TLU-4 Improving 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 in an effective and efficient manner. Effective system management may utilize a variety of strategies based on advanced technologies, market-based incentives, regulations and design standards. Each strategy provides a relatively small benefit to greenhouse gas (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 vehicle (SOV), shorten trip lengths, reduce vehicle delay, increase the reliability of the transportation network and reduce idling and other transportation actions that result in increased GHG emissions. The goal of TSM is to reduce the daily vehicle miles traveled (VMT) per capita on the transportation network. Effective TSM will also reduce vehicle hours traveled (VHT) per capita, which measures the amount of traffic congestion delay. Reduction of either VMT or VHT is highly correlated with a reduction in GHG emission.

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, lane management, traveler information displays, and other intelligent transportation system 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 includes and include access management applications and intersection improvements. Last, 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 affect, while others require many decades to reap full benefits.

Policy Design:

Goal levels: 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 area VMT by 7-10% by 2020 and by 9-12% by 2050 and VHT by similar amounts.

- 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 decision-making.

- Distribute existing and future trips in terms of both time and geography – when trips are taken and where trips are taken – in order to reduce congestion and smooth traffic flow. Reducing congestion and smoothing traffic flow by changing peoples driving patterns–either by changing the time of day that they drive or the route that they take–will result in less idling and stop-and-go driving. This will reduce VHT and GHG emissions. This can be achieved through increased investment in supporting transportation infrastructure, implementation of specific transportation system management 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, real-time traveler information, advanced computerized lane and parking space management, value pricing at toll locations, intersection improvements including round-about conversions, advanced incident management and other traffic operations applications. This will reduce the frequency of transportation actions that contribute to high levels of GHG (jack rabbit starts, idling, excessive braking, etc.). It will require an increased investment in transportation system management related infrastructure and aggressive implementation of non-capacity operational strategies that improve the flow of vehicles on the transportation network.

Timing: TSM strategies have a variety of implementation timeframes. Some, such as workplace-based strategies, can begin implementation almost immediately. Others that are based on infrastructure construction will have an implementation timeline of four to ten years. Systemic changes to the urban landscape have the longest horizon, up to 25 years.

Parties Involved: State government agencies (DOT, DCA & DEP), regional government (MPOs, RPCs & RTAs), Local transportation providers (public transit agencies, airports, seaports and expressway/bridge authorities), local governments.

Implementation Mechanisms

Collectively, the implementation mechanisms recommended under this policy attempt to reduce GHG emissions by enhancing system efficiency and modifying travel behavior and conditions through transportation system management strategies. Those strategies will require a combination of program funding, financial and development incentives, infrastructure and technology investment, and regulatory requirements implemented at the state, regional and local level.

Reduce existing and future trips and trip lengths: These implementation mechanisms are intended to result either in the reduction of trip lengths or the complete elimination of certain trips. This will result in a reduction of both VMT and VHT which will reduce GHG emissions. Implementation mechanisms intended to reduce trips and trip lengths include:

- Encouraging and/or incentivizing public and private sector employers to implement telework programs for eligible employees. This will result in fewer work-based vehicle trips.
- Encouraging and/or incentivizing public and private sector employers to implement job sharing programs for eligible employees. This will result in fewer work-based vehicle trips.
- Encouraging and/or incentivizing public and private sector employers to implement carpooling/vanpooling programs for eligible employees. This will result in fewer work-based vehicle trips.
- Requiring and/or incentivizing enhanced coordination between land use and transportation decision-making to reduce distances between clusters of affordable housing and employment opportunities. This will reduce work-based vehicle trip lengths.

Distribute existing and future trips in terms of both time (when a trip is taken) and geography (where a trip is taken): These implementation mechanisms are intended to change peoples driving patterns and behaviors (either by changing the time of day that they drive or the route that they take) resulting in reduced congestion and smoother traffic flows. Reducing congestion and smoothing traffic flow by will result in less idling and stop-and-go driving which will, in turn, result in reduced GHG emissions. Implementation mechanisms intended to change peoples driving patterns and behaviors include:

- Encouraging and/or incentivizing transportation facility operators to implement value pricing policies. This will encourage travelers to change the time of day they make various types of trips and result in fewer vehicle trips during peak operating hours. Alternatively, this will encourage travelers to change the route by which they make various types of trips and result in a more even distribution of vehicle trips across the transportation network.
- Encouraging and/or incentivizing public and private parking facility operators to implement smart parking policies. This will encourage travelers to change the time of day they make various types of trips and result in fewer vehicle trips during peak operating hours.
- Encouraging and/or incentivizing local governments and private developers to build up the supporting transportation network (lower functional class street network, local transit routes supporting express bus routes and premium transit options, more sidewalks and bike paths, etc.). This will encourage travelers to make appropriate route and mode choices and result in a more even distribution of vehicle trips across the transportation network.
- Encouraging and/or incentivizing public and private sector employers to implement flex time and compressed time programs for eligible employees. This will result in fewer work-based vehicle trips during peak operating hours and, in the case of compressed time programs, fewer work-based trips overall.

Improve transportation system operations to reduce occurrences of transportation actions that contribute to high levels of GHG (jack rabbit starts, idling, excessive braking, etc.): These implementation mechanisms are intended to maximize the efficiency of the transportation system through the application of technology and advanced design. Management of the supply of transportation capacity through the application of various technologies and design strategies will result in reduced congestion and smoother traffic flows. Reducing congestion and smoothing traffic flow will result in less idling and stop-and-go driving which will, in turn, result in reduced GHG emissions. Implementation mechanisms intended to change peoples driving patterns and behaviors include:

- Increase investment in intelligent transportation system (ITS) technologies at all levels. In particular, investment should be focused on technologies that smooth the flow of traffic (reducing congestion, braking, idling, etc.), resulting in a reduction of VHT and GHG emissions.
- Increase investment in incident management programs and technologies. Quickly responding to incidents will reduce the negative impacts that incidents have on the smooth flow of traffic. Incident management can also include roadside assistance programs such as FDOT's "Road Rangers." Incident management will result in a reduction in incident related stop-and-go traffic, in turn reducing VHT and GHG emissions.
- Increase investment in traffic signal coordination. This will smooth the flow of traffic on the roadway network and result in reduced idling, braking and jack-rabbit starting, in turn reducing VHT and GHG emissions.
- Encourage and/or incentivize access management programs at all levels, particularly those that coordinate land use and transportation decision-making. This will reduce conflicts on the roadway and make vehicular movements more predictable (including for transit vehicles, bicyclists and pedestrians). This will result in smoother traffic flows and reduced stop-and-go traffic conditions, reducing VHT and GHG emissions.
- Increase investment in traveler information technologies. This will provide travelers with a more predictable travel experience and let them make rational choices that maximize their efficient use of the transportation network. This will result in less congestion and VHT and, in some cases, reduced VMT.
- Increase investment in managed lanes technology. Real time lane management allows for the more efficient flow of vehicles through the transportation network, maximizing available capacity and smoothing traffic flow. This will result in less congestion and VHT and, in some cases, reduced VMT.

Related Policies/Programs in place:

TBD

Estimated GHG Savings and Cost Per Ton:

	2010	2020	Units
GHG Emission Savings			$MMtCO_2e$
Net Present Value (2006-2020)			$ Million
Cumulative Emissions Reductions (2006-2020)			$MMtCO_2e$
Cost-Effectiveness			$/MtCO_2e$

- **Data Sources:** TBD
- **Quantification Methods:** TBD
- **Key Assumptions:** TBD

Key Uncertainties

TBD

Additional Benefits and Costs

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

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TLU-5 Increasing Choices in Modes of Transportation

Policy Description:

An important strategy in reducing greenhouse gas (GHG) emissions produced from transportation sources is reducing the growth rate in vehicle miles of travel (VMT) per capita. The number of trips on the highway system and VMT per person can be reduced by providing modal alternatives to the single-occupant vehicle. Modal alternatives can include bus transit, rail transit, paratransit, ridesharing, greenways, on and off road bicycle facilities and all manner of pedestrian facilities.

Public transit vehicles generate much lower levels of GHG per person-mile. The challenge is that transit (bus and rail) accounts for only 2 percent of trips made in the United States today, compared with 5% in Canada and 10% in Western Europe.[1] An expansion of transit services will require a substantial increase in funding for both infrastructure and operations. Increased transit use is key to reducing the growth rate of VMT. A higher rate of transit use can be achieved by expanding transit services, increasing transit's competitiveness with other modes, ensuring safety and security of transit systems, and educating the public about transit options available in their community.

Many employers partner with local governments and non-profit agencies to promote and fund local carpooling and vanpooling programs. These rideshare alternatives, combined with employee incentives, telecommuting, and parking strategies are often effective in reducing travel demand and ultimately, VMT. High-occupancy vehicle (HOV) lanes or high-occupancy toll (HOT) lanes on major transportation corridors can encourage ridesharing by providing reduced travel times and/or tolls for vehicles carrying passengers.

Bicycling and walking do not generate GHGs. A convenient and comprehensive bicycle and pedestrian network can be a pleasant, stress free option to driving on congested roadways. Although each modal alternative by itself may not significantly reduce GHGs, an integrated system of bicycle, pedestrian and public transportation facilities could provide a significant benefit in enhancing mobility while reducing the growth rate in VMT.

Policy Design:

Goal levels: Double transit ridership to equal levels found in Canada. Increase the percentage of people that walk, bicycle, carpool, vanpool or telecommute. Develop and implement policies and strategies that include program funding and financial incentives that expand non-automobile infrastructure and provide modal alternatives to single-occupant vehicle travel.

Timing: 1-30 years

Parties Involved: Public transit agencies, local governments, metropolitan planning organizations, regional transportation authorities, Florida Department of Transportation and local businesses

Implementation Mechanisms

Improve availability and accessibility of service

- Create new public transportation systems and options, including bus rapid transit (BRT). New transit systems and routes can serve areas presently without transit, or they can add new destinations from areas currently served.
- Encourage local governments and developers to provide and expand bicycle and pedestrian networks. A more complete infrastructure will entice travelers to shift from single occupant vehicles to walking or bicycling for appropriate trips. Better bicycle and pedestrian access also promotes transit use, since all transit trips begin and end as a pedestrian.
- Create new rail systems for passengers and freight. Work with rail companies to expand intercity passenger services. Partner with ports and rail lines to expand freight rail facilities to reduce the need for trucks on the roadways and incorporate rail services in the planning and design of new transportation corridors.
- Construct new or expand existing High Occupant Vehicle (HOV) or High Occupant Toll (HOT) lanes. This will encourage travelers to shift from single occupant vehicles to high occupant vehicles for all types of trips, particularly during peak hours. Transit vehicles can also use HOV/HOT lanes to gain a time advantage over operating in standard traffic lanes.

Increase the competitiveness of alternative modes:

- Increase investment in public transit systems to provide more frequent service and longer service hours, making transit more time competitive with single-occupant vehicle travel. This will encourage travelers to shift from automobiles because their wait time for their needed bus or train will be shorter.
- Hold steady or decrease the user cost of transit, making transit more cost competitive with single-occupant vehicle travel. As fuel prices increase, people will find significant cost savings in moving to alternative modes. Group discounts and employer pass programs can also reduce the cost to the user.
- Increase capital investment and management procedures to ensure reliability of transit service. Users, particularly those who can afford a car, will be more likely to use transit if the service is reliably on-schedule and on-time.
- Simplify and streamline the use of transit through fewer required transfers.
- Allocate preferred and discounted parking spaces to vanpools and carpools.
- Offer “guaranteed ride home” programs to those who regularly use transit, vanpools, or carpools. Under these programs, people who must work beyond their usual shift

ending time receive free or discounted taxis or door-to-door transit. This gives flexibility to the worker's schedule and encourages the use of alternative modes.

Alternative modes must be safe and secure:

- Public transportation must be secure. Patrons should be able to observe law enforcement and counter-terror procedures and feel safe while using public transportation services. The public is mindful of the vulnerability of mass transit systems, and is more likely to ride if they feel secure.
- Crime must be kept to minimum on the streets and on transit. If the streets are not safe, people will not walk or ride a bicycle. Similarly, if transit vehicles and stations are unsafe, everyone who can drive will do so.
- Passengers must be safe from injury on the transportation system. This includes traffic control measures, intersection markings, and proper signage.

Educate and market the availability of alternative modes:

- The benefits of alternative modes must be promoted to the public. Information on transit and bicycle/pedestrian facilities should be distributed by direct mail, traditional advertising, schools, and employers. The more knowledge the public has about their options, the greater share of alternative mode use.

Related Policies/Programs in place:

TBD

Estimated GHG Savings and Cost Per Ton:

	2010	2020	Units
GHG Emission Savings			$MMtCO_2e$
Net Present Value (2006-2020)			$ Million
Cumulative Emissions Reductions (2006-2020)			$MMtCO_2e$
Cost-Effectiveness			$/MtCO_2e$

- **Data Sources:**

[1] *Making Transit Work: Insight From Western Europe, Canada, and the United States—Special Report 257*. Transportation Research Board: Washington, DC. 2001.

- **Quantification Methods:** TBD
- **Key Assumptions:** TBD

Key Uncertainties

TBD

Additional Benefits and Costs

TBD

Feasibility Issues

TBD

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD