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## **Brief Description of Transportation and Land Use Sector Catalog of State Policy Options**

**Prepared for Michigan Transportation and Land Use Sector TWG**

Call #1 – January 10, 2008

(Note that this listing is incomplete and will be developed further during the Technical Work Group (TWG) process. Additional details may be added to this document under each of the option descriptions, as they are developed.)

### **TLU-1 PASSENGER VEHICLE GHG EMISSION RATES**

#### **TLU-1.1 VEHICLE TECHNOLOGY**

##### **1.1.1 Tailpipe GHG Emission Standards: California Clean Car**

GHG tailpipe emissions standards are also known as the “Pavley” standards or the California Clean Car 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. The standards require manufacturers to meet a declining fleet-wide average standard for GHG emissions per mile.

##### **1.1.2 ZEV/LEV-2 Implementation**

California’s Low Emissions Vehicle (LEV) II regulations set fleet average emissions standards to be achieved by 2010 and establish testing procedures for vehicles. The program extends passenger car emissions standards to sport utility vehicles and pickup trucks and tightens overall emissions standards. The program regulates smog and ozone-forming air pollutants.



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LEV II requires manufacturers to produce a minimum percentage of Zero Emissions Vehicles (ZEV), or a commensurate amount of near-zero emissions vehicles, per year. These vehicle types include electric, hybrid-electric, and alternative fuel vehicles, which have lower GHG emissions than traditional vehicle types.

Other states have the option of adopting and implementing California's LEV II standards, which are stricter than federal emissions standards.

LEVII is aimed at criteria emissions, but could have some GHG benefits as well.

### **1.1.3 Fund R&D on Low-GHG Vehicle Technology (e.g., fuel cell)**

The state could support research and development of low-GHG vehicle technology to encourage technological innovation in the field.

### **1.1.4 Encourage/Mandate Add-on Technologies (Low Friction Oil, Low-Rolling Resistance Tires)**

Add-on technologies can be made to passenger vehicles to improve fuel efficiency, such as low friction oil or low-resistance tires (fuel efficient tires). Fuel-efficient tires may also be referred to as low rolling resistance tires. Fuel economy can be improved on light-duty vehicles by setting minimum energy efficiency standards for replacement tires. Typically, energy efficient tires are used on new models. But lower rolling resistant replacement tires may not be readily available to consumers and there is little information regarding the fuel economy of replacement tires.

### **1.1.5 Require Adoption of Hybrid Engine Buses**

Mandate that all new urban public transportation buses that are purchased be powered by a hybrid diesel-electric engine with a minimum average 50% fuel economy improvement over similar sized standard diesel engine buses.

### **1.1.6 Require GHG Emission Stickers for Automobile Sales**

Require that all new vehicles for sale in the state have a sticker providing vehicle-specific and average per vehicle class GHG emissions in grams of CO<sub>2</sub>-equivalent emissions per vehicle mile. The sticker will be displayed adjacent to the EPA miles per gallon sticker.



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### **1.1.7 Fund Infrastructure for Plug-in Hybrids**

## **TLU-1.2 VEHICLE OPERATION**

### **1.2.1 Enforce Speed Limits – Speed Cameras and Police**

Reduced vehicle speeds improve 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 and by enhanced police enforcement or speed camera installation. Significant enforcement resources may be needed for this measure to achieve the expected reductions.

### **1.2.2 Vehicle Maintenance, Tire Pressure Maintenance and Driver Training**

Better consumer information and education can lead to a gain in fuel efficiency. Consumer education could promote the use of “best in class” vehicle guides that provide comparative fuel efficiency information and could also provide associated vehicle GHG emissions. Drivers also need to be aware of maintenance issues that cause an increase in pollution and vehicle operating cost such as maintaining proper tire pressure. Additionally, education could be geared to encourage energy-efficient driving habits as well as encourage the use of alternative modes of transportation (e.g., how to use public transportation; how to commute to work by bike, etc.).

### **1.2.3 Transportation System Management (Intelligent Transportation Systems)**

Transportation system management improves vehicle flow on the roadway system, which can reduce fuel use and GHG emissions. Coordinated operation of the regional transportation network can improve system efficiency, reliability, and safety. Tools to reduce traffic congestion include HOV lanes, roundabouts at intersections, synchronized signals, incident management, variable message signs, and other forms of intelligent transportation systems (ITS).

### **1.2.4 Require Tune-up Services to Include Tire Pressure**

Require all tune-up and on demand oil change and engine check facilities to check tire pressure and inflate to the recommended pressure. This is a new regulation in California.



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### 1.2.5 Passenger Vehicle Anti-idling Program

### 1.2.6 School Education Programs

Require annual instruction yearly for grades 3 through 12 to educate students on the benefits of idling reduction and the consequences of not doing so. The curriculum will also address how students may broach this topic with parents or other drivers. A GHG curriculum could be developed for teachers to use at the elementary and secondary system levels. The curriculum can be included on a web site for statewide distribution. This can both disseminate current information through children to their parents and educate future drivers.

## TLU-1.3 INCENTIVES & DISINCENTIVES

### 1.3.1 Procurement of Efficient Fleet Vehicles

Governments can mandate or incentivize public and private vehicle fleets to include low-GHG vehicles, typically targeting a certain percentage of penetration within a certain period of time. Establish procurement policies (especially state lead-by-example) that select vehicles achieving best-in-class low greenhouse gas emissions, regardless of vehicle technology, where practicable (emergency vehicles exempted). Procurement policies should also assure that vehicles purchased are appropriate to intended use (e.g., passenger vehicles for transporting employees; light trucks only where needed for towing/hauling/off-road travel).

### 1.3.2 Feebates (state-specific or regional)

The state could adopt a variety of programs to move purchases of vehicles toward a lower-GHG fleet mix (including pure electric, hybrid, plug-in hybrid, and/or other alternative fuel vehicles). State incentives could include registration fees, feebates, and/or tax credits. “Feebates” would provide incentives for reduced GHG emissions by creating: (1) fees on relatively high emissions/lower fuel economy vehicles and (2) rebates or tax credits on low emissions/higher fuel economy vehicles.

Implement a sliding scale tax that would allow purchasers of low greenhouse gas emitting vehicles to earn a rebate on their vehicle registration or sales tax of up to X%, and purchasers of high greenhouse gas emitting vehicles to be assessed a vehicle registration or additional sales tax



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of up to X%. The sliding scale could be designed to be revenue-neutral, i.e. such that rebates are offset by fees assessed.

### 1.3.3 CO<sub>2</sub>-Based Registration Fees

The state could adopt a variety of programs to increase purchase of fuel-efficient or low-GHG vehicles (including pure electric, hybrid, plug-in hybrid, and other alternative fuel vehicles). State incentives could include registration fees, feebates, and/or tax credits. Higher vehicle registration fees can be charged for vehicles that have higher emissions, and/or vehicles that emit less could be charged a lower vehicle registration fee. Vehicle licensing fees could also be based up vehicle weight, with use of a dollar per vehicle-ton multiplier instead of the present broad categories of vehicle weight.

### 1.3.4 Tax Credits for Efficient Vehicles

The state could adopt a variety of programs to increase purchase of low-GHG vehicles (including pure electric, hybrid, plug-in hybrid, and other alternative fuel vehicles). State incentives could include tax credits. Tax credits can be offered for the first time purchase of a hybrid, alternative fuel vehicle, or other set of specifications that incorporate low-GHG emission standards. The state could also adopt other programs to more broadly promote flexible-fuel strategies to support a range of alternative vehicle types as opposed to those that currently operate on petroleum-based fuels.

Offer tax incentives for vehicles that achieve low greenhouse gas emissions. Offer a \$X,000 tax credit for any vehicle that achieves the equivalent or lower greenhouse gas emissions per mile of a high fuel economy vehicle (e.g., exceeds vehicle GHG emissions standards in 1.1.1 for a given model year by 20% or exceeds fuel economy of 30 mpg average of city/highway mileage for a light truck, 40 mpg for a passenger automobile).

### 1.3.5 Vehicle Scrappage

Emissions can be reduced from vehicles by developing and implementing an incentives program to accelerate the replacement and/or retirement of passenger vehicles with poor GHG emissions. Because of the energy input required for manufacture of new vehicles, keeping low-GHG emitters in the fleet longer will provide benefits if well maintained.



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### **1.3.6 Emission-Based Tolling (discount for clean/fuel efficient vehicles)**

An annual emission-rate based toll would be applied to vehicles based on their measured emission rates for CO<sub>2</sub> at inspection. More fuel efficient vehicles pay lower tolls than less fuel efficient vehicles.

## **TLU-1.4 FUEL MEASURES**

### **1.4.1 Pass Low-GHG Fuel Standard (e.g., renewable fuels)**

Legislate a standard for the carbon content of motor fuels, to be applied to fuel distributors. The standard would differ for gasoline and diesel, with E85 and biofuels to be included in the average for gasoline and diesel, respectively.

### **1.4.2 Purchase Low-GHG Fuel for State Fleets (e.g., CNG, biodiesel)**

Require that all state agencies purchase fuel with an average carbon content meeting a low GHG standard.

### **1.4.3 Subsidize Biofuel and Low-GHG Motor Fuel Usage (biodiesel, CNG, LPG, cellulosic ethanol)**

Provide a state motor fuel tax exemption or subsidy (tax credit) for the sale of biofuels and other low-GHG motor fuels.

### **1.4.4 Fund Alternative Fuel Infrastructure Development**

Provide facilities for low GHG alternative fuels at all rest areas and at least one fueling station per exit on limited access highways. The availability of low-GHG motor fuel pumps at private fueling stations shall be auctioned, with additional facilities able to opt-in at the same highest bid auction price.



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#### **1.4.5 Implement State Government E85 Use Plan**

Require that all state agencies purchase a set percentage of E85 fuel relative to gasoline usage.

#### **1.4.6 Build Electric Vehicle Charging Facilities at Selected Fueling Stations**

Provide facilities for plug-in hybrids to recharge, at a metered rate equal to the local market cost per kilowatt-hour for electricity, at all rest areas and at least one fueling station per exit on limited access highways. The availability of plug-in facilities at private fueling stations shall be auctioned, with additional facilities able to opt-in at the same highest bid auction price.

### **TLU-2 TRAVEL ACTIVITY PATTERNS**

#### **TLU-2.1 LAND USE AND LOCATION EFFICIENCY**

##### **2.1.1 Statewide Growth Management Plan**

Adopt statewide growth management plan and GHG cap guiding conforming regional transportation & land use plans/programs that meet state-determined GHG budgets and VMT per capita targets.

##### **2.1.2 Include GHG Evaluations in State Policies**

Ensure state policies and capital funding programs evaluate GHG implications to be a model for climate-friendly and energy efficient development patterns.

##### **2.1.3 Shape Investment to Maximize GHG Reductions**

Shape public and private investment to maximize GHG reductions and growth management, including Indirect Source Rule to hold development accountable for GHGs, Transfer of Development Rights, Open Space Protection, Coastal Zone Management, Adequate Public Facilities initiatives.



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#### **2.1.4 Provide Technical/Financial Support to Local Agencies**

Provide technical/financial support to local/regional agencies, enhancing technical tools, capacity, and fund Blueprint Planning Grant program.

#### **2.1.5 Tax and Building Code Reform**

Modify and fund reforms of state and local tax and zoning/building codes and policies to support GHG reductions and implementation of State growth plans.

#### **2.1.6 Ensure Michigan Congressional delegation works for Federal highway, transportation and land use related legislation/programs supporting timely climate change action**

### **TLU-2.2 INCREASING LOW-GHG TRAVEL OPTIONS**

#### **2.2.1 Make Full Use of CMAQ Funds – with application reviews considering GHG reductions**

Fully allocate all CMAQ funding / prioritize for GHG-reducing investments.

#### **2.2.2 Improve Transit Service (frequency, convenience, quality)**

Greater use of public transit and reduction in automobile travel can be achieved by improving existing transit service (e.g., expanded hours or coverage of bus service, higher frequency bus routes. This option also could include expansion of intercity bus service. Use of DOT data on travel origins and destinations could help determine if there are intercity regional routes that need prioritization.

#### **2.2.3 Transit Marketing and Promotion (including individualized transit marketing)**

Greater use of public transit and reduction in automobile travel can be achieved by enhanced promotion and marketing of transit, or through reduction in transit fares. Individualized transit marketing has proved to be highly effective in reducing auto trips through increased transit use.



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#### **2.2.4 Invest Additional Funds in Bike and Pedestrian Infrastructure**

Improving, adding, and promoting sidewalks and bikeways can increase pedestrian and bicycle travel and reduce automobile use. Infrastructure improvements could include bicycle parking and shower/locker amenities at places of employment. Local government “complete streets” policies would help to achieve these improvements.

#### **2.2.5 Expand Transit Infrastructure (rail, bus, BRT)**

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

#### **2.2.6 Convert/re-strip Current Lanes to HOV Lanes**

HOV Lanes can be added through new road capacity designated for HOVs or converting existing lanes. HOV lanes can be 24-hour or designated for peak hours only, and also employ reversible lane strategies. HOV programs are most successful as part of an integrated regional transportation strategy that includes other improvements and incentives for transit and rideshare use.

#### **2.2.7 Subsidize and Promote Car Pooling and Van Pooling**

Require free parking for car pools and van pools, to be funded by a state subsidy. Fund a promotional program advertising this program. Provide an additional direct subsidy to van pools (waived state fuel tax?) under a state program for registered services.

#### **2.2.8 Transit Prioritization (signal prioritization, Bus/HOV lanes)**

Improve transit travel time through prioritization measures such as signal prioritization or Bus/HOV lanes.

#### **2.2.9 Telecommute, Live-Near-Your-Work, and Tele-Education**

The state could encourage employers to provide options such as telecommuting to reduce automobile commutes. The telecommuting option includes the development and utilization of neighborhood telecommuting centers that offer office-type services in locations close to



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commuters' residences. As an incentive to develop and provide such services, a tax credit can be offered to companies. The state could also ensure adequate telecommunications infrastructure is in place to allow for telecommuting.

#### **2.2.10 Invest in/Provide Parking for Car sharing**

Car sharing provides financial incentives to minimize driving and encourages the use of alternative travel modes.

#### **2.2.11 Legislate Tax Policies to Promote E-Commerce**

Light-duty vehicle trip reductions can be achieved through the use of e-commerce instead of traditional means of shopping involving passenger vehicle travel.

#### **2.2.12 CO<sub>2</sub> Conformity Type**

Program capping CO<sub>2</sub> emissions in some form of a mobile budget.

#### **2.2.13 Provide Guaranteed Ride Home to transit users and car poolers**

Guaranteed ride home will serve as a "safety net" for commuters who would like to use transit services or carpool but are afraid they will not be able to get home in an emergency. It will reimburse for transit fare or taxi fare up to four times a year for registered participants.

#### **2.2.14 Provide Incentives to adopt "Best Workplaces for Commuters" standards**

Adopt the policies and programs as set forth by the EPA's Best Work Places Program to reduce VMT associated with daily work commutes. Provide a direct subsidy to employers per employee for adopting the full program. For more information, please visit: [www.bestworkplaces.org](http://www.bestworkplaces.org).

#### **2.2.15 Build park-and-ride facilities**

Build park-and-ride lots or lease space in existing commercial lots under-used during standard business hours to allow for park-and-ride. Conduct an appropriate promotional program.



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### **2.2.16 Adopt a statewide per-capita VMT goal**

If the region/ state doesn't hit the budget then transportation dollars swing from road construction to transit

## **TLU-2.3 INCENTIVE AND DISINCENTIVES**

### **2.3.1 Require Commuter Choice Measures/Parking Cash Out**

Commuter Choice Programs encourage employers to provide options such as telecommuting, transit subsidies, pre-tax transit fare program, parking cash-out, and guaranteed ride-home service in order to reduce automobile commutes. The telecommuting option includes the development and utilization of neighborhood telecommuting centers that offer office-type services in locations close to commuters' residences. As an incentive to develop and provide such services, a tax credit can be offered to companies. Government spending to encourage commuter choice can stimulate a large private-sector match (17 dollars of private incentives per dollar of public incentive, according to one source).

### **2.3.2 Implement a VMT Tax**

The state would charge a tax or fee reflective of miles traveled by passenger vehicles. In addition, revenues could be used to fund transit and other transportation alternatives within a corridor or region. Could be revenue neutral replacing fuel tax.

### **2.3.3 Pass Legislation Allowing Pay-as-You-Drive Insurance**

The state would encourage and support the provision of pay-as-you-drive auto insurance, possibly including state support for additional pilot programs.

### **2.3.4 Increased Fuel Tax (with targeted use of revenue towards travel alternatives)**

Increasing the state tax on conventional fuels can reduce consumption. In addition, revenues can be used to fund transit and other transportation alternatives within a corridor or region.



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### **2.3.5 Legislate Allowing for/Requiring Location-Efficient Mortgages**

The state could encourage and support mortgage providers to establish a lending program that reflects transportation cost savings of living near transportation oriented developments (from not owning or frequently using a car) in what potential homeowners can borrow.

### **2.3.6 Congestion Pricing (or tolls) (w/targeted use of revenue towards travel alternatives)**

Roadway tolling can be used to discourage single-occupant automobile use and provide revenue for alternative modes. If tolls or other user charges vary with congestion levels (congestion pricing), they can also be particularly effective at reducing congestion. Various forms of VMT-based user fees can also help to discourage unnecessary automobile use. Roadway pricing revenues can help fund needed highway improvements and help manage system-wide demand. In addition, pricing revenues can be used to fund transit and other transportation alternatives within a corridor or region.

### **2.3.7 Implement State-wide Parking Pricing, Excise Taxes, and/or Supply Restrictions**

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

### **2.3.8 Introduce Inter-city Highway Tolls**

Introduce tolls as federally-permitted on all inter-city limited access highways. Such tolls should be equivalent to one and one-half cents per mile. Tolls should be rounded appropriately and collected only periodically to reduce toll collection costs and reduce driver inconvenience, and implemented with electronic collection as possible.



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### **2.3.9 Introduce Transit Pricing Incentives**

This option would include various incentives that give discretionary travelers reasons to choose transit. This could include reduced fares (for populations, like seniors, or time-based, such as off-peak) or offer discounts

### **2.3.10 Make VMT/GHG Offset Requirements for Large Developments**

This option would require the identification of GHG emissions and mitigation measures as part of the environmental review process for large developments. In all levels of environmental review, the party charged with assessing the potential for substantial adverse environmental impacts should be required to inventory the changes to greenhouse gas emissions that will result from the project or plan and identify strategies that will be undertaken to offset all net new emissions or to help meet state or regional emission goals. Emissions from automobiles, freight trucks, and heavy machinery during development can be offset by a plan that reduces emissions. These offsets can include preserving open spaces and converting to alternative fuel energy sources, for example. Additionally, mitigation requirements could involve the use of a one-to-one VMT reduction measure for large developments, whereby developers would be required to invest in strategies that would reduce VMT by the amount expected to be created by a large new development.

### **2.3.11 Benefits for Low GHG Vehicles (preferential parking, use of HOV lanes)**

Incentives can be offered to drivers of low-GHG vehicles. Depending on effectiveness, these could include preferential vehicle access to metered parking spaces or HOV lines.

## **TLU-3 FREIGHT**

### **TLU-3.1 VEHICLE TECHNOLOGY**

#### **3.1.1 Subsidize/Provide Loans for Vehicle Technology Improvements (e.g., aerodynamics)**

The fuel efficiency of freight trucks can be improved using a variety of equipment modifications (e.g., aerodynamic devices, wide-base tires, fuel efficient lubricants) as well as driver training. Government agencies can promote truck fuel efficiency improvements with incentives and outreach.



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### 3.1.2 Fund R&D on Low-GHG Vehicle Technology

The state could support research and development of low-GHG vehicle technology to encourage technological innovation in the field.

### 3.1.3 Mandate Black Carbon Control Technologies (e.g., use of particulate traps, other complementary technologies)

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

### 3.1.4 Facilitate Adoption of New Clean Technologies – Rail and Marine Engines

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

## TLU-3.2 VEHICLE OPERATION

### 3.2.1 Fund Freight Logistics Improvements/GIS

Trucking operations suffer from inefficiencies that increase fuel consumption. Inefficiencies include idling unnecessarily, using longer or more congested routes, and hauling empty trailers. Improvements in freight logistics can reduce these inefficiencies. Systems including websites and advanced software packages can help with load matching and route and schedule optimization.

### 3.2.2 Enforce Speed Limits

Reduced vehicle speeds improve fuel economy, reduce CO<sub>2</sub> emissions, and improve safety. Significant enforcement resources may be needed for this measure to achieve the expected reductions.



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### **3.2.3 Improve Traffic Flow through Bottleneck Improvements**

Improving vehicle flow on the roadway system can reduce fuel use and GHG emissions by freight vehicles. Coordinated operation of the regional transportation network can improve system efficiency, reliability, and safety.

### **3.2.4 Allow Increased Size and Weight of Trucks**

Larger trucks take advantage of economies of scale to haul more freight with a proportionally smaller increase in fuel consumption. Increasing the size and weight of trucks also raises safety concerns and may create compatibility problems with intermodal transportation. May cause shift from rail to trucks.

### **3.2.5 Pre-Clearance at Scale Houses**

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

### **3.2.6 Truck Stop Electrification to Reduce Idling**

Reduce idling-induced emissions from heavy-duty diesel trucks by providing electrical hook-ups to power heating, cooling, and other needs while stopped.

### **3.2.7 Enforce Anti-Idling Ordinances**

Vehicle idling can be reduced by enforcing anti-idling ordinances and/or encouraging the use of alternatives. Many states and local governments have adopted idling regulations for trucks and buses. Alternatives to long-term truck idling include the use of technologies such as automatic engine shut down/start-up system controls, direct-fired heaters, auxiliary power units, and truck stop electrification. Idling reductions could also be considered for other vehicle types and fleets.

## **TLU-3.3 INCREASING LOW-GHG TRAVEL OPTIONS**

### **3.3.1 Fund Intermodal Freight Initiatives**

This option focuses on the improvements to railroad infrastructure and other strategies to encourage more use of freight rail. For example, transport of freight can be shifted from the



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roadway system to rail. In many cases, carrying freight by railroads rather than truck can reduce emissions and fuel consumption while reducing congestion on major roadways.

### **3.3.2 Develop Port/Terminal Facilities for Feeder Barge Container Service**

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

### **3.3.3 Increase Rail Capacity, and Address Rail Freight System Bottlenecks**

Increasing rail capacity allows the possibility of shifting more freight to rail from trucks.

## **TLU-3.4 INCENTIVES & DISINCENTIVES**

### **3.4.1 Require Procurement of Efficient Fleet Vehicles (public, private or other)**

This option would provide incentives for or discounts to transit agencies and for other fleet vehicles for the purchase of hybrid and/or other cleaner-technology vehicles.

### **3.4.2 Provide Incentives to Retire or Improve Older, Less Efficient Vehicles**

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

### **3.4.3 Provide Maintenance and Driver Training**

Better driver information and education can lead to a gain in fuel efficiency. Drivers also need to be aware of maintenance issues that cause an increase in pollution and vehicle operating cost. Additionally, education could be geared to encourage energy-efficient driving habits, such as speed control, as well as encourage reductions in idling.



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### **3.4.4 Increased Emission-Based Truck Tolls or Highway User Fees**

Roadway tolling can be used to provide revenue for alternative modes. Roadway pricing revenues can help fund needed highway improvements and help manage system-wide demand. In addition, pricing revenues can be used to fund transit and other transportation alternatives within a corridor or region.

## **TLU-4 INTERCITY TRAVEL: AVIATION, HIGH SPEED RAIL, BUS**

### **4.1 Invest in High-Speed Rail**

Intercity rail provides express train passenger services covering longer distances than commuter trains, which can reduce automobile use and possibly aircraft activity.

### **4.2 Improve Integrated Aviation, Rail, Bus Networks (planning, governance, and investment)**

Encourage transportation infrastructure between cities to support connectivity of alternative transportation modes.

### **4.3 Tighten Standards for Aircraft Emissions**

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

### **4.4 Tighten Standards for Airport Ground Equipment**

Airports can reduce emissions from ground support equipment by using alternative fuels and electrification of gates. This option could also include better runway management.

### **4.5 Provide Incentives for Intercity Bus Service**



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## **TLU-5 OFF-ROAD VEHICLES (CONSTRUCTION EQUIPMENT, OUT-BOARD MOTORS, ATVS, ETC.)**

### **5.1 Incentives for Purchase of Efficient Vehicles/Equipment**

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

### **5.2 Fund Improved Operations, Operator Training**

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

### **5.3 Require Maintenance Improvements**

By ensuring vehicles are well-maintained, fuel efficiency and emissions benefits can be achieved.

### **5.4 Mandate Increased use of Alternative Fuels or Low Sulfur Diesel**

This option seeks to reduce GHG emissions by increasing the availability and usage of alternative fuels and low sulfur diesel for off-road vehicles.

### **5.5 Introduce Locomotive Idling Reductions**

Introduce regulations on the limit of time that line-haul and switch-yard locomotives are permitted to idle when stationary.



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### **5.6 Adopt Green Port Strategy (Port Land-Side: Clean-up Port Dwelling and Cargo Handling Equipment Operations)**

There are ports on the west coast (Los Angeles, for example) that have adopted measures to introduce less polluting, more energy efficient technologies for vessel dwelling and for land-side cargo handling equipment that could be adopted.