclists through connected facilities.

Access can further be improved by considering pedestrians and bicyclists in site design and transit planning. Walkways to and within large developments and shelters for transit users provide convenience and comfort for pedestrians. “Bikes-on-buses” programs increase the efficiency of public transit. Bicycle parking should be available at transit stations, shopping areas, schools, libraries, and parks.

*Principle #3: The design and extent of a bicycle and pedestrian system should reflect the needs of the community.*

Communities differ in the type of bicycle and pedestrian facilities they require. The character of a community, its existing infrastructure and the needs of local bicyclists and pedestrians determine the opportunities and constraints that define a reasonable approach to planning. Rural communities that are characterized by relatively narrow roads with shoulders, limited public land holdings, and long distances between farms and towns are quite different from urban areas with high traffic volumes, curbed streets, and compact land uses. University and college towns, as well, have special needs.

Opportunities for off-road trail facilities also vary by community location and type. Suburban communities often fare well, especially if they have actively planned for open-space preservation along rivers and abandoned railroad rights of way. They can develop inter-urban trails, create local bikeway networks, and include sidewalks in new development.

Opportunities to create linear trails in urban areas are sometimes constrained by dense land use and intense development pressure. However, in many cities, river walks and railroad corridors have been developed as important public spaces. Cities usually have the advantage of a grid street pattern and a relatively complete sidewalk system that offers alternatives for bicycle travel and places to walk.

Rural areas gain multiple benefits when shoulders of roadways are paved for bicyclists and town centers are designed to be pedestrian friendly. A correlation exists between high levels of bicycling and walking and the presence of a college or university. Educational institutions should always be included in a community’s non-motorized planning efforts.

*Principle #4: A bicycle and pedestrian plan should be implemented in phases over a reasonable period of time.*

The development of a bicycle system network and pedestrian circulation system will be determined, in part, by input from the public, the configuration of the existing infrastructure and linear corridors, and availability of funding. It is important to select popular initial projects that can be readily implemented. In addition, early projects should include low-cost items that will

make a difference to the community. Subsequent projects will include those that require more coordination and a longer funding horizon.

It is advantageous to secure local funding from a variety of sources. Demonstrating that a plan can be executed through a combination of already-planned transportation projects, various grant programs, and local volunteer efforts builds support for allocating needed matching funds and accessing local budgets.

### **Policy Design**

Bicyclists want access to most of the same places as motorists, and they can legally use any roads from which they are not officially banned. Many roads are usable for local bicycling, but others are undesirable because of such factors as excessive traffic and high speeds. Bicyclists have varying levels of comfort in traffic, depending on skill levels and aversion to risk. The average adult bicyclist is uncomfortable in heavy, fast traffic and prefers an improved designated bicycle facility system.

Pedestrian planning differs from bicycle planning partly because almost everyone walks. Individuals from every age group and ability level use the pedestrian environment, and most destinations need to be accessible by walking. People may be walking less these days, especially in environments that lack pedestrian accommodations. However, many communities are attempting to reverse this trend since walking is healthful, brings people in contact with their neighbors, and offers mobility to those who cannot or choose not to drive.

A bicycle- and pedestrian-friendly community must provide facilities that allow people to bicycle and walk safely. In some circumstances, roadways and developments must be retrofitted to make bicycling and walking easier and more inviting. Facilities alone will not encourage a change in behavior. Revitalizing downtowns and planning for density and mixed-use development are equally important.

### **Goals:**

1. To increase walking and bicycling by making it a fun, comfortable and accessible mode of travel.
  - a. 10% of all trips by walking and 2% of all trips by bicycle by 2020.
  - b. 13% of all trips by walking and 3% of all trips by bicycle by 2030.
  - c. Walking and bicycling account for 1% of person miles traveled by 2020, and 1.5% by 2030.
2. To simultaneously reduce the number of cyclists killed and injured in crashes with motor vehicles.
  - a. Reduce the rate of pedestrian and bicycle crashes by  $\frac{1}{4}$  by 2020.
  - b. Reduce the rate of pedestrian and bicycle crashes by  $\frac{1}{2}$  by 2030.

**Timing:** See the Goals section, above.

**Parties Involved:** State government agencies, such as numerous Departments of the Kentucky Transportation Cabinet (KYTC), local community pedestrian/bicycle program managers, and educational institutions.

**Other:** None.

**Implementation Mechanisms**

**Related Policies/Programs in Place**

**Type(s) of GHG Reductions**

**Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

**Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

## TLU-2. Livability, Brownfield Redevelopment, Downtown Revitalization, and Location-Efficient Strategies

### Policy Description

The policies described in this section will align growth and/or development in Kentucky with greenhouse gas (GHG) reduction goals. “Livability” means different things to different people. For folks wanting to be less dependent on an automobile (such as senior citizens or one-car or no-car families), it may define a community with affordable housing where schools, shopping, entertainment, and other services are accessible by walking, or biking, or taking transit. For others, it may be a community with easy access to parks and recreation. For still others, it may be a community with lots of different social and recreational options. “Sustainability” is the capacity to endure and most usually refers to being supportive of environmental goals. Clearly, we want our livable communities to be sustainable as well.

The U.S. Department of Transportation (DOT) has described livable, sustainable communities as places where transportation, housing, and commercial development investments are coordinated to better serve the people living in those communities. Such communities can be called “complete communities.” Developing statewide policies to foster complete communities will have significant economic, social, and ecological benefits for communities across Kentucky. This bundle of policies includes the following elements:

- Transit-oriented development (TOD).
- Livability planning, modeling, and tools.
- Bicycle and pedestrian infrastructure.
- Growth management planning.
- Downtown revitalization, including infill and brownfield redevelopment.
- Technical and (possible) financial support to local and regional agencies.
- Reforms of local zoning, tax, and building codes.

Policies and strategies that affect land use and transportation patterns are proven to reduce vehicle miles traveled (VMT). Implementation of such policies and strategies will enable more Kentuckians to conveniently travel on foot, by bicycle, by transit, or with shorter driving trips. Improving the availability of planning tools and other resources will enable implementation. The combination of these policies and strategies will ensure maximum impact. Achieving reductions in VMT through livability policies and strategies will occur through:

- *Education and Technical Assistance*—Communities will be given flexibility and choices to achieve VMT reduction goals through their ideal growth and development. Local governments and other stakeholders, such as developers and private lending institutions, will be provided technical assistance that will include diverse strategies for communities to consider using in reaching their VMT reduction goals (e.g., model zoning code provisions, local tax code reform to achieve smart growth, etc.). Education will be provided to parties involved with implementation, as well as to the general public in order to overcome barriers

to accepting livability principles and to encourage sustainable lifestyles like biking and walking.

- *Incentives and Funding Programs*—Existing incentives, funding, and loan programs administered by the state that are applicable to growth and development will be assessed and realigned to support the elements of this livability bundle of policies. Rating systems and prioritization of funding will be reviewed and improved to meet livability/sustainability objectives. New programs will be developed and existing programs will be revised to fill in gaps where no program exists to meet needs that cannot be achieved, or are far less likely to be achieved, without funding assistance (e.g., improved brownfields and greyfields incentives, increased technical assistance funding).

Details of specific policies and programs that fall under the above categories will be outlined in the Implementation Mechanisms section of this policy option document.

## Policy Design

### Goals:

- More compact urban development and mixed use development—50 new projects by 2030
- Pedestrian-friendly development.
- Urban infill development.
- More local governments to adopt site planning and urban design standards that help reduce VMT and GHG emissions.

**Timing:** See Goals section, above.

**Parties Involved:** Local governments, developers, private lending institutions, KYTC, Kentucky Cabinet for Economic Development, Kentucky Cabinet for Economic Development, Kentucky Department for Environmental Protection (DEP), High Performance Buildings Advisory Committee, Kentucky Finance and Administration Cabinet, Kentucky Board of Education, Federal Highway Administration (FHWA)—Kentucky Division.

**Other:** None.

## Implementation Mechanisms

## Related Policies/Programs in Place

## Type(s) of GHG Reductions

## Estimated GHG Reductions and Net Costs or Cost Savings

### Data Sources:

**Quantification Methods:**

**Key Assumptions:**

**Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

## TLU-3A. Transportation System Management

### Policy Description

Transportation system management (TSM) is the concept of pairing transportation demand with transportation supply to help transportation networks serve the demand effectively and efficiently. Effective system management and operation may utilize a variety of strategies based on advanced technologies, market-based incentives, regulations, and design standards. TSM strategies are relatively low in cost but effective in nature. Each strategy alone provides a relative small benefit to GHG reduction, but when applied in concert, substantial gains can be achieved.

TSM strategies attempt to reduce the number of trips being taken by single-occupant vehicles (SOVs), shorten trip lengths, reduce delay, increase reliability of the network, and reduce idling (and/or other transportation actions that result in increased GHG emissions). The goal of TSM is to reduce the daily VMT per capita on the transportation network. An added benefit of effective TSM is reduced vehicle hours traveled (VHT) per capita, which measures the amount of traffic congestion delay. Reduction in VMT or VHT is highly correlated with reduced GHG emissions. Additional benefits include enhanced freight movement, accessibility, and safety.

TSM attempts to both improve transportation system performance and alter travel behavior through a combination of technological improvements, incentives, design, and restrictions. Technological improvements include traffic signal coordination, traveler information displays, lane management, real-time monitoring of traffic conditions to adapt/improve operations, and other intelligent transportation system (ITS) applications. Incentives can include policies that financially favor desired behavior or allow users to gain a time advantage and include value pricing and smart parking strategies. System design is also important, since infrastructure and technology can be adapted to encourage less driving, and it includes access management; intersection improvements; bottleneck removal; and integrated, interconnected, intermodal systems to serve the mobility needs of people and goods and foster economic growth. Finally, users can be barred from performing certain actions that would negatively impact the efficiency of the transportation system.

TSM policies can be instituted at every level of government. Some can have a virtually instant effect, while others require many decades to realize full benefits.

### Policy Design

**Goals:** The overarching goal is to reduce urban per-capita VMT in the range of 10–15% by 2030.

- Develop and implement policies and strategies that include program funding, financial and development incentives, infrastructure investment, and regulatory requirements to promote transportation system management improvements that result in reduced VMT and/or VHT which, in turn, result in reduced GHG emissions. These actions, taken in concert with other aggressive transportation and land use policy actions, should be designed to reduce urban per-capita VMT in the range of 10–15% by 2030; VHT can be reduced by amounts that are

associated with these VMT reductions. VHT reduction is recognized as a means of reducing driver delay, while also reducing excess fuel consumption in congested traffic.

- Reduce existing and future trips and trip lengths in an effort to reduce both VMT and VHT. Driving less, in terms of both hours and miles driven, will result in a decrease of GHG emissions. This can be achieved through the aggressive implementation of specific transportation demand management strategies and coordinated transportation and land use planning and decision making.
- Distribute existing and future trips in terms of both time and geography—when trips are taken and where trips are taken—to reduce congestion and smooth traffic flow. Reducing congestion and smoothing flow by changing people’s driving patterns—by changing either the time of day they drive or the route they take—will result in less idling and stop-and-go driving. This will reduce VHT and GHG emissions and can be achieved through increased investment in supporting transportation infrastructure, implementation of specific TSM strategies, and the aggressive implementation of specific transportation demand management strategies.
- Improve transportation system operations to improve travel conditions on the transportation network. This includes traffic signal coordination and remote communication, real-time traveler information and traffic monitoring and analysis, advanced computerized lane and parking space management, value pricing at future toll locations, intersection improvements such as roundabouts, diverging diamond,<sup>1</sup> grade separations, advanced incident management, and other traffic operations applications. This will reduce the frequency of transportation actions that contribute to high levels of GHG emissions (for example, quick starts, idling, and excessive braking). It will require an increased investment in TSM-related capacity/infrastructure and aggressive implementation of non-capacity operational strategies that improve the flow of vehicles (including smart/efficient integrated transit, bike, and pedestrian facilities) on the transportation network.

**Timing:** 2010–2030—Various TSM strategies have a variety of implementation time frames. Some, such as workplace-based strategies, can begin implementation almost immediately. Others that are based on infrastructure construction will have an implementation timeline of 4–10 years. Systemic changes to the urban landscape have the longest horizon—up to 25 years.

**Parties Involved:** Federal transportation agencies (FHWA, Federal Transit Administration); state government agencies (many Departments of KYTC and District Highway Offices, economic development agencies); state and local community affairs agencies; selected Kentucky environmental protection agencies; regional government agencies (metropolitan planning organizations [MPOs], area development districts [ADDs]) regional planning councils); regional transportation authorities; local transportation providers (public transit agencies, airports, river ports, expressway/bridge authorities; local governments and agencies.

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<sup>1</sup> A **diverging diamond interchange** is a rare form of diamond interchange in which the two directions of traffic on the non-freeway road cross to the opposite side on both sides of the bridge at the freeway. It is unusual in that it requires traffic on the freeway overpass (or underpass) to briefly drive on the opposite side of the road from what they are accustomed.

**Other:** None.

**Implementation Mechanisms**

**Related Policies/Programs in Place**

**Type(s) of GHG Reductions**

**Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

**Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

## TLU-3B. Transit Management

### Policy Description

This policy presents objectives and strategies intended to make transit a legitimate transportation choice for the citizens of Kentucky. As one result, the state will realize the potential for GHG reductions associated with transportation mode. The policy will:

- Support desired shifts in passenger transportation mode choice to lower-carbon options.
- Encourage growth and development in Kentucky that make effective and efficient use of the state's resources by supporting cost-effective mode choices.
- Improve existing transit service (e.g., expanded hours or coverage of bus service, higher-frequency bus routes, investments in rail transit) to generate greater use of public transit and a consequential reduction in automobile travel.
- Improve the level of transit service (travel time, reliability, and frequency) for urban buses and rail, through support of capital programs, such as signal prioritization, dedicated right of way, and bus rapid transit (BRT).

### Policy Design

An important strategy in reducing GHG emissions produced from transportation sources is reducing the growth rate in per-capita VMT. Providing alternatives to the SOV has been shown to reduce the number of trips and VMT on the highway system. Modal alternatives can include bus transit and paratransit, rail transit, ridesharing, and van pools (in addition to bicycling and walking, which are not addressed here).

Increased transit use is key to reducing the growth rate of VMT. A higher rate of transit use can be achieved by improving transit's competitiveness with other modes, expanding transit services, ensuring the safety and security of transit systems, and educating the public about transit options available in their community. Transit's competitiveness will be enhanced by providing the livable, walkable, complete streets context in which transit can be cost-effective. (See TLU-2.)

### Goals:

- By 2020, reduce VMT statewide by 20% from 2010 levels.
- Increase transit ridership statewide by 100% from 2010 levels by 2020, and an additional 150% by 2030. (Ridership will be measured on a per capita basis in order to prevent population demographics from affecting the goal.)
- By December 31, 2011, amend Kentucky's Statewide Transportation Improvement Program (STIP) to develop goals, objectives, and strategies for addressing climate change, reducing GHG emissions, and providing modal alternatives to the SOV.
- By December 31, 2011, include climate change considerations (e.g., VMT and GHG

emissions) in all MPOs and ADDs in the evaluation of candidate projects for long-range transportation plans and five-year Transportation Improvement Programs (TIPs).

**Timing:** See the Goals section, above.

**Parties Involved:** The Kentucky Public Transportation Association, public transit agencies, MPOs, local governments, and KYTC all have a place in implementing this policy. Communities that currently have public transit will be positively affected by the policy.

**Other:** None.

### Implementation Mechanisms

### Related Policies/Programs in Place

### Type(s) of GHG Reductions

### Estimated GHG Reductions and Net Costs or Cost Savings

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

### Key Uncertainties

### Additional Benefits and Costs

### Feasibility Issues

### Status of Group Approval

### Level of Group Support

### Barriers to Consensus

## TLU-4. Expand Transit Infrastructure (Rail, Bus, Bus Rapid Transit)

### Policy Description

DOT recently announced that the national average carbon dioxide (CO<sub>2</sub>) emissions per passenger-mile for bus transit is just two-thirds that of the average private automobile. When buses operate with all seats occupied, that fraction is reduced to less than one-fifth. The following additional data support this policy option.

- The U.S. Energy Information Administration forecasts that oil prices could rise to \$210 per barrel from their current level (approximately \$75/barrel) by 2035<sup>2</sup>. The rising cost of fuel will cause more Kentuckians to rely on public transit for travel needs.
- Kentucky is aging. According to the State Data Center,<sup>3</sup> by 2020, 16.5% of Kentuckians will be age 65 or older, increasing the need for locally based transportation options and a statewide transportation system less reliant on the automobile. At the other end of the spectrum, parents of teens who are too young to drive and don't have access to public transportation spend precious family time shuttling kids to their activities.
- Kentucky is facing an obesity epidemic. Many Kentuckians can't afford to own and operate private vehicles. Increased physical activity is critical to combating the obesity crisis. Since all transit trips begin and end as pedestrian trips, use of public transit is one tool available for fighting this epidemic.
- Public transit is the safest form of transportation in America today. In 2007, 864 people were killed on Kentucky roads, and, 38,786 people were injured. Of the 864 people killed, 49 were pedestrians and bicyclists, via 898 collisions with pedestrians and 433 collisions with cyclists.<sup>4</sup>
- Kentucky has one of the lowest per-capita funding rates for public transportation in the country. Currently that rate is less than \$ 0.30 per person annually.
- During 2008, Kentucky's three urban transit agencies (Lextrans, Transit Authority of River City, and Transit Authority of Northern Kentucky) provided 25,487,600 trips to passengers.
- Greater use of public transit and reduction in automobile travel can be achieved by expanding public transit infrastructure, both within and among Kentucky's communities. Infrastructure improvements, such as rail track upgrades or the conversion of mixed-traffic lanes to dedicated bus or light-rail lanes, can significantly aid level-of-service measures.

Public transportation improvements are critical to support livability initiatives (as referenced in TLU-2), and are essential to an ongoing effort to reduce VMT. As an example, a 2008 Transportation Research Board study found that households in 17 TOD developments around the

<sup>2</sup>U.S. Energy Information Administration Oil Forecast: <http://www.eia.doe.gov/oiaf/forecasting.html>.

<sup>3</sup> State Data Center Population Projections: <http://ksdc.louisville.edu/kpr/pro/projections.htm>.

<sup>4</sup> Also see: [http://highwaysafety.ky.gov/files/strategic\\_plan/HSP\\_FY2009.PDF](http://highwaysafety.ky.gov/files/strategic_plan/HSP_FY2009.PDF).

country took 44% fewer car trips than the Institute of Transportation Engineers' manual for a typical housing development suggests.

This policy includes four recommended components of change that are needed on the state level to expand and improve transit infrastructure:

- *Funding*—Current levels and allocation formulas of state funding for transit are inadequate to maintain—let alone substantially expand and improve—transit infrastructure to reduce VMT.
- *Studies and Planning*—The state will provide the technical assistance and leadership needed to assist or help initiate future studies with local governments and MPOs.
- *Technical Assistance*—The state will provide technical assistance, where needed, to promote TOD around transit nodes or hubs. Land use and transportation coordination will be improved to increase ridership through land use changes that support transit use in urban areas.
- *Transit Marketing and Promotion*—Incentives and marketing strategies aimed at increasing transit use will be used to shift more passenger transportation from cars to the existing transit systems and increase demand for transit.

The goals and strategies outlined in this policy option will support transit as a viable transportation choice for the citizens of Kentucky, and will help the state realize the potential for GHG emission reductions associated with transportation. At the same time, the policy will encourage growth and development in Kentucky that effectively and efficiently use the state's resources by supporting cost-effective transportation mode choices.

## Policy Design

### Goals:

- Increase transit ridership statewide by 100% from 2010 levels by 2020, and an additional 150% by 2030. (Ridership will be measured on a per capita basis in order to prevent population demographics from affecting the goal.)
- Expand and improve transit infrastructure to reduce VMT statewide by 20% from 2010 levels by 2020.
- Fully match all federal transit funding received in Kentucky by January 1, 2013.
- By December 31, 2011, amend Kentucky's STIP to develop goals, objectives, and strategies for addressing climate change, reducing GHG emissions, and providing modal alternatives to the SOV.
- By December 31, 2011, all MPOs and ADDs will include climate change considerations (for example, VMT and GHG emissions) in their evaluations of candidate projects for long-range transportation plans and five-year TIPs.

**Timing:** See the Goals section, above.

**Parties Involved:** The Kentucky Public Transportation Association, public transit agencies, MPOs, local governments, and the KYTC all have a place in implementing this policy. Communities that currently have public transit will be positively affected by the policy.

**Other:** None.

**Implementation Mechanisms**

**Related Policies/Programs in Place**

**Type(s) of GHG Reductions**

**Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

**Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

**TLU-5. Education and Outreach for Vehicle Maintenance, Idle Reduction, and Co-Driving, and Promote Alternative Modes of Travel**

**Policy Description**

Informing Kentucky’s citizens of how their daily activities can influence the ability of the Commonwealth to meet its objectives of reducing GHG emissions is essential for a successful climate change program. Slight modifications in behavior and habit can result in significant GHG reductions. Similarly, educating the public regarding how individual land use decisions affect GHG emissions is also integral to addressing this complex issue. To achieve the objective of a more informed citizenry, a comprehensive and coordinated education outreach program is required.

Education will need to address numerous topics, but three key areas have been identified as critical for raising awareness on this issue:

1. GHG emissions can be reduced by improving fuel efficiency, using such measures as:
  - a. Improved driving habits, including moderating acceleration, shifting at lower revolutions per minute (rpm), using cruise control, and reducing idling.
  - b. Maintaining proper tire pressure and appropriate levels of engine lubricants.
  - c. Selection of “best in class” replacement vehicles having higher fuel efficiency.
2. Promotion of alternative transportation modes that do not contribute GHGs.
  - a. Campaigns to promote use of transit riding, walking, and cycling, rather than vehicle use.
  - b. Educating drivers to “Share the Road” and cyclists to obey traffic laws.
3. Significant GHG reductions can be achieved through improved land use decision making.
  - a. Consider the impact of housing location on family transportation costs and GHG emissions.
  - b. Focus on reduced resource consumption.

Educational opportunities can come in many forms. Opportunities to cooperate and partner with existing promotional campaigns and public outreach should be sought. Development and implementation of a focused multi-media campaign will be a cornerstone of the educational program. Incorporating a GHG message into existing educational venues, such as the Kentucky Driver Manual and licensing exam for new drivers and the driver education classes provided by many Kentucky high schools should be considered. Mandating that driver education be offered as part of all Kentucky high school curricula may also be considered. Establishing a “Drive Smart–Drive Green” or other similarly monikered license plate may raise not only awareness but also funding for other education initiatives. Efforts to reach existing drivers can be made by distributing information when motor vehicle licenses or vehicle registrations are renewed. Partnerships with the insurance industry could result in reduced insurance rates for drivers who have completed “green drivers training” and pledged to follow the guidelines.

Promotion of the Smart Cycling program, a set of curricula for adults and children and the certified instructors who teach it, will be important for expanding the use of alternative modes of travel. Smart Cycling classes are taught across the United States by League Cycling Instructors (LCIs), certified by the League of American Bicyclists, to provide the tools, tips, and techniques to safely ride a bike, to be confident enough to share the road with vehicles, and to teach children to ride cautiously and conspicuously on their own. Simply knowing how to ride a bike is not the same as knowing how to operate a bike safely and legally. This training, in addition to Share the Road training for drivers, will be important as initiatives begin to show results and the number of cyclists on the road increases.

## Policy Design

This Climate Action Plan policy is intended to increase awareness of the general public of personal transportation-related behaviors, within their control, that may positively or negatively impact GHG emissions and climate change. In addition, education regarding land use (specifically housing) choice and its effects on GHG generation is also important to promoting a more informed community. An effective multimedia campaign can be developed that promotes improved driving habits and behavior, encourages use of alternative or more efficient means of transportation, emphasizes the benefits of proper vehicle maintenance, and explains the interconnection between land use decisions and the consumption of resources. Developing educational opportunities for both the driving and the cycling public will promote harmonious use of existing facilities and reduction in conflict between vehicles and those traveling along the roadside.

Measures developed will have the intent of promoting positive change through education statewide. These measures should appeal to the good will and common sense of the citizens statewide, resulting in behavioral changes that will improve community livability, which can be a source of pride for all Kentuckians.

### Goals:

- The objective will be to increase public awareness and understanding of these issues by 10% by 2020 and an additional 10% by 2030. The goal of the education and outreach program will be to raise awareness of the public to issues that may directly or indirectly influence GHG production and its implications for corresponding climate change. The level of public understanding and awareness will be measured through a statewide survey at the outset of the program to establish baseline conditions. The survey will be designed to measure awareness through numerical scoring of responses.
- The Smart Cycling initiative will be intended to reduce bicycle/vehicle conflicts and will be measured by doubling the number of counties where there are LCIs, certified by the League of American Bicyclists, by 2020. Additional goals related to bicyclists' fatality and injury rates resulting from vehicle conflict may also be considered.

**Timing:** Early development and execution of the baseline survey will be critical to establish existing conditions. Frequency of follow-up surveys will be determined by the implementing agency at an interval sufficient to develop meaningful feedback and support an iterative approach to program modification and improvement.

There currently are five counties with at least one certified LCI. Expansion of this population would likely be influenced by the ability to secure training at localities statewide.

**Parties Involved:** To develop and manage a statewide educational program, the Governor’s Office may establish a focus group, task force, advisory commission, or advisory committee that will consist, at a minimum, of representatives from KYTC, EEC, the Economic Development Cabinet, and the Education Cabinet. A Key Stakeholders Group may also include representatives of the Kentucky Broadcasters Association, Kentucky print media, the auto insurance industry, the Kentucky Public Transit Association, and the Kentucky State Police (KSP), as well as other organizations, public or private that may be identified as key to the success of the education program. The purpose of the group will be to oversee and administer a public education program to modify behaviors and promote change to reduce GHG emissions. KYTC will be responsible for the execution of the program.

The program developers may seek the involvement of the Kentucky Environmental Education Council for its skill in delivering educational programs to schools, and the public in general, as well as its experience conducting statewide surveys regarding public knowledge. Partnering of the program with other existing programs having similar or related messages, such as the KSP (Click-It or Ticket) and the KYTC Highway Safety program will also be advantageous. Measures addressing education of new drivers through modification of the Kentucky Driver Manual would also require the involvement and cooperation of the KSP.

To advance and promote bicycling education, the League of American Cyclists, area cycling clubs, and the public may be involved.

**Other:** None.

### **Implementation Mechanisms**

### **Related Policies/Programs in Place**

### **Type(s) of GHG Reductions**

### **Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

### **Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

## TLU-6. Land Use, Zoning, Tax, and Building Code Reform, and Connectivity

### Policy Description

This policy is designed to increase the number of walkable, bikable, compact, and mixed-use communities in the Commonwealth, provide incentives for their development, and extend the concept wherever feasible. This policy also strives to encourage infill development, increased density in support of transit services, and thus promote preservation of undeveloped land outside urbanized areas. Denser development requires less infrastructure to support a given population/employment base, resulting in lower costs for water, sewer, and utility services and reduced service distances, as well as reduced maintenance costs—all sustainable development practices.

The approach here is to emphasize the use of a public education program to inform the public and industry of the advantages and profitability of sustainable development. This is intended to encourage a cooperative transition to new ways of designing, building, and marketing urban development in the state. Local governments and industry would then use this information to identify best practices for the Commonwealth and subsequently develop policies, programs, and financial incentives to achieve the most appropriate sustainable growth possible.

Measures may include developing 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 density restrictions, and enabling mixed-use development.

### Policy Design

**Goals:** The Kentucky Chapter of the American Planning Association (KAPA), in consultation with related industries, would explore how comprehensive planning documents (comprehensive plans, metropolitan transportation plans (MTPs), statewide long-range plans (SLRPs), STIP, and metropolitan TIPs might best address sustainable development in the creation and update of those planning documents in the state and determine appropriate density measures for reducing GHGs and VMT. Comprehensive planning is an existing state program that provides an overview of local land use and develops recommendations and plans for future development in most urban areas in the Commonwealth.

Local governments would explore and utilize the newly released EPA toolkit for sustainable design, “Green Building for Local Governments.” This toolkit is designed to help local governments identify and remove barriers to sustainable design and green building within their permitting process. It addresses the local codes and ordinances that would affect the design, construction, renovation, and operation and maintenance of a building and its immediate site.

### Timing:

- Within three months of the completion and approval of this document:
  - Initiate discussions with KAPA and related industries.

- Within six months of the completion and approval of this document:
  - Disseminate to all local governments the EPA tool to assess current codes/ordinances and determine if barriers exist for sustainable design and green building.
- Within two years of the completion and approval of this Climate Action Plan:
  - Develop a statewide policy that requires “complete street” design be considered for all state and federal projects. (This is similar to KYTC’s existing “bike/ped” policy.)

**Parties Involved:** This requirement would apply to all roads that will receive state or federal funding. It would require support from FHWA, KYTC, and local governments. For neighborhood developments, it would involve planners, builders, electricians, architects, developers, utilities, and retailers of energy-efficient products. All efforts would involve the general public.

**Other:** None.

### Implementation Mechanisms

### Related Policies/Programs in Place

### Type(s) of GHG Reductions

### Estimated GHG Reductions and Net Costs or Cost Savings

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

### Key Uncertainties

### Additional Benefits and Costs

### Feasibility Issues

### Status of Group Approval

**Level of Group Support**

**Barriers to Consensus**

## TLU-7. Parking Management and Ride Sharing

### Policy Description

This strategy will reduce GHG emissions and lower fuel consumption by reducing the number of SOV trips resulting in fewer VMT. Parking management refers to policies and programs that result in more efficient use of parking resources. Reserved and preferential parking for HOVs near places of employment will further provide incentives to reduce SOV trips. HOV parking may be reserved at preferential locations, such as near building entrances or parking garage exits. Free or reduced-fee parking for HOVs may also be provided. Similarly, preferential parking and incentives can also be offered to drivers of vehicles with low GHG emission rates. Depending on effectiveness, these incentives could include preferential vehicle access to metered parking spaces or HOV lanes.

Providing safe, convenient park-and-ride lots will facilitate the use of car pooling, van pooling, and transit. The most utilized park-and-ride lots are those that are in highly visible locations, are police-patrolled and have direct access to transit if available. Locating park-and-rides near HOV-only highway lanes would complement this strategy. Promoting carpooling and vanpooling through ride-share matching, marketing, and public awareness increases the success of shifting to HOVs for work trips. Regional ride-matching programs provide a centralized database for matching drivers with others with similar commute schedules, origins, and destinations.

### Policy Design

An effective policy for parking management and car pooling will encourage more efficient travel choices. This is accomplished by facilitating the shift to HOVs, providing for the safety and security of HOV travelers, and encouraging the use of low-GHG-emitting vehicles.

**Goals:** Goals for this policy are as follows (from a 2005 baseline);

- Provide additional state funding for studies/plans and for design and construction of park-and-ride lots.
- Increase the number of park-and-ride spaces by 50% by 2030.
- Increase the utilization of existing park-and-ride facilities.
- Increase the number of car pool and van pool participants by 75% by 2030.
- Increase funding for regional and state ride-matching programs.
- Set standards for local jurisdictions to reserve parking spaces, provide transit or park-and-ride facilities, or offer free or reduced parking rates for HOVs and low-GHG vehicles.

**Timing:** 2010–2030.

**Parties Involved:** Kentucky legislature, KYTC, parking authorities and parking departments, local transit operators, local governments, MPOs, ADDs, other community agencies, commuters, large employers.

**Other:** None.

**Implementation Mechanisms**

**Related Policies/Programs in Place**

**Type(s) of GHG Reductions**

**Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

**Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

## TLU-8. Strategies to Move Freight in More GHG-Efficient Ways

### Policy Description

Trucking continues to deliver a majority of the freight in the United States and Kentucky. On a national level, the trucking industry delivers over 70% (by weight) of all the freight transported. In Kentucky, over 72% of the freight tonnage and over 90% of all commodities are delivered by truck. Existing infrastructure makes it unlikely that this distribution will be significantly changed at any point in the near future. According to the American Trucking Association, Inc. (ATA), the freight forecast predicts freight tonnage being moved by truck will continue to increase over the next several years. Kentucky can make significant strides in improving the efficiency and environmental impact of the necessary freight movements within its boundaries and current infrastructure.

Shifting freight from trucks to river and rail will decrease impacts on highway infrastructure, and will reduce GHG emissions and particulate matter.

The development of warehouses or distribution in the rural areas surrounding the larger cities in Kentucky is needed to improve inefficiencies within the supply chain. With additional square footage of distribution space, the ability to coordinate freight movements in non-peak times will increase, resulting in a reduction of congestion and emissions.

### Policy Design

Trucking is the first freight industry to widely use advanced diesel engine emission control systems. In 2002, the industry began buying new trucks that incorporate exhaust gas recirculation (EGR) and other emission control technologies to reduce tailpipe emissions of nitrogen oxide (NO<sub>x</sub>) by half. Since 2007 the new diesel trucks purchased by the industry will incorporate diesel particulate filters (DPFs) to reduce tailpipe emissions of particulate matter by 90%. These trucks also support the process of an additional 90% reduction in NO<sub>x</sub> emissions. To illustrate the significance of these reductions, every 60 new trucks purchased this year will equal the particulate emissions of 6 trucks purchased last year, and a single new trucks purchased 20 years ago.

To advance the use of these new emission reduction technologies, the trucking industry began transitioning to a new ultra-low-sulfur diesel fuel (ULSD) in 2006. ULSD, which represents the majority of the on-road diesel fuel being purchased in the United States, is refined to lower the sulfur content to near-zero levels (15 parts per million).

These latest efforts to improve air quality continue a nearly quarter-century trend of reducing truck emissions. In 2002 (the most current year for which data are available), on-road diesel engines contributed approximately 1% of the nation's total emissions of volatile organic compounds, carbon monoxide, and sulfur dioxide; less than 1.5% of the nation's total emissions of fine particulate matter; and approximately 16% of the nation's total emissions of NO<sub>x</sub> (EPA,

2005)<sup>5</sup>. Fine particulate emissions from on-road diesel engines have been cut by more than half over the past decade.

Even with all the improvements in technology, the challenge of significantly improving GHG emissions in the trucking industry is still very difficult. The vast majority (97%) of the motor carriers across the United States have 20 or fewer trucks. Many smaller trucking companies are unable to afford the upgrades and add-ons that would make a significant impact on their fuel efficiency and consumption. The bottom line is that most of these small companies who are operating on-road or off-road equipment have no capital, and their ability to obtain credit is limited. There is a need for increased public support for these measures.

Intermodal freight transportation combining truck, rail, and river is expanding across the United States every year. The ATA projects the largest increases in tonnage hauled will occur over the next 20 years. Intermodal freight movement can be more efficient than moving that same freight by a single mode of transport, depending on the distance, weight, and time sensitivity of the shipment. The tonnage of freight moved by intermodal mode in Kentucky is well below the national average. Kentucky needs to develop a strong intermodal infrastructure by improving intermodal connectors to increase rail and river capacity.

This policy recommendation should focus on reducing the carbon footprint for all modes of transportation.

**Goals:**

- Reduce congestion in urbanized areas by 20%.
- Reduce carbon emissions by 5% by railroads through increased deployment of innovative EPA-approved carbon emissions from hybrid and GenSet locomotives.
- Increase participation in the EPA SmartWay program by 10%.
- Reduce carbon emissions in commercial trucks by 10%.
- Encourage trucking companies to purchase carbon emission technology.
- Move freight more efficiently in certain transportation segments. Seek to increase road funding by 10% through increased overweight permit fees.
- Issue transponders to all commercial trucks based in Kentucky. Eliminate trucks that are in compliance with the weight standard from slowing or stopping at the scales. Reduce carbon emission by 2%.
- Reduce unnecessary idling at various locations that have large truck traffic. Reduction carbon emissions by 20% at these locations.
- Expand rail and river freight transport capacity by 10%.
- Reduce carbon emissions by 20% for rail, truck, terminal equipment, and water-going vessels.
- Reduce carbon emissions by 20% in the light to medium truck market.

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<sup>5</sup> U.S. Environmental Protection Agency: <http://www.epa.gov/otaq/hwy.htm>.

- Reduce unnecessary idling by 10% in the truck and rail industries.

**Timing:** 2010–2030.

**Parties Involved:** KYTC, local governments, Kentucky General Assembly, the Kentucky Motor Transport Association, river ports, railroads, shippers, developers, DOT, and MPOs.

**Other:** None.

### **Implementation Mechanisms**

### **Related Policies/Programs in Place**

### **Type(s) of GHG Reductions**

### **Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

### **Key Uncertainties**

### **Additional Benefits and Costs**

### **Feasibility Issues**

### **Status of Group Approval**

### **Level of Group Support**

### **Barriers to Consensus**

## TLU-9. Promote Consumption of Locally Produced Goods and Services

### Policy Description

Historically there have been many benefits inherent in buying locally produced goods and services. These goods and services were readily available—so much so that people didn’t have to make any real effort to “buy local.” Now it’s often more convenient to buy distantly produced goods (including food), which at face value appear to be cheaper. Indeed, most produce in the United States is picked four to seven days before being placed on supermarket shelves, and is shipped for an average of 1,500 miles before being sold. However, these “cheaper” goods are not always less expensive. There can be hidden economic, environmental, and societal costs in terms of transportation, packaging, reliance on pesticides, loss of local jobs, cycling of money outside the local community, loss of sense of community and community fabric, health impacts, and climate change.

This policy supports “buy local” programs, like the Kentucky Proud marketing campaign, promotes local cycling of dollars and resources, and reduces the need to haul freight. It will help identify local products and will promote and facilitate their purchase. While “local” is a relative term, for the purpose of this policy we are considering local to mean made in Kentucky, since this is a statewide climate action plan. Although buy local initiatives are sometimes viewed as “protectionism,” in many respects buying local allows communities to preserve and protect their heritage and way of life and to become more sustainable. The New Economics Foundation, an independent economic think tank based in London, compared what happens when people buy produce at a supermarket versus a local farmer's market or community-supported agriculture (CSA) program and found that twice the money stayed in the community when folks bought locally.<sup>6</sup>

### Policy Design

This policy will work by promoting and facilitating the purchase of local goods (particularly agriculture) and services produced in Kentucky. It will build on current initiatives wherever possible, such as the Kentucky Department of Agriculture’s Kentucky Proud program and may also entail creating new partnerships and initiatives.

**Goals:** The overarching goal is to reduce heavy-duty freight VMT by 5% below current projected levels by 2025.

The methodological approach will first involve developing estimates for the economic volume of the shift from foreign products and food to Kentucky-produced products and food. Once the amount of this shift is established, a factor will be established to allow the economic shift to indicate a reduction in imported freight transportation and an increase in intrastate freight transportation. From this change, an estimate of total heavy-duty and medium-duty VMT

<sup>6</sup> For more information, see: <http://www.sustainabletable.org/issues/eatlocal/>; <http://www.time.com/time/business/article/0,8599,1903632,00.html>; and [http://www.leopold.iastate.edu/pubs/staff/files/food\\_travel072103.pdf](http://www.leopold.iastate.edu/pubs/staff/files/food_travel072103.pdf).

avoided as a result of the policy will be established. Once an estimate of the VMT reduction from the freight sector is established, use of the Kentucky VISION (Voluntary Innovative Sector Initiatives) tool and emissions factors from GREET (Greenhouse gases, Regulated Emissions, and Energy use in Transportation) will allow for estimation of the GHG reduction potential of these strategies.

## SCHOOLS

**Goal #1:** Increase the number of public school districts participating in the “Farm to School” program to promote the use of locally grown foods in all K–12 public school lunch programs. Currently, 39 counties are participating per the Kentucky Department of Agriculture Web site. The aim is to have 50 counties participating by 2015 and 120 counties participating by 2030.

**Timing:** The project would begin in 2012. It would be partly implemented by 2015 and fully implemented by 2030.

**Parties Involved:** Kentucky Education Cabinet, Kentucky Department of Agriculture, local school districts, teachers. Affected parties: students, cafeteria staff.

**Goal #2:** Incorporate agriculture into the K–12 curriculum.

**Timing:** The project would begin in 2012 and would be fully implemented by 2015.

**Parties Involved:** Kentucky Education Cabinet, Kentucky Department of Agriculture, local school districts, teachers. Affected parties: students.

## ECONOMIC DEVELOPMENT

**Goal #3:** Encourage local governments to buy locally produced products by 2012. This project would build upon the mandates for state agencies to buy locally grown agricultural products under House Bill (HB) 669.

**Timing:** The project would begin in 2012, with a goal of having local governments buying 5% of goods/services locally by 2020 and 10% by 2030.

**Parties Involved:** Kentucky legislature, Kentucky Finance Cabinet, and local governments. Affected parties: citizens.

**Goal #4:** Create a “Made in Kentucky” logo/brand for nonagricultural products to complement the Kentucky Proud brand, or expand the Kentucky Proud brand to more nonagricultural products if practical.

**Timing:** The project would build upon current Kentucky Department of Agriculture and Economic Development Cabinet efforts. Implementation would begin in 2013 and continue annually.

**Parties Involved:** Producers, Kentucky legislature, Kentucky Departments of Agriculture, Tourism, and Economic Development. Affected parties: citizens.

**Goal #5:** Ask the Cabinet for Economic Development and the Kentucky Department of Agriculture (with the assistance of universities) to study and contrast the economic benefits of buying local versus distantly produced foods and products (if this has not been done already) to

include identifying distances that food typically travels, quantifying carbon emissions, cycling of dollars, and similar issues.

**Timing:** The project would begin in 2012 and would be completed by 2013.

**Parties Involved:** Kentucky legislature, Kentucky Economic Development Cabinet, Kentucky Department of Agriculture. Affected parties: citizens.

**Goal #6:** Identify needs and facilitate establishment of infrastructure needed for efficient transport, storage, and processing of local foods throughout Kentucky.

**Timing:** The project would be implemented by 2015.

**Parties Involved:** Kentucky Department of Agriculture, Kentucky Agriculture Extension Service, farmers. Affected parties: citizens.

### **FOOD EQUITY/FOOD SECURITY**

**Goal #7:** Encourage communities to include community and regional food planning in their five-year comprehensive plan reviews/updates.

**Timing:** The project would be implemented by 2013.

**Parties Involved:** Kentucky legislature, local governments. Affected parties: citizens.

**Goal #8:** Encourage gleaning of fresh produce for nonprofits by expanding gleaning networks and identifying gleaning sponsors. Reduce food waste in Kentucky from the current 20% to 10% by 2030.

**Timing:** The project would be implemented by 2012.

**Parties Involved:** Kentucky Department of Agriculture, local governments, community organizations, houses of worship. Affected parties: citizens.

**Goal #9:** Increase the availability of fresh produce to underserved populations (food equity) by increasing the number of farmers markets that accept Electronic Benefit Transfer (EBT), etc., by 2012 and to have all farmers markets accept EBT by 2020. In 2008, 11 markets reported they accepted EBT cards, and 9 reported they accepted credit and debit cards.

**Timing:** Ongoing efforts would be expanded.

**Parties Involved:** Kentucky Department of Agriculture, Kentucky Cabinet for Health and Family Services. Affected parties: citizens.

**Goal #10:** Provide local health departments with literature and training on gardening and gardening resources, as well as locations of farmers markets, food banks, and area stores where locally grown produce can be obtained for dissemination to the public.

**Timing:** The project would be implemented by 2012.

**Parties Involved:** Kentucky Department of Agriculture, Kentucky Cabinet for Health and Family Services, local health departments, Agriculture Extension Service, community organizations. Affected parties: citizens.

**Goal #11:** Establish legislation that would encourage local governments to establish community gardens and specifically exempt local governments from liability associated with use of municipal land for community gardens to make establishing community gardens on public lands more attractive to local governments. The goal would be to have a community garden for every 10,000 urban residents by 2020 and one for every 5,000 urban residents by 2030.

**Timing:** The project would begin being implemented by 2012 and would continue through 2030.

**Parties Involved:** Kentucky state legislature, local governments. Affected parties: citizens.

**Goal #12:** Facilitate establishment of local Food Policy Councils (FPCs) throughout Kentucky as well as a statewide FPC. FPCs bring together stakeholders from diverse food-related sectors to examine how the food system is operating and to develop recommendations on how to improve it. FPCs may take many forms, but are typically either are commissioned by state or local government, or are predominately a grassroots effort. FPCs would in all likelihood be supportive of and facilitate the other goals outlined in TLU-9.

**Timing:** The project would be started in 2012 and completed by 2020.

**Parties Involved:** Kentucky Department of Agriculture, Agriculture Extension Service, community organizations. Affected parties: farmers, citizens.

## Implementation Mechanisms

## Related Policies/Programs in Place

## Type(s) of GHG Reductions

## Estimated GHG Reductions and Net Costs or Cost Savings

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

## Key Uncertainties

## Additional Benefits and Costs

## Feasibility Issues

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**

## TLU-10. Promote the Use of Alternative Fuels

### Policy Description

#### Alternative Fuel Production Incentives

Adopt standards that require a certain amount or percentage of fuel sold within the state to be a renewable fuel (e.g., ethanol or biodiesel). This percentage can gradually increase over time. The state can help facilitate transition to renewable fuels by regulating quality standards for fuel blends. This option could also promote research and development related to biofuel 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).

#### Targeted State Fuel Procurement to Encourage Alternative Fuel Production

This might require minimum volumes of cellulosic ethanol and biodiesel to be blended into gasoline and diesel fuel commensurate with specified in-state production of these biofuels. This would be designed to ensure that biofuel produced will be blended and sold in the state—ensuring a market for biofuel producers.

#### Alternative-Fuel Infrastructure Development

Directly or indirectly 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 and offset the expense of equipment and installation costs. The convenient locations of stations offering alternative fuels at competitive prices can increase the use of the fuels. In addition, it is important to increase the availability, accessibility, and use of alternative fuels and low-sulfur diesel for off-road vehicles. Expand low-carbon fuel use to off-road and recreational marine vehicles. Provide incentives and support for low-carbon fuel infrastructure development.

### Policy Design

**Goals:** By 2025, Kentucky will derive from biofuels 12% of its motor fuels demand, while continuing to produce safe, abundant, and affordable food, feed, and fiber.

**Timing:** Current levels are approximately 6% primarily from E-10. Assume growth as B-2 and E-85 use increases.<sup>7</sup> Additional increases can be achieved by incorporating plug-in hybrid vehicles and compressed natural gas. Technology and research advances will also increase the use and availability of alternative fuels. By 2015, the state vehicle fleet fuel economy measured in miles-per-gallon (mpg) will improve by 30% (to 21.7 mpg), or by approximately 5 mpg, as compared to a 2007 baseline of 16.7 mpg.

**Parties Involved:** Meeting these goals would benefit citizens of the Commonwealth of Kentucky by generating new jobs and reducing the net per capita carbon emissions, while ensuring Kentucky's economic viability and assisting Kentucky in gaining energy independence

<sup>7</sup> E-10 is a fuel blend of 10% ethanol and 90% gasoline; B-2 is a blend of 2% biodiesel and 98% diesel; E-85 is a blend of 85% ethanol and 15% gasoline.

from imported oil. Parties involved in implementation include the General Assembly, state agencies, including departments in EEC, KYTC, Department of Agriculture, Facilities Services, Fleet Management, and the Finance and Administration Cabinet. Any state agencies with sizable fleets, such as elementary and secondary schools, colleges, and universities, and the KPS should also be involved. Affected parties that are also involved in implementation include private industry developers, commercial and retail distributors, post-secondary institutions, agriculture producers, renewable fuel producers, and technology innovators.

**Other:** The current largest deterrent for achieving this goal beyond current economic conditions is the limited availability of alternative fuel products for consistent consumption.

### **Implementation Mechanisms**

### **Related Policies/Programs in Place**

### **Type(s) of GHG Reductions**

### **Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

### **Key Uncertainties**

### **Additional Benefits and Costs**

### **Feasibility Issues**

### **Status of Group Approval**

### **Level of Group Support**

### **Barriers to Consensus**

## TLU-11. Promote the Use of Clean Vehicles

### Policy Description

Kentucky can reduce GHG emissions from the transportation sector by promoting the use of clean vehicles. Clean vehicles reduce GHG emissions through fuel efficiency, advanced vehicle technologies, and/or use of low-carbon fuels. The use of clean vehicles should be promoted through incentives and education. These vehicles include plug-in hybrids, natural gas vehicles, high-efficiency vehicles, hybrid-electric vehicles, electric vehicles, clean diesel vehicles, and clean diesel hybrid vehicles. Diesel vehicles have excellent fuel economy, and when paired with up-to-date pollution reduction devices (either by retrofitting older vehicles or as required for new models), they can be an effective means to reduce GHGs.

### Policy Design

To meet a goal for fuel efficiency improvement, the current baseline fuel economy must be identified. This information would need to be compiled by a state agency charged with implementing this policy. Once a baseline for Kentucky's fuel economy is established, the state could then establish goals for improving the fuel economy of the entire fleet as a basis for reducing GHG emissions.

In setting this goal, it is important to account for emission reductions that will occur as a result of national regulations. Recently, EPA and DOT's National Highway Traffic Safety Administration (NHTSA) finalized a joint rule that established a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles. In total, the combined EPA and NHTSA 2012–2016 standards will reduce GHG emissions from the U.S. light-duty fleet by approximately 21% by 2030 over the level that would occur in the absence of the national program.

Diesel fuel and engine standards have also been strengthened in recent years. In January 2001 and in June 2004, EPA finalized the Highway Diesel and Non-road Diesel Rules, respectively, which set more stringent standards for new diesel engines and fuels. The rules mandated the use of lower-sulfur fuels in diesel engines, which enabled the use of after-treatment technologies on new and retrofitted diesel engines that can reduce harmful emissions by 90% or more.

After-treatment technologies control emissions by removing pollutants from vehicle exhaust (i.e., filters) or converting those pollutants into less harmful components (i.e., catalysts). These technologies can be retrofitted onto older engines, and requirements have already begun being phased into new diesel vehicles and equipment, beginning in 2007 for highway and 2011 for non-road vehicles and equipment.

On average, diesel vehicles have longer useful lives than gasoline vehicles. Consequently, the in-use fleet will take much longer to turn over than the in-use light-duty (gasoline) vehicle fleet. However, with the use of cleaner diesel fuel, there are retrofit technologies available for most applications. These retrofits reduce emissions of air pollutants, allowing for the fuel efficiency

benefits of diesel engines with fewer negative impacts on air quality than older, dirtier diesel engines.

**Goals:**

- Implement a policy that will aim to achieve overall improvements in the average fuel-efficiency of new vehicles of between 12% and 25% by 2025, over and above project fuel-economy increases due to the accelerated CAFÉ standards due to enter into force in 2016. If this is done through monetary incentives such as tax credits, feebates, or registration fees, the eligibility requirements for vehicle purchasers to receive the incentive will determine the impact on new-vehicle fleet efficiency.
- By 2025, increase the number of clean diesel vehicles registered in Kentucky (either new or retrofitted) by 50%.
- By 2025, the state-owned vehicle fleet fuel economy will improve by 50% (to 25 mpg) as compared to the 2007 baseline of 16.7 mpg.

**Timing:** The timing for implementing these goals should align with Kentucky’s overall GHG reduction targets.

**Parties Involved:** EEC Department for Energy Development and Independence (DEDI), KYTC Division of Motor Vehicle Licensing; Kentucky Finance and Administration Cabinet, Kentucky Department of Revenue, county clerks, automobile dealer associations, automobile manufacturers.

**Other:** The design and implementation of measures intended to achieve this policy goal should be spearheaded by DEDI, but will need to be administered in partnership with the state and local agencies.

**Implementation Mechanisms**

**Related Policies/Programs in Place**

**Type(s) of GHG Reductions**

**Estimated GHG Reductions and Net Costs or Cost Savings**

**Data Sources:**

**Quantification Methods:**

**Key Assumptions:**

**Key Uncertainties**

**Additional Benefits and Costs**

**Feasibility Issues**

**Status of Group Approval**

**Level of Group Support**

**Barriers to Consensus**