DRAFT
Transportation and Land Use Sector
Brief Descriptions of Potential State Actions

TLU-1 VEHICLE TECHNOLOGY

1.1 State Clean Car Program

A clean car program is also known as the "Pavley" standards or the California GHG Emissions Standards. These standards can be adopted to reduce GHG emissions from new light-duty vehicles. New cars and light trucks in all states must comply with Federal emission standards, and, generally speaking, states have the choice of adopting a stronger set of standards applicable in California. A set of standards typically include the gradual increase in the rates of emissions reductions over certain periods of time. Further, a state can include other smog- and soot-forming pollutants in this plan. Manufacturers may meet this standard by utilizing a fleet-wide average. Eleven (11) states already have adopted the California Clean Car Program standards: California, Connecticut, Maine, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.

1.2 Fuel-Efficient Tires

Fuel-efficient tires may also be referred to as low rolling resistance tires. Rolling resistance refers to the force required to keep a tire moving at a constant speed. Fuel economy can be improved on light-duty vehicles by setting minimum energy efficiency standards for replacement tires. Typically energy efficient tires are used on new models, however, lower rolling resistant replacement tires are not readily available to consumers and there is little information regarding the fuel economy of replacement tires.

1.3 Freight Vehicle Technology Improvements

Freight vehicles can be improved by a number of new technologies on the market. Diesel oxidation catalysts oxidizes the soluble organic fraction (SOF) of particulate matter and converts into carbon dioxide and water. Used in conjunction with engine management techniques, this improvement can also reduce NOx emissions. The diesel particulate filter collects particulate matter in the exhaust stream. See TLU 1.5. Selective catalytic reduction, also used to reduce NOx from stationary sources, can be applied to freight vehicles as well. In trucks, it reduces particulate matter, hydrocarbon emissions, and NOx. The EPA has a fact sheet containing

numerous options of verified retrofit technologies and the estimated percentage of pollution reduction at http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm.

1.4 Allow Increased Size and/or Weight of Trucks

In order to reduce the frequency of trips with freight vehicles, it is possible to increase the current size or weight limit of freight vehicles. With the ability to transport more cargo at once, this will reduce the number of vehicle miles traveled, thereby reducing the GHG emissions.

1.5 Black Carbon Control for Freight Vehicles (e.g., particulate traps)

Diesel particulate filters collect particulate matter (black carbon) in the exhaust stream. These filters can be installed on both new and used vehicles, but they must be used in conjunction with low sulfur diesel.

1.6 Procurement of Low-GHG Fleet Vehicles (fuel efficiency, alternative fuels)

The state could "lead by example" through procurement policies aimed at achieving a lower-emitting vehicle fleet for the State. Legislation could require the State increase its use of biofuels, E-8, hybrid vehicles, and other low-emissions fuels and vehicles in its own fleet, thereby meeting or exceeding the targets set for the state as a whole.

An EPA program called SmartWay provides further options to reduce GHG emissions from fleets. State agencies with vehicle fleets could sign on as SmartWay carrier partners. Enabling measurement of the fleet's environmental performance gives a baseline with which to improve that performance. For agencies that buy transportation services or ship goods, SmartWay gives members the option to select SmartWay partners when selecting carriers.

1.7 "Feebates" (state-specific or regional)

"Feebate" program studies have been initiated in a few southwest states to explore benefits and costs. A multi-state approach is useful because of drawbacks in a single state adopting "feebates" in isolation. California, New Mexico, and Arizona are three states currently researching the feasibility of incorporating "freebates" into their GHG reduction programs.

"Feebates" would provide incentives for reduced GHG emissions by creating: (1) fees on relatively high emissions/lower fuel economy vehicles and (2) rebates or tax credits on low emissions/higher fuel economy vehicles.

1.8 GHG-Linked Registration Fees (e.g., to fuel efficiency, alternative fuel, or VMT)

Higher vehicle registration fees can be charged for vehicles that have lower fuel economy. In the alternative, vehicles that use alternative fuels or hybrid vehicles could be charged a lower vehicle registration fee. Further, the state could institute a system wherein the registration fees increase as the number of miles driven per year per vehicle increases. These options would promote purchases of vehicles with higher fuel economy and encourage less vehicle travel.

1.9 Tax Credits for Low-GHG Vehicles (fuel efficiency, alternative fuel)*(S)

Currently the federal government offers tax credits for hybrid vehicles upon first purchase or placement into use. This idea can be implemented on a state-wide basis for the first time purchase of a hybrid, alternative fuel vehicle, or other set of specifications that incorporates low-GHG emission standards.

1.10 Incentives for Low-GHG Vehicles (preferential parking, use of HOV lanes)

Incentives offered to drivers can promote the sales of light-duty vehicles with hybrid gasoline-electric power trains. Incentives could include reduction in fees and taxes and giving preferential infrastructure access to hybrids on carpool lanes or metered parking spaces.

With the demand for hybrids increasing, automobile manufacturers are likely to increase production capabilities for hybrid power train vehicles and provide consumers with many more choices of hybrid cars. As a result, hybrid promotion and incentive programs are likely to have some incremental positive net effect on consumer purchase behavior.

1.11 Incentives to Retire or Improve Older High-GHG Vehicles (passenger or freight)

GHG black carbon emissions can be reduced from heavy-duty diesel vehicles by developing and implementing an incentives program to accelerate the replacement and/or retirement of the highest-emitting diesel vehicles.

Starting with the 2007 model year, the federal emission standards for new heavy-duty diesel vehicles were improved, and the sulfur content of diesel fuel was lowered significantly. The combination will significantly reduce GHG black carbon emissions from heavy-duty diesel trucks and buses. However, a large number of older, more-polluting diesel vehicles will remain in the fleet. Incentives can be offered to the owners of these older vehicles to retire their vehicles early and replace them with vehicles meeting the 2007 emission standards.

1.12 R&D on Low-GHG Vehicle Technology (e.g., fuel cells)

Research is constantly on-going for low-GHG vehicles, including hydrogen vehicle technology and infrastructure. The state could support such research, including such components as fuel cells, development of alternative fuels, infrastructure and refueling networks, pilot projects, and other incentives.

TLU-2 VEHICLE OPERATION

2.1 Lower and/or Enforce Speed Limits

Reduced vehicle speeds increase fuel economy, reduce CO2 emissions, and improve safety. This could be implemented by requiring interstates, freeways, and major arterials to be signed with a

maximum speed that is lower than the current speed. Additionally, significant enforcement resources may be needed for this measure to achieve the expected reductions.

2.2 Vehicle Maintenance, Driver Education (e.g., tire inflation)

Better consumer information and education could lead to a gain in fuel efficiency. Driver education could be geared to encourage energy-efficient driving habits. Drivers also need to be aware of maintenance issues that cause an increase in pollution and vehicle operating cost.

2.3 Adopt and/or Enforce Anti-Idling Regulations for Buses/Trucks

Anti-idling ordinances are typically enhanced by promotion and expansion of technologies that reduce heavy-duty vehicle idling. These technologies include: automatic engine shut down/start-up system controls; direct-fired heaters (for providing heat only); auxiliary power units; and truck stop electrification (see TLU 2.4). A phased enforcement program, beginning with different seasons of the year, times of day, or days of the week are possible options to ease the transition for the industry.

2.4 Truck Stop Electrification

Truck stop electrification can be utilized effectively in conjunction with anti-idling ordinances (see TLU-2.3 above). Electrification reduces the amount of time vehicles idle by permitting the truck drivers to shut off their engines and obtain heating, cooling, electrical outlets, and communication and entertainment options through a delivery tube provided in electrified truck stop spaces that connect to the truck through a window adapter. The diesel engine does not need to be on in order for the driver to maintain comfort in the cab overnight.

2.5 Pre-Clearance at Truck Scale Houses

Pre-clearance at truck scales permit trucks to drive through certain weigh station areas without stopping, thereby reducing idling time. Trucks are weighed while traveling at high speed by scales in the roadway. As the truck passes the station, an automatic vehicle identification device looks for signals from a small transponder mounted inside truck windshield. The truck is weighed, the transponder records the truck's identifying information, the transponder verifies the vehicle specifics such as height and weight, records are checked, and a green light signal is sent back to the transponder if the truck is permitted to pass through.

TLU-3 ALTERNATIVE FUELS

3.1 Renewable Fuel Standard (ethanol and/or biodiesel)

This standard can require a certain amount or percentage of fuel sold within the state to be an alternative fuel. This percentage can gradually increase over time.

3.2 Fuel Quality Standards (e.g., ASTM standards for ethanol/biodiesel)

Through the National Energy Act, growth in alternative fuels is expected in the near term. More widespread acceptance of alternative fuels may be achieved by setting standards for neat biodiesel (B100), biodiesel blends, and ethanol blends to ensure fuel quality and good vehicle performance. For biodiesel blends, the biofuel portion and the petroleum diesel portions of the fuel are separately regulated through ASTM standards; however, no standard is currently in place for the blended biodiesel. Similarly, for ethanol blends, E85 and the gasoline portion of ethanol blends are regulated by ASTM standards. The state could set standards for the blended biodiesel and ethanol blends.

3.3 Alternative Fuel Mandates for State/Local Fleets

Increased market penetration of biodiesel fuels, ethanol, and other alternative fuels could significantly increase consumption and become a substitute for conventional fuels. This program may have a certain percentage of penetration within a certain period of time. Implementation mechanisms for this measure could include: information on the benefits and potential performance issues associated with using alternative fuels, voluntary agreements targeting certain fleet segments, a possible alternative fuel use requirement for fuel vendors, and an early pilot program for use in state vehicles.

3.4 Alternative Fuel Production Incentives (reduced fuel taxes, production tax credits, loans, etc.)

Various incentives can encourage companies to continue or begin producing alternative fuels. The incentives can come in many different forms, such as granting state tax credits based on the amount of alternative fuel produced, reduced taxes for alternative fuel production facilities, or providing loans or grants to companies that are producing or want to produce alternative fuel.

3.5 Targeted State Fuel Procurement to Encourage Alternative Fuel Production (Pennsylvania example)

The state can organize a public/private fuel-buying consortium that enters a long-term contract with a supplier to help overcome the risk of producing fuel using an innovative technology.

3.6 Alternative Fuel Infrastructure Development

The development of an alternative fuel infrastructure can aid in the promotion of alternative fuel usage. The expense of equipment and installation costs can be offset by creating an infrastructure. The convenient locations of stations offering alternative fuels at competitive prices can increase the usage of the fuel.

TLU-4 LAND USE AND LOCATION EFFICIENCY

4.1 Infill, Brownfield Re-development

Shifting housing and commercial development toward location efficient sites, such as brownfields and infill parcels, and away from location inefficient sites, such as greenfields, reduces overall travel demand and expands lower emitting mode choices. Brownfields are commercial or industrial properties that are abandoned or are not being fully used because of actual or perceived environmental contamination. These properties have potential for redevelopment, but the uncertainty and risk of environmental liability and the cost of investigation and cleanup keep them from being redeveloped. Examples of brownfields include former industrial properties, abandoned gas stations, vacant warehouses, or former dry-cleaning establishments. Redevelopment of these contaminated properties creates jobs, revitalizes neighborhoods, increases property and sales tax revenues, decreases urban sprawl, and reduces potential health risks to the local community. Infill development and increased density can also revitalize neighborhoods, increase tax revenues, and decrease urban sprawl. One mechanism to promote infill and brownfields development is an urban growth boundary.

4.2 Transit-Oriented Development

Transit oriented development enables shifts to lower emitting transportation modes by building compact, mixed-use development clustered around transit stops so that people can meet daily needs by foot, bicycle, or public transit. Instead of sprawling development away from transportation modes and cities, an area can explore the possibility of revitalizing areas near the current transportation modes.

4.3 Smart Growth Planning, Modeling, Tools

Smart growth allows for mixed land uses with a range of housing opportunities and multiple transportation options including pedestrian/bike access. State actions to support smart growth include planning, modeling, and regulatory tools that support location efficient growth. State-funded investments can target smart growth communities that are proximate to household amenities (such as jobs, shopping, school, services, entertainment, etc.) as opposed to growth in areas that are not proximate and require greater travel distance and have less mode choice.

4.4 Targeted Open Space Protection

Targeted open space protection includes programs designed to protect and conserve State lands and other open spaces, and develop and improve neighborhood, community, and regional parks in ways that encourage location-efficient growth and broader mode choice.

4.5 "Fix-it-First" Funding Strategies

A "Fix-it-First" policy funds repairing existing roads, bridges, and mass transit before spending tax dollars on new road projects.

4.6 Location-Efficient Mortgages

Homebuyers who purchase homes in urban areas can take advantage of location-efficient mortgages. This type of mortgage can increase the loan amount by considering the money saved by living close to transit, jobs, stores, and services.

4.7 Parking Pricing or Supply Restrictions

Numerous factors are influenced by the location, supply, and pricing of parking. Accessible parking or restrictive parking has an impact on development opportunities, property values, and urban form. The availability of parking is important to travelers, and it can affect which mode of travel to use, where the traveler is going, and how often the traveler goes. Managing parking by restricting parking availability will encourage more transit usage.

4.8 VMT/GHG Offset Requirements for Large Developments

Emissions from automobiles, freight trucks, and heavy machinery during development can be offset by any plan that improves or reduces emissions. These offsets can include preserving open spaces, purchasing emission credits, or converting to alternative fuel energy sources, for example.

4.9 Assess Use of CMAQ Funds

To assess the use of Congestion Mitigation and Air Quality funds, the total costs, estimated annual emissions reductions, and the length of the project must be taken into consideration. The Department of Transportation has various plans for the data collection, analysis, and evaluation of the CMAQ projects.

4.10 Property Tax Incentives

Changes in property tax structure could provide incentives for development patterns that result in fewer GHG emissions. One option would be to introduce a split rate property tax such that the vehicle parking is taxed separately from the dwelling unit. This would help to encourage lower vehicle ownership and a reduction in driving. Another option would be to tax vacant infill parcels at a higher rate than developed parcels as a way to encourage reuse of infill land.

4.11 GHG Conformity for Transportation Plans

In areas designated non-attainment for federal air quality standards, transportation agencies are required to demonstrate that transportation plans and programs will not result in air pollution that would prevent achievement of the region's air quality attainment goals. This concept of

"transportation conformity" could be extended to GHG emissions. Transportation planning agencies (i.e., CDOT and MPOs) would need to calculate the future year GHG emissions resulting from their plans and demonstrate that the emissions would not exceed a specified level.

TLU-5 TRANSPORTATION SYSTEM EFFICIENCY

5.1 Transportation System Management (improved traffic flow, HOV lanes, intelligent transportation systems, etc.)

Transportation system management allows for movement of the public and freight in an efficient manner. Also, the coordinated operation of the regional transportation network can improve system efficiency, reliability, and safety. Tools to lessen traffic congestion could be the implementation of HOV lanes, utilizing cameras in traffic to aid in the control of traffic flow when incidents occur, synchronized signals, and priority establishment for emergency vehicles to name a few.

5.2 Integrated Air/Rail/Bus Networks

Integrating air, rail, and bus networks could provide more travel opportunities to passengers by locating most modes within the same area. Further, coordinating schedules between modes for popular transportation routes can ensure more trips via public transportation instead of by privately owned automobile.

5.3 Multi-Modal Freight Initiatives

Transport of freight goods can be shifted from the roadway system to rail. Carrying freight by rail rather than truck can significantly reduce emissions and fuel consumption while reducing congestion on major roadways. This could provide an incentive to reduce sprawl. Further reductions could be realized by electrifying rails. In many cases, freight can be carried by rail more economically and at lower GHG emission levels than over the existing roadway system, particularly for long-distance freight.

5.4 Expand Transit Infrastructure (rail, bus, Bus Rapid Transit)

Passengers may shift transportation modes to lower GHG emitting choices through improved infrastructure and public education. Consolidating numerous modes of transportation in a particular area, along with improving bike and pedestrian routes nearby, can increase the likelihood that people will utilize lower GHG emitting transportation options.

5.5 Improve Transit Service (frequency, convenience, quality)

Transit service can be improved by increasing the frequency of popular routes and keeping the mode of transport clean, safe, and reliable. The convenience of the service is also important to

increase usage, so providing multiple modes in one location increases the likelihood that people will utilize the transit service as opposed to their own vehicles.

5.6 Transit Prioritization (signal prioritization, HOV lanes)

Establish a set of criteria to determine the priority of certain transit projects and performance measures.

5.7 Transit Marketing, Promotion, and Pricing Incentives

Public travel patterns are affected by public knowledge and attitudes, so marketing is an important tool in order to increase transit usage. Instead of merely advertising its availability, transit marketing could be an ongoing dialogue between community partners and the transit sector. Employer-provided transit benefit programs can be an incentive for employees to find another way to work besides driving. This can be a tax-free benefit at low cost to the employer. Public transit can be made more affordable by offering other price incentives, such as group discounts or discounted pricing for multi-modal purchases.

5.8 Bike and Pedestrian Infrastructure

Improving, adding, and promoting sidewalks and bike lanes could increase the likelihood of commutes without the use of the personal vehicles. Adequate planning and continued maintenance are necessary to permit continued use of paths and trails.

5.9 Telecommute and Live-Near-Your-Work

Telecommuting and Live-Near-Your-Work are viable options for individuals that decrease or even eliminate daily commutes. Agencies or even employers may be able to assist employees in locating housing close to their jobs.

5.10 Car-Sharing Programs

A car-share program is likely going to be successful in larger metropolitan areas where public transit is highly used and readily available. People who normally take public transportation may not find a need to own a vehicle, but may occasionally need to use a personal vehicle. By implementing a car-sharing program, the types of cars, fuel economy, and type of fuel used can help to control emissions. Municipal or state agencies could lead by example and use car sharing for all or part of their fleets.

5.11 Commuter Choice/Parking Cash Out

Both California and the federal government have programs in place so that employees can “cash out” of their subsidized parking space and take public transit, carpool, walk, or bike to work. The value of the parking space can be given to the employee in terms of any incentive, such as flex or comp time, travel vouchers for public transportation, preference for use of dependant care facilities, etc.

5.12 "Pay-As-You-Drive" Auto Insurance

The state could authorize insurance companies to offer "Pay-As-You-Drive" (PAYD) auto coverage, under which a portion of auto insurance premiums are linked to miles driven (while the remaining portion remains a "fixed cost" as under current practice).

Pay-as-You-Drive Insurance has been promoted by a variety of groups for reasons that include emissions reduction and safety (through decreased driving), and fairness (by changing insurance costs to more closely track the portion of individuals' risk that is created by miles driven).

5.13 Road Pricing and User Fees

Toll pricing can encourage car-pooling, transit use, and travel during lower congestion periods.

5.14 Fuel Tax

Increasing the state tax on conventional fuels can reduce consumption and travel while encouraging the use of lower emissions vehicles, alternative fuels, and public transit.

5.15 VMT Tax

Similar concept to TLU-1.8. The state could implement a tax on the number of miles driven per year per vehicle. This would encourage people to drive fewer miles and take more public transportation.

TLU-6 MISCELLANEOUS

6.1 Aircraft Emissions

More efficient operation of aircraft could reduce GHG emissions. This would include idle time at the gate, on the runway, and research and development of pollution-reducing technologies.

6.2 Airport Operations and Ground Equipment

Airports could use low GHG airport equipment, possibly implementing the use of alternative fuels. This could also include better runway management.

6.3 Off-Road Vehicles (construction, recreational, etc.)

Off-road vehicles consist of construction vehicles, machinery used for mining and agriculture, recreational vehicles such as all-terrain vehicles, snowmobiles, jet skis, and boats. These off-road vehicles produce significant amounts of GHG emissions, however, numerous machines listed above last for many years. Incentives could be provided to companies and individuals to

encourage retrofits, alternative fuel use, and replacing old, highly polluting equipment with new equipment.

6.4 GHG Offset Purchase Options

This option would encourage consumers to offset the GHG emissions associated with their transportation purchases. Several services currently allow air travelers to offset their GHG emissions when purchasing a ticket; use of these services could be encouraged by providing kiosks at airports. Another option involves offering consumers the opportunity to offset GHG emissions when purchasing the new vehicle. GHG offsets could also be offered for purchase at fueling stations. Government could encourage the provision of GHG offset options through education and awareness campaigns, or could mandate the provision of offset opportunities at transportation retail locations.