



**Asia-Pacific
Economic Cooperation**

**APEC Cooperative Energy Efficiency Design for
Sustainability (CEEDS)
FINAL REPORT FOR CEEDS PHASE 3:
Energy Efficient Urban Passenger Transportation**

**Workshop #1:
14-16 September 2011
San Francisco, USA**

**Workshop #2:
17-19 January 2012
Singapore**

Apec Energy Working Group

April 2012



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(CEEDS)

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APEC Project EWG 03/2011A

Produced by

Asia Pacific Energy Research Centre (APERC)
Inui Building Kachidoki 11F, 1-13-1 Kachidoki
Cho-ku, Tokyo 104-0054, Japan
Tel: (81) 3-5144-8551
Fax: (81) 3-5144-8555
Email: master@aperc.iecej.or.jp
Website: <http://www.iecej.or.jp/aperc/>

In consultation with
Alliance to Save Energy (ASE)
1850 M Street, NW, Suite 600
Washington, DC 20036, USA
Tel: (1) 202.857.0666
Fax: (1) 202.331.9588
Email: info@ase.org
Website: www.ase.org

For

Asia Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@appec.org
Website: www.appec.org

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Asia-Pacific Economic Cooperation

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Executive Summary

Background on CEEDS. Phase 3 of the APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) project focused on energy-efficient urban passenger transportation. The project was organized by the Asia Pacific Economic Research Centre (APERC) with METI, Japan, as the Project Overseer. Like the APEC Peer Review on Energy Efficiency, CEEDS Phase 3 was co-sponsored by all EWG Economies. Previous phases of CEEDS addressed appliance energy standards and labeling (Phase 1) and building energy codes (Phase 2). All three topics are among the high-performance policies identified as having the potential to help APEC economies achieve the energy savings goals adopted by APEC leaders.

For each phase of CEEDS, APEC economies are invited to participate in a series of two workshops. At the first workshop, each economy draws on a policy template provided by APERC to identify the current status of policies and programs, along with barriers and possible solutions to advancing programs and policies in the sector of focus. Comments by invited international experts and from the other participating economies help the delegates from each economy identify proposed next steps. After the first workshop, each delegate shares the workshop findings and proposed next steps with colleagues in the relevant ministries and agencies of their economy. At a second, follow-on workshop (3-4 months after the first), the representatives from each economy report back on progress in implementing the planned actions and any new issues or opportunities identified. Discussions among the economies and invited experts help each economy develop a “fine-tuned” plan of action or roadmap for implementing the policies and programs discussed during the two workshops.

CEEDS Phase 3 Policy Template. The Alliance to Save Energy (ASE), with support from the Policy and International office of the US Department of Energy and the US Department of Transportation, assisted APERC in preparing a policy template for energy efficient urban passenger transport as background material for the economies participating in CEEDS Phase 3.¹ This template is designed to provide guidance to policymakers and program managers in APEC economies on options to significantly improve the efficiency of the energy use associated with passenger transportation, particularly in urban areas. The document focuses on livable communities and transit-oriented development (TOD), mass transit options—particularly bus rapid transit (BRT)—as a core component of TOD, and energy efficient vehicles.

¹ “APERC Policy Template on Energy Efficient Transportation 080811 FINAL”

CEEDS Phase 3 Workshops. The first CEEDS Phase 3 workshop on energy efficient urban passenger transportation was held in San Francisco, California, USA, on 14-16 September 2011, in conjunction with the APEC Senior Officials' Meetings (SOM). The workshop was organized by APERC and co-hosted by the United States and Singapore, the agenda for "CEEDS Workshop #1" is shown in Appendix 1a. The second workshop of CEEDS Phase 3 was held in Singapore on 17-19 January 2012; the agenda for "CEEDS Workshop #2 is shown in Appendix 1b.

Five economies participated in each of the CEEDS Phase 3 workshops.² Participants in the first workshop included delegates from the People's Republic of China, Mexico, the Philippines, and Thailand and Viet Nam. Mexico was unable to participate in the second workshop, but delegates from Indonesia participated, keeping the total number of represented economies at five. International transportation sector experts from several other APEC economies—Japan, New Zealand, Singapore, the United States, and—provided presentations on the implementation of efficient transportation policies and programs in their economies and around the world. Together, more than sixty people attended one or both of the CEEDS Phase 3 workshops, including the APEC economy delegates, invited international experts on various aspects of energy efficient transportation, representatives of the two host economies (United States and Singapore), Alliance to Save Energy experts, other interested APEC delegates attending the SOM in San Francisco, and the APERC researchers and administrative staff.

Discussion at the two meetings focused on:

- The importance of energy efficient transportation as a cornerstone strategy for achieving significant energy savings to meet APEC energy efficiency goals, as well as to achieve numerous co-benefits (e.g., reduced congestion, increased mobility and safety, health benefits) in developing APEC economies;
- The large energy savings potential of efficient urban design—and the danger of continuing with business as usual growth patterns, since decisions made today about urban design will impact our cities' energy use for decades to come;
- The current status of efficient transportation programs and planning in each of the participating economies;

² Participating economies in the first workshop were the People's Republic of China, Mexico, the Philippines, Viet Nam, and Thailand. Economies participating in the second workshop were the People's Republic of China, the Philippines, Viet Nam, Thailand, and Indonesia.

- Effective strategies for developing and strengthening efficient urban passenger transportation programs—with a focus on transit-oriented development and livable communities, transit planning (especially bus rapid transit), and strategies for improving vehicle fuel economy (including electric vehicle technology)—based on an exchange of information among the delegates and experience offered by the invited expert speakers from other economies; and
- Status reports and proposals on the next steps to be pursued by each participating economy to advance efficient urban passenger transportation.

Key Takeaways: Over the course of the two workshops, the participants discussed examples and elements of effective policies in APEC economies. The key takeaways of these discussions are summarized below.

Economies can use the ‘Avoid-Shift-Improve’ framework to effectively improve the efficiency of transportation systems by pursuing three simultaneous goals:

1. *Avoiding* or reducing the need to travel or use motorized vehicles, e.g., through the integration of land use and transportation planning (e.g., transit oriented development (TOD)).
 - Key principles for effective TOD include planning for mixed urban uses; providing and promoting convenient mass transit options; maximizing intermodal connectivity of transit hubs; charging for vehicles coming into cities; and developing bicycle networks and neighborhoods that promote walking. Other proven practices include changing zoning laws around mass transit stations and transforming underused/badly designed areas in cities into more attractive, vibrant urban areas. The workshop discussions also highlighted the need to create dense networks of streets and paths, use smaller city blocks, and regulate parking and road use.
 - There is potential in many cities to achieve 50% energy savings (compared to projected baselines) by maintaining or increasing population density. An APERC study showed that urban density in most APEC cities is declining, leading to an expected rise in energy use per capita. The largest potential for reducing future transportation-related energy use is through designing for better urban growth.
2. *Shifting* to more energy efficient modes of travel, e.g., by improving and promoting the use of public transit systems (e.g., bus rapid transit (BRT)) and encouraging the use of non-motorized transport.

- Factors to consider when choosing among transit modes include land use factors, demand for transit service, system design, capital and operating budgets, greenhouse gas reduction potential, and costs (both public and private).
 - BRT can be very cost-effective and quick to deploy and, compared to heavy rail, can achieve much greater service/area coverage for the same cost. Important elements of BRT include running ways, stations, vehicles, fare collection, intelligent transportation systems (ITS), service and operating plans, and branding. Best practices for BRT include median-aligned bus lanes, dedicated lanes, off-board fare collection, wide doors and level boarding, and weather protected stations. It is also important to integrate BRT systems with bike paths and bike sharing programs.
 - People's travel behavior can be influenced by: Increasing residential and employment density; diversifying land uses; designing the built environment so that it has interconnected and varied spaces; ensuring destination accessibility; and keeping most density within a quarter mile from the transit station.
3. *Improving* vehicle and fuel technologies in order to reduce the impact of each kilometer travelled (e.g., through fuel efficiency standards and promoting electric vehicle use and infrastructure development).
- Fuel economy standards are one of the most effective tools for increasing the efficiency of road vehicles. They should apply to all major vehicles, be based on size (rather than weight), and be coupled with incentivizing policies. Adopting fuel quality standards (e.g., Euro4) can also significantly increase overall vehicle efficiency.
 - In addition to regulation, measures to include road vehicle efficiency include fiscal incentives (e.g., tax incentives for buying efficient vehicles, penalties for less efficient vehicles, and phasing out fuel subsidies) and technological options:
 - Available today: Engine, transmission, road load improvements
 - Mid-term options: Increase in hybrid vehicles
 - Long-term options: Electric drive vehicles
 - Used car markets in developing economies are a particularly difficult issue, since many of these economies have no regulations regarding imported vehicles. Control options for the used car market include requiring inspection/maintenance tests at the border, prohibiting imports or exports of used vehicles, restricting the age of used imports, and requiring higher taxes on high-polluting vehicles. Another option is to educate consumers through vehicle labels that include fuel consumption information and a comparative rating.

- Overall efficiency of road vehicles can also be increased through congestion controls to reduce the volume of traffic entering the central business district. As Singapore has shown, these can consist of both ownership controls (e.g., quota systems and fees/taxes to deter car ownership) and measures on the user side (e.g., Area Licensing Schemes, Electronic Road Pricing schemes).
- There have been substantial investments and progress with electric vehicles (EVs), but the timing and extent of their market penetration will depend on storage technology advancements and cost reductions. Two of the possible pathways to future EV development are:
 - *Top down*: Building full size, fully functional vehicles that compete with conventional vehicles.
 - *Bottom up*: Building small, inexpensive EVs (including e-bikes) and neighborhood electric cars.

To ensure success of new policies and programs, it is important to include the following elements in program design:

- Specific short (1 year), medium, and long-term (up to 5-10 year) goals with realistic timelines and measurable targets.
- Data collection plans to enable the creation of baselines and documentation of progress.
- A system for measuring and reporting progress toward goals—with clear assignment of reporting responsibility.
- Financing plans that are based on cost-benefit analysis to help justify investments, and the use of innovative financing mechanisms—such as ESCOs, performance based contracts, and joint development financing (e.g., two different departments, developer/agency/bank).
- Inter-Ministerial cooperation and collaboration between central and local government agencies
- Public information campaigns that raise awareness of the benefits of public transport and create a sense of urgency (e.g., by providing information about traffic safety or energy security).

Main Challenges: The workshop participants identified the main challenges related to efficient urban passenger transportation systems that developing APEC economies face. The most significant specific challenges for each of the participating APEC economies are described in the workshop presentations (available at <http://www.iej.or.jp/aperc/>) and summarized in Appendices 2-7; however, the most common challenges included:

- Urban traffic congestion, resulting in limited mobility, traffic accidents, and pollution

- Congested and inadequate bus and rail systems
- Lack of traffic infrastructure and facilities
- Proliferation of unregistered, unregulated transit operators (e.g., buses, jeepneys) and motorbikes for personal transport
- Lack of government capacity to implement EE transport policies and regulations
- Population movements out of cities that result in long commutes
- Unregulated and inefficient used vehicle imports

The “fine-tuned” proposals developed by the APEC economy delegates during the CEEDS3 workshops suggest policies and programs designed to address these challenges. These proposals are provided in Appendices 2-7, along with key points from the discussion of the proposals at the second workshop.

Why Focus on Energy Efficient Urban Passenger Transport?

Urban passenger transportation represents an important area of focus for economy-wide policy, for numerous reasons:

- **Mobility and Safety.** The APERC analysis presented at the second CEEDS Phase 3 workshop showed that the urban population in the APEC region is increasing, particularly in developing economies. By 2025, more than half of the population in the developing world will be living in cities. This trend, combined with the projected increase in the number of private motorized vehicles, will significantly exacerbate the traffic congestion that is already creating mobility and safety issues in urban areas. APERC estimates that car ownership in the APEC region will triple by 2020, resulting in an 80% increase in road fatalities in low/mid-income economies. Increasing the efficiency of urban transportation can significantly reduce traffic congestion and improve road safety.
- **Public Health.** Transport is responsible for up to 80% of local air pollution in developing economy cities. Mitigating air pollution through improvements in transport efficiency can thus have significant health benefits for urban populations. Other mental and physical health benefits also have been connected to traffic and pollution reduction (e.g., through increased exercise as a result of access to safe and well-connected pedestrian and bicycle routes).
- **Energy Security.** In 2008 the transportation sector accounted for 27% of energy use in APEC economies; 93% of this energy was from crude oil and petroleum. Vehicle energy use is expected to increase 250% in APEC economies such as China, Vietnam, and Indonesia by

2035. Rising energy prices and access to oil supply thus raise concerns about economies' ability to meet transport energy needs, as well as general issues of energy security and economic competitiveness. Diversifying and offering efficient public transportation options gives people alternatives to private vehicle use. Taking private motorized vehicles off the road can improve energy security by reducing energy demand and dependence on oil.

- **Greenhouse Gas (GHG) Emissions.** Almost a quarter of global CO₂ emissions from fuel combustion are transport related, and the APERC analysis presented at the CEEDS meetings projected that CO₂ emissions from transport will increase 300% by 2050. Policies focused on curbing energy use in transportation can be integrated with economy-wide climate change mitigation goals and plans, such as nationally appropriate mitigation actions (NAMAs).
- **Costs of Urban Infrastructure.** Transport accounts for a large and expanding share of urban infrastructure costs. Developing economies have the opportunity to “leapfrog” the development trajectories of more developed economies by utilizing lessons learned from around the world to design sustainable transport policies and infrastructure at lower costs. Cost savings are also possible through the use of road pricing policies to curb private motorized vehicle use or monetize some of the externalities caused by congestion.

Finally, energy-efficient transportation policies promoting public transportation provide people, especially low income groups, access to transit and larger job centers. Such policies can thus help reduce poverty, and can increase social equity and economic mobility.

Assess Policy Instruments and Choose an Appropriate Path

When considering transportation-related policy options, policymakers have to balance project timeframes and levels of investment with the expected short and long-term benefits. One framework for considering various options—developed by Dalkmann and Brannigan (2007) and adopted by numerous international bodies—is called ‘Avoid-Shift-Improve,’ which consists of three simultaneous goals:

- *Avoiding* or reducing the need to travel or use motorized vehicles, e.g., through the integration of land use and transportation planning;
- *Shifting* to more energy efficient modes of travel, e.g., by improving and promoting the use of public transit systems and encouraging the use of non-motorized transport; and
- *Improving* vehicle and fuel technologies in order to reduce the impact of each kilometer travelled.

Create Livable Communities and Promote Transit-Oriented Development (“Avoid”)

One key strategy for avoiding or reducing the need to travel or use motorized vehicles is to adopt policies and programs that promote *livable communities* and *transit-oriented development* (TOD). In areas well served by public transportation systems, well-designed land use policies can help create high-density, mixed-use zones that combine business and housing, making it easy for people to commute and meet their commercial and social needs using public transportation or by walking or bicycling. Strategies for TOD and creating livable communities include:

- Designing zoning regulations to encourage mixed residential and commercial development.
- Providing adequate pedestrian paths/sidewalks and bicycle lanes to facilitate non-motorized transport between home, work, shopping and dining.
- Reducing the need for motorized travel by creating urban landscapes that offer a variety of amenities and community activities within walking or biking distances of each other.
- Building new communities around mass transit nodes and offering complementary and interconnecting transportation options such as pedestrian footpaths and bikeways, bus rapid transit, light rail, subways, and street cars.
- Increasing the density and land use mix surrounding mass transit options, to maximize space as well as proximity of people to amenities, and to reduce dependence on private vehicle use.

Although implementing comprehensive TOD may be easiest when planning a new community, TOD strategies also can be employed in existing neighborhoods by changing zoning regulations to encourage mixed development, creating separate TOD districts, and adding pedestrian paths and bicycle lanes between business and residential districts and/or between these areas and public transportation.

TOD and planning livable communities not only improve transportation energy efficiency and reduce pollution and greenhouse gas emissions; they can also spur economic development and improve the quality of urban life.

Promote More Energy Efficient Modes of Travel (“Shift”)

Opportunities to ‘shift’ people to using more energy efficient modes of travel include encouraging the use of non-motorized transport and carpooling, and improving and promoting the use of public transit systems.

- ***Non-Motorized Transport: Walking, Bicycling, and Bicycle Sharing:*** Encouraging people to walk or ride bicycles rather than use motorized transport can reduce a city’s transportation-related energy consumption and result in significant co-benefits. One option for encouraging such behavior changes is to create *bicycle sharing programs*. Bicycle stations can be strategically located throughout an urban area based on demand volume as well as proximity to destination sites. Users usually pay a small fee to use a bike for a short period and bicycles can be returned to any station. Pricing is an important factor in system design: The fee for renting a bike should be lower than the cost of alternative forms of transit. A private company or government agency can manage and own the bicycles; many established bicycling programs are managed through public-private partnerships. Local governments can also support bicycle sharing programs by facilitating permitting for bike stations.
- ***Reducing Motorized Trips: Carpooling and Car Sharing:*** Carpooling and car sharing programs allow for private vehicle use, but focus on reducing vehicle trips by increasing the number of passengers in the average car or eliminating incentives for individual car ownership. Designating carpool (or high occupancy vehicle, HOV) lanes on major roads reduces the total number of cars on the road, and rewards HOV users with significant time savings through use of dedicated lanes. Car sharing programs reduce the need for individual car ownership by making cars available to members on an as-needed basis. Cars can be rented for short time intervals (e.g., by the hour) without administrative paperwork, and are distributed in various locations convenient to program members. As with bicycle sharing, municipal governments can promote car sharing programs by facilitating the permitting process for the stations/parking areas, and by considering partnerships with private sector companies to manage these programs.
- ***Mass Transit:*** Public or mass transit options—e.g., light rail, bus rapid transit (BRT), city buses, and subways—offer a variety of benefits: They give people an alternative to driving, save energy because they transport more people at once (so the passenger-to-fuel consumption ratio is lower), and reduce traffic congestion and pollution.
 - BRT uses buses to provide faster, more efficient service than ordinary bus lines by offering improvements in infrastructure, vehicles, and scheduling; light rail requires more built infrastructure than bus systems and usually operates on electric rails. Both systems may operate in mixed traffic on city streets, or may use dedicated lanes.
 - Subway systems have a higher carrying capacity than both BRT and light rail and can travel at faster speeds, but often require more financial investment as well as longer and more complex construction.

As highlighted during the CEEDS meeting discussions, performance contracting is a viable strategy for financing the development of BRT systems; Bogota, Colombia and Guangzhou,

China are both successful examples. Multiple public transport companies can compete to win contracts to provide service on a system – or even for a fixed corridor – and can be required to meet specific service standards.

Additional Measures to Promote Mode-Shifting Behavior

In addition to those listed above, strategies to promote mode-shifting behavior include:

- **Urban design.** Designing urban areas around well marked pedestrian paths/sidewalks, pedestrian zones, and bicycle lanes, and providing adequate street lighting to expand pedestrian access and enhance security, will promote higher pedestrian traffic.
- **Vehicle fuel subsidy reductions.** Reducing or eliminating subsidies requires consumers to pay the market price for fuel, encouraging owners of private motorized vehicles to drive less and to seek alternative (less expensive) modes of transport.
- **Market-based disincentives.** Several options exist for discouraging private car use using financial disincentives. *Congestion pricing* and *road pricing* strategies enable governments to target private vehicle drivers and charge them fees, often based on distance driven or time of day. Both types of schemes require financial, demographic, and social analysis to develop fee systems that accurately charge users for their environmental impacts, and to develop effective compliance mechanisms.

Increase Energy Efficiency of Vehicles (“Improve”)

Policies to promote improvements in fuel economy: Approaches for improving the fuel economy of new vehicles include fuel economy standards and/or emissions standards, development of efficiency vehicle technologies, and monetary policies to incentivize improvements in fuel economy.

- **Fuel Economy Standards:** Adopting and enforcing fuel economy standards is a common policy instrument for improving fuel efficiency, particularly of new vehicles, and arguably the most effective option at the central government level. Manufacturers have expressed concern about the difficulty of compliance with standards and testing procedures that vary among economies. The International Energy Agency (IEA) encourages economies to harmonize standards in order to improve the accuracy of test procedures and reduce manufacturers’ costs for meeting the various requirements. Governments have been working with manufacturers to determine the most effective way to index fuel economy standards. Japan, Korea, the EU, and China index fuel efficiency standards to vehicle mass. The U.S.

has adopted new standards indexed to a vehicle's "footprint," grouping cars by the square footage of the wheelbase; and Canada is phasing in similar standards.

- **GHG Emissions Standards:** While APEC economies with major automobile manufacturing industries often focus on fuel economy standards as a way of regulating vehicle efficiency, similar results may be achievable by regulating vehicle emissions or setting GHG performance standards. Requiring regular vehicle emissions and safety inspections ensures that all legally operating vehicles meet established emissions standards and will discourage the importation of old, inefficient vehicles and parts. GHG performance standards incentivize such improvements as using less GHG-intensive air conditioning systems and using more efficient auxiliary systems (e.g., LED headlights).
- **Feebates:** A feebate provides a rebate to buyers of efficient vehicles and charges a fee to those buying less efficient vehicles. Changing the initial purchase price has a larger impact on customer decisions than monetary savings from higher fuel economy that accrue over time. Feebates provide manufacturers with a continuing incentive to improve fuel economy, in contrast to regulatory standards which offer no incentive for improvement once standards are met.
- **Fuel Taxes:** Many economists argue that the most efficient way to raise fuel economy and reduce GHG emissions is by raising fuel taxes. When the price of gasoline is low and does not reflect its overall environmental effects, consumers have less incentive to purchase fuel-efficient vehicles. Increasing gas prices raise the demand for fuel-efficient cars, which encourages manufacturers to improve fuel economy; in addition, when fuel prices are high customers are more willing to pay a higher price for more efficient cars.
- **Controlling Imports:** Economies that import large numbers of used vehicles have several choices for improving the efficiency of these imports. These include requiring inspection/maintenance tests at the border, restricting the age of used imports, and requiring higher taxes on high-polluting vehicles. Another option (successfully implemented in New Zealand) is to educate consumers through vehicle labels that include fuel consumption information and a comparative rating. Regional cooperation on this issue may be possible for certain vehicle classes.
- **Other Strategies:** Other options to improve fuel economy include providing consumers with information to make better choices when purchasing new cars through the use of efficiency labels, and incentivizing early retirement of inefficient cars. Programs to ensure more efficient driving of cars already on the road—e.g., enforcing lower speed limits, providing eco-driving training, and developing low-resistance road surfaces—also can improve actual fuel economy.

Technology Innovations for Private Motorized Vehicles: Many technological options exist to improve the energy efficiency of individual vehicles:

- **Fuel economy** can be improved by increasing efficiency of the engine and transmission or by decreasing the amount of energy needed to move the vehicle (e.g., by reducing weight, rolling resistance, and dynamic drag). Approximately 20% of a vehicle's fuel is used to overcome rolling resistance of the tires; significant fuel consumption savings are possible through the use of low rolling resistance tires.
- **Electrically Powered Vehicles:**³ Types of electrically powered vehicles include electric drive vehicles (EVs), hybrid-electric vehicles, and plug-in hybrid electric vehicle (PHEVs). EVs can be directly powered from an external power station, by stored electricity (batteries), and by on-board electrical generators (e.g., fuel cells). Hybrid-electric vehicles run on gasoline, using an electric motor in conjunction with a petroleum-fueled internal combustion engine. PHEVs uses rechargeable batteries (or other energy storage devices), that can be restored to full charge by connecting a plug to an external electric power source, such as an electric wall socket. Electric cars are projected to make up about 35% of the car market by 2025. Use of other types of electric vehicles (e.g., buses, e-bikes) is also increasing in some APEC economies.

Improving the Efficiency of Transport Service Fleets: There are numerous types of service vehicles—e.g., small buses, vans, private cars for hire, motorcycles with passenger cars, jeepneys, auto rickshaws, and tuk-tuks—that operate outside of the formal public transport system. In many emerging APEC economies, these vehicles often proliferate in the absence of reliable and organized public transport systems. This segment of the transportation sector, which is often characterized by the use of older, inefficient vehicle models, may not fall under the same regulations of private vehicle owners and may require a different set of efficient transportation policies. Some options that have been suggested for reducing the impacts from this sector include:

- *Formalize the sector.* Many for-hire vehicles are independently owned, thus fragmented, making it harder to regulate activity.
- *Regulate numbers.* Cap the number of for-hire private vehicle permits to reduce congestion.
- *Institutionalize an inspection/maintenance system.* Categorize for-hire vehicles of all sizes and require them to meet efficiency standards.

³ Electrically powered vehicles reduce gasoline/petroleum usage, but their overall impact on reducing energy use and GHG emissions will depend on how the electricity is generated.

Opportunities for Regional Collaboration

The CEEDS Phase 3 participants discussed numerous suggestions for further regional collaboration to improve the energy efficiency of the passenger transport sector in the APEC region. These included:

1. ***Ongoing collaboration and knowledge sharing among the CEEDS 3 participants***, through the coordination of APERC. Ideas included creating an online system with a comprehensive checklist of transport-related goals and activities that the participating economies could periodically update; such a system would need member economy approval.
2. Collaboration through the ***Energy Efficient Urban Transport Network, under the APEC Energy Smart Communities Initiative (ESCI)***. The goal of the Network is to compile examples of energy-efficient urban transport, with documentation of cost, energy and carbon reduction. Economies that have joined the network to date include Australia, Canada, Indonesia, Singapore, Chinese Taipei, and the United States. Participation by the CEEDS 3 economies (People's Republic of China, Philippines, Thailand, Viet Nam, Mexico, and Indonesia) would add significant value to the Network and also would provide a ready vehicle for dissemination of the results of these economies' activities related to CEEDS.
3. Tying further transportation sector cooperation to the ongoing ***APEC Low-Carbon Model Town- (LCMT) project***, ensuring that the experience of the LCTs is disseminated through the APERC website with link to KSP. to the economies interested in their transportation aspects.
4. Collaboration on new regional ***Sustainable Transport Initiatives with support from the Asian Development Bank (ADB)***. ADB is seeking strong pipelines of projects, so the economies could collaborate to convert their ideas into project proposals that are technically and economically sound, and socially inclusive.
5. Carrying out ***APEC-funded projects*** jointly through the Transportation and Energy Working Groups.
6. Contributing to the ***APEC Task on Smart Transport: Energy Efficient Urban Transport Network*** by joining the network and contributing examples of energy-efficient urban transport (including documentation of cost, energy and carbon reductions).
7. Collaboration to provide unified regional inputs on the importance of the transportation sector to the ***Rio+20 process***, e.g., through the Partnership on Sustainable Low Carbon Transport (SLoCaT).
8. Participation in the Clean Air Initiative (CAI)-Asia's ***BAQ (Better Air Quality)*** bi-annual meetings, and possibly organizing special sessions on important issues raised by CEEDS.
9. ***Working with ASEAN to explore the potential for common action*** on efficiency standards for some classes of vehicle, or other collaborative actions.

10. Launching a regional program to provide *training and/or master-level classes on transportation planning*. Funding would be critical.

Appendix 1a: Workshop #1

**APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) – Phase 3
 “Energy Efficient Urban Passenger Transportation”
 14-16 September 2011, San Francisco, CA, USA
 Agenda**

DAY 1 - Wednesday, 14th September 2011		
Venue: Marina Room, Hyatt Embarcadero Hotel, San Francisco		
8:30 – 9:00	<i>Registration: In front of Marina Room</i>	
9:00 – 9:35 (35)	<i>I. Opening Session</i> <i>Opening Remarks: Introduction to CEEDS Workshop focal areas, workshop linkages with APEC Ministerial Conference on Energy and Transport</i>	
9:00 – 9:05 (05)	I-1: Opening Remarks by Designated Executant of CEEDS Project	Introduction by Kenji Kobayashi, President of APERC
9:05 – 9:10 (05)	I-2: Opening Remarks by Overseer of CEEDS project	Shinji Kakuno, Director for Natural Resources and Energy Research, Ministry of Economy, Trade and Industry (METI), Japan
9:10 – 9:15 (05)	I-3: Opening Remarks	Susan McDermott, Deputy Assistant Secretary for Aviation and International Affairs, U.S. Department of Transportation (US DOT)
9:15 – 9:30 (15)	I-4: Welcome Remarks by USA as Co-host economy, and overview of Action Items on Urban Transport from APEC Transportation and Energy Ministerial Conference	Jeffrey Skeer, U.S. Department of Energy (US DOE)
9:30 – 9:35 (05)	I-5: Opening Remarks by Singapore as Co-host economy	CHEE Hong Tat, Chief Executive, Energy Market Authority, Singapore
9:35 – 11:15 (80)	<i>II. Kick-off Session to share expected outcome of CEEDS workshops</i> <i>General Moderator: Weerawat Chantanakome, APERC</i>	
9:35 – 9:45 (10)	II-1(a): Presentation on CEEDS Project Phase 3 and Workshop Objectives	Kenji Kobayashi, President of APERC

9:45 – 9:50 (05)	II-1(b): Q&A on presentation	
9:50 – 10:10 (20)	II-2(a): Joint Presentation on Energy Efficient Transportation: Potential for Reducing Energy Intensity and GHG Emissions	Ralph Samuelson, Vice President, APERC and Luke Leaver, Researcher, APERC
10:10 – 10:20 (10)	II-2(b): Q&A on presentations	
10:20 – 10:40 (20)	<i>Coffee Break</i>	
10:40 – 10:55 (15)	II-3(a) Presentation on Policy Template on best practices of Energy Efficient Urban Passenger Transportation – with a focus on Transit-Oriented Development (TOD), Bus Rapid Transit (BRT), and Vehicle Efficiency	Brian T. Castelli, Alliance to Save Energy (ASE)
10:55– 11:00 (5)	II-3(b) Q&A on the presentations	
11:00 – 11:10 (10)	II-4(a): Presentation on The Successful Method of Environmental Policies Maximizing Reduction Potential; “Integrated Approach”	Yosuke Kamba, Deputy Director, Environment Policy Division, Road Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, Japan
11:10 – 11:15 (5)	II-4(b) Q&A on the presentations	
11:15 – 12:50 (95)	<i>III-A. Experts’ Presentation Session: Livable Communities and Transit-Oriented Development (TOD) Moderator: Allison Brooks, Reconnecting America</i>	
11:15- 11:35 (20)	III-A-1 (a) What Transport Oriented Development (TOD) Means: • Definitions and key characteristics • Related sustainable transportation issues • Energy, transport and environmental benefits of TOD	Reid Ewing, University of Utah
11:35- 11:40 (5)	III-A-1 (b) Q&A on the presentation	

11:40- 12:00 (20)	III-A-2 (a) Best Practices for TOD and Livable Low-Carbon Communities in APEC Economies · Components including BRT and other transit, bus, sidewalks and bikeways · EV charging infrastructure linked to smart grids	Patrick Sherry, National Center for Intermodal Transportation, University of Denver
12:00- 12:05 (5)	III-A-2 (b) Q&A on the presentation	
12:05 - 12:25 (20)	III-A-3 (a) Assessing and integrating efficient transportation plans into existing sustainable development plans and targets	James Leather, Asian Development Bank
12:25- 12:30 (5)	III-A-3 (b) Q&A on the presentation	
12:30- 12:45 (15)	III-A-4 (a) Implementing Livable Community Policy – HUD-DOT-EPA Inter-governmental Collaboration	Alven H. Lam, US Department of Housing and urban Development
12:45 – 12:50 (5)	III-A-4 (b) Q&A on the presentation	
12:50 – 14:00 (70)	<i>Lunch at Seacliff D</i>	
14:00 – 15:15 (75)	<i>III-B. Experts' Presentation Session: Transit Planning as a Core Component of TOD Moderator: Jeremy Yap, Land Transport Authority, Singapore</i>	
14:00- 14:20 (20)	III-B-1 (a) Essential Elements of BRT	Cheryl Thole, National Bus Rapid Transit Institute
14:20- 14:25 (5)	III-B-1 (b) Q&A on the presentation	
14:25- 14:45 (20)	III-B-2 (a) Evaluating BRT's Optimal Role Among Public Transit Options	Timothy Papandreou, San Francisco Municipal Transportation Agency

14:45- 14:50 (5)	<ul style="list-style-type: none"> • Definition, Policies • Criteria for choosing BRT vs light rail vs heavy rail / subway / other transits • Profile project on energy, transport and environmental benefits of BRT 	
14:50- 15:10 (20)	III-B-2 (b) Q&A on the presentation	Michael Replogle, Institute for Transportation and Development Policy (ITDP)
15:10- 15:15 (5)	III-B-3 (a) Case Studies: Elements of Successful vs Unsuccessful BRT Development in Developed and Developing Economies	
15:10- 15:15 (5)	III-B-3 (b) Q&A on the presentation	
15:15 – 15:35 (20)	<i>Coffee Break</i>	
15:35 – 17:50 (135)	<i>III-C. Expert Panel on Improving Road Vehicle Efficiency</i> <i>Moderator: Brian T. Castelli, Alliance to Save Energy (ASE)</i>	
15:35- 17:00 (85)	III-C-1. Strategies for Improving Vehicle Fuel Economy	
15:35- 15:50 (15)	(a) Fuel Economy Standards: How Far? How Fast? How Wide? How Best?	Michael Walsh, International Council on Clean Transportation
15:50 – 15:55 (5)	(b) Q&A on the presentation	
15:55- 16:10 (15)	(c) Strategies for Improving Efficiency of Used and Imported Vehicles	Michael Walsh, International Council on Clean Transportation
16:10 – 16:15 (5)		
16:15- 16:30 (15)	(d) Q&A on the presentation	Terence J Collins, Energy Efficiency and Conservation Authority (EECA)
16:30 – 16:35 (5)	(e) New Zealand Vehicle Fuel Economy labelling Scheme	
	(f) Q&A on the presentation	
16:35- 16:50 (15)	III-C-2 (a) Role for pricing and	Jeremy Yap, Land Transport Authority

16:50- 16:55 (5)	congestion management in reducing urban transport times and energy use: High Efficiency Transportation Networks III-C-2 (b) Q&A on the presentation	
16:55- 17:15 (20) 17:15 – 17:20 (5)	III-C-3 (a) Electric Drive Vehicles as an Option for Driving Fuel Economy Improvement: Energy Saving Potential, Charging Infrastructure, and Power Grid Benefits III-C-3 (b) Q&A on the presentation	Daniel Sperling, Institute of Transportation Studies, University of California, Davis
17:20 - 17:50 (30)	Summary Remarks of the Discussion on the DAY 1 by APERC	Kenji Kobayashi, President of APERC
18:45 – 20:00 (75)	<i>Reception at 13 Views, Atrium Level, Hyatt Embarcadero Hotel</i>	
	<i>End of the DAY 1</i>	

DAY 2 - Thursday, 15th September 2011		
Venue: Marina Room, Hyatt Embarcadero Hotel, San Francisco		
9:00 – 9:10 (10)	Brief update on work plan on DAY 2 by Laura Van Wie, Alliance to Save Energy	
<i>9:10 – 10:00 (50)</i>	<i>III-C. Expert Panel on Improving Road Vehicle Efficiency (Cont. from DAY Moderator: Brian T. Castelli, Alliance to Save Energy (ASE))</i>	
9:10- 9:30 (20) 9:30 – 9:35 (5) 9:35 – 9:55 (20)	III-C-4 (a) Energy Efficient Smart and Low Carbon Passenger Transportation in the US (or APEC) cities III-C-4 (b) Q&A on the presentation III-C-4 (c) Reducing CO2	Eugenie L. Birch, Lawrence C. Nussdorf Tomiji Sugimoto, Japan Automobile Manufacturers Association, Inc.

9:55 - 10:00 (5)	Emissions in Road Transport Sector III-C-4 (d) Q&A on the presentation	(JAMA)
10:00 – 12:35 (155)	IV. Presentations: Current Economy Reports based on Pre-workshop Completion of Transportation Policy Template General Moderator: Weerawat Chantanakome, APERC	
10:00-10:25 (25)	IV-1: China · Status of transportation policy & issues · Next steps under discussion · Expected outcome of CEEDS Workshop	Huapu LU, Tsinghua University Moderator : Brian T. Castelli, Alliance to Save Energy (ASE)
10:25-10:50 (25)	IV-2: Mexico · Status of transportation policy & issues · Next steps under discussion · Expected outcome of CEEDS Workshop	Arnold O. Plata-Lopez, National Commission for the Efficient Use of Energy Moderator : Brian T. Castelli, Alliance to Save Energy (ASE)
10:50 – 11:20 (30)	<i>Coffee Break</i>	
11:20-11:45 (25)	IV-3: Philippines · Status of transportation policy & issues · Next steps under discussion · Expected outcome of CEEDS Workshop	Evelyn N. Reyes, Philippines Department of Energy (DOE) Moderator : James Leather, Asian Development Bank, ADB
11:45-12:10 (25)	IV-4: Thailand · Status of transportation policy & issues · Next steps under discussion · Expected outcome of CEEDS Workshop	Prasert Sinsukprasert, Department of Alternative Energy Development and Efficiency (DEDE) Moderator : Weerawat Chantanakome, APERC

12:10-12:35 (25)	IV-5: Viet Nam <ul style="list-style-type: none"> • Status of transportation policy & issues • Next steps under discussion • Expected outcome of CEEDS Workshop 	Tran Anh Duong, Ministry of Transport of Viet Nam Moderator : Tomiji Sugimoto, Japan Automobile Manufacturers Association, Inc. (JAMA)
12:35 – 13:45 (70)	<i>Reception at 13 Views, Atrium Level, Hyatt Embarcadero Hotel</i>	
13:45 – 17:15 (210)	<i>V. Breakout Group Discussion on Next Steps for Developing Energy Efficient Transportation Policies and Systems in Each Participating Economy</i> <i>(Moderator for each economy’s invited speaker – Same as in Moderator in Session IV breakout group)</i> <i>General Moderator: Weerawat Chantanakome, APERC</i>	
15:40 – 16:00 (20)	Small group discussions and individual consultations with invited experts, ASE and APERC researchers on the next steps to develop energy-efficient urban passenger transportation policies and systems in each participating economy. An APERC researcher will assist each participating economy by writing a summary report with experts’ suggestions on the next steps and road maps to promote efficient urban transportation policies and systems in each economy in order to assist each delegate in making a presentation during Day 3. <i>Coffee Break</i>	
17:00 – 17:15 (15)	Summary of the discussions and outcomes on DAY 2 by APERC	
	<i>End of the Day 2</i>	

DAY 3 - Friday, 16th September 2011		
Venue: Marina Room, Hyatt Embarcadero Hotel, San Francisco		
9:00- 9:30 (30)	Recap of DAY 1 & DAY 2 Facilitated Discussion	Brian T. Castelli & Laura Van Wie, Alliance to Save Energy

<p>9:30 – 12:30 (180)</p>	<p>VI. Wrap Up Session <i>Presentations by five APEC Economy Representatives on the next steps to develop Energy-Efficient Transportation Policies and Systems in Each Participating Economy</i> <i>General Moderator: Weerawat Chantanakome, APERC</i></p>	
<p>9:30-10:00 (30)</p>	<p>VI-1: China</p> <ul style="list-style-type: none"> · Presentations by delegates about draft proposals on the next steps/road map for each participant's economy to develop energy efficient transportation policies and systems · Discussion for identifying key points in the future proposal, which will be presented at the second CEEDS Phase 3 workshop. 	<p>Huapu LU, Tsinghua University</p> <p>Moderator : Brian T. Castelli, Alliance to Save Energy (ASE)</p>
<p>10:00-10:30 (30)</p>	<p>VI-2: Mexico</p> <ul style="list-style-type: none"> · Presentations by delegates about draft proposals on the next steps/road map for each participant's economy to develop energy efficient transportation policies and systems · Discussion for identifying key points in the future proposal, which will be presented at the second CEEDS Phase 3 workshop. 	<p>Arnold O. Plata-Lopez, National Commission for the Efficient Use of Energy</p> <p>Moderator : Brian T. Castelli, Alliance to Save Energy (ASE)</p>
<p>10:30-11:00 (30)</p>	<p>VI-3: Philippines</p> <ul style="list-style-type: none"> · Presentations by delegates about draft proposals on the next steps/road map for each participant's economy to develop energy efficient transportation policies and systems · Discussion for identifying key points in the future proposal, which will be presented at the 	<p>Evelyn N. Reyes, Philippines Department of Energy (DOE)</p> <p>Moderator : James Leather, Asian Development Bank, ADB</p>

	second CEEDS Phase 3 workshop.	
11:00 – 11:30 (30)	<i>Coffee Break</i>	
11:30-12:00 (30)	<p>VI-4: Thailand</p> <ul style="list-style-type: none"> • Presentations by delegates about draft proposals on the next steps/road map for each participant's economy to develop energy efficient transportation policies and systems • Discussion for identifying key points in the future proposal, which will be presented at the second CEEDS Phase 3 workshop. 	<p>Prasert Sinsukprasert, DEDE Moderator : Weerawat Chantanakome, APERC</p>
12:00-12:30 (30)	<p>VI-5: Viet Nam</p> <ul style="list-style-type: none"> • Presentations by delegates about draft proposals on the next steps/road map for each participant's economy to develop energy efficient transportation policies and systems • Discussion for identifying key points in the future proposal, which will be presented at the second CEEDS Phase 3 workshop. 	<p>Tran Anh Duong, Ministry of Transport of Viet Nam Moderator : Tomiji Sugimoto, Japan Automobile Manufacturers Association, Inc. (JAMA)</p>
12:30 – 14:30 (120)	<i>Reception at 13 Views, Atrium Level, Hyatt Embarcadero Hotel</i>	
14:30 – 15:20 (50)	<i>VII. Closing Session</i>	
14:30- 14:50 (20)	VII-1: Summary Report by Alliance to Save Energy	Brian T. Castelli, Alliance to Save Energy
14:50 - 15:00 (10)	VII-2: Next Steps for 2nd Phase 3 workshop in Singapore	Kenji Kobayashi, President, APERC

15:00- 15:10 (10)	VII-3: Closing Remarks by USA as Co-host economy	Jeffrey Skeer, U.S. Department of Energy
15:10- 15:20 (10)	VII-4: Closing Remarks by Designated Executant of CEEDS Project	Kenji Kobayashi, President of APERC
	<i>End of the Workshop</i>	

Appendix 1b: Workshop #2

**APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) -
Phase 3
“Energy Efficient Urban Passenger Transportation”
17-19 January 2012, Singapore**

DAY 1 - Tuesday, 17 January 2012		
Venue: The Empress 2 function room on Level 2, the Carlton Hotel, Singapore		
8:00 – 8:15	Registration	
8:20 – 8:40 (20)	II. Opening Session	
8:20 – 8:25 (05)	I-1: Welcome Remarks	Mr. Kenji Kobayashi (APERC)
8:25 – 8:30 (05)	I-2: Opening Remarks	Ms. Jane Lim (EMA, Singapore)
8:30 – 8:40 (10)	Photo Session	
8:40– 9:40 (60)	II. Kick-off Session to share expected outcome of CEEDS workshop	
8:40 – 8:55 (15)	(a): Presentation on Expected Outcome	Mr. Kenji Kobayashi
8:55– 9:10 (15)	(b): Q&A on presentation	
9:10 – 9:40 (30)	(c): Presentation: Energy-Saving Impacts of Better Urban Planning and Improved Vehicle Efficiency	Ralph Samuelson (APERC) and Luke Leaver (APERC)
III. Next steps for each participating economy		
9:40-10:40 (60)	III-1: China (a) Kick-off to highlight Key Challenges to develop energy efficient passenger road transportation by Moderator (b) Presentation on refined proposal on the next steps (c) Comments on the presentation by Moderator (d) Discussions	Mr. Brian Castelli (ASE) Prof. Huapu Lu Mr. Brian Castelli

	(e) Summary by Moderator for China to develop energy efficient passenger road transport	Mr. Brian Castelli
10:40 – 10:50 (10)	<i>Coffee Break</i>	
10:50 -11:50 (60)	<p>III-2: Indonesia</p> <p>(a) Kick-off to highlight Key Challenges to develop energy efficient passenger road transportation by Moderator</p> <p>(b) Presentation on refined proposal on the next steps</p> <p>(c) Comments on the presentation by Moderator</p> <p>(d) Discussions</p> <p>(e) Summary by Moderator for Indonesia to develop energy efficient passenger road transport</p>	<p>Mr. Michael Replogle</p> <p>Ms. Maryam Ayuni</p> <p>Mr. Michael Replogle</p> <p>Mr. Michael Replogle</p>
<i>11:50-13:20 (90)</i>	<i>Lunch at Café Mosaic</i>	
13:20-14:05 (45)	<p>III-3: Philippines</p> <p>a) Kick-off to highlight Key Challenges to develop energy efficient passenger road transportation by Moderator</p> <p>b) Presentation on refined proposal on the next steps</p> <p>c) Comments on the presentation by Moderator</p> <p>d) Discussions</p> <p>e) Summary by Moderator for the Philippines to develop energy efficient passenger road transport</p>	<p>Mr. Ko Sakamoto</p> <p>Ms. Loretta G. Ayson</p> <p>Mr. Ko Sakamoto</p> <p>Mr. Ko Sakamoto</p>

14:05-14:50 (45)	<p>III-4: Thailand</p> <p>a) Kick-off to highlight Key Challenges to develop energy efficient passenger road transportation by Moderator</p> <p>b) Presentation on refined proposal on the next steps</p> <p>c) Comments on the presentation by Moderator</p> <p>d) Discussions</p> <p>e) Summary by Moderator for Thailand to develop energy efficient passenger road transport</p>	<p>Dr. Patrick Sherry</p> <p>Dr. Prasert Sinsukprasert</p> <p>Dr. Patrick Sherry</p> <p>Dr. Patrick Sherry</p>
14:50 – 15:05 (15)	<i>Coffee Break</i>	
15:05-15:50 (45)	<p>III-5: Viet Nam</p> <p>a) Kick-off to highlight Key Challenges to develop energy efficient passenger road transportation by Moderator</p> <p>b) Presentation on refined proposal on the next steps</p> <p>c) Comments on the presentation by Moderator</p> <p>d) Discussions</p> <p>e) Summary by Moderator for Viet Nam to develop energy efficient passenger road transport</p>	<p>Mr. Tomiji Sugimoto (JEMA)</p> <p>Mr. Nguyen Huu Tien</p> <p>Mr. Tomiji Sugimoto</p> <p>Mr. Tomiji Sugimoto</p>
15:50 – 17:05 (75)	IV. <i>Special Session</i>	
15:50–16:15 (25)	a) Presentation “MRT Development” and Q&A	Mr. Ho Kum Fatt (LTA)
16:15–16:40 (25)	b) Presentation “Traffic & Public Transport” and Q&A	Dr. George Sun (LAT)
	c) Presentation “Electric	Prof. Harry Hoster (TUM-CREATE)

16:40–17:05 (25)	vehicles for personal transport” and Q&A	
18:15 – 20:30	<i>Welcome Dinner at “Kopitiam,” Swisshotel Stamford Hotel</i>	
	<i>End of DAY 1</i>	

DAY 2 - Wednesday, 18 January 2012		
Venue: The Empress 2 function room on Level 2, the Carlton Hotel, Singapore		
8:30 – 10:45 (135)	<i>IV. Special Session (continued)</i>	
8:30- 9:00 (30)	d) Presentation and Q&A	Dr. Patrick Sherry
9:00 – 9:30 (30)	e) Presentation and Q&A	Mr. Michael Walsh
9:30 – 10:00 (30)	f) Presentation and Q&A	Mr. Michael Replogle
10:00 – 10:15	<i>Coffee break</i>	
10:15-10:45 (30)	g) Presentation and Q&A	Mr. Timothy Papandreou
	<i>V. Work Session</i>	
10:45-12:15 (90)	Speakers and APERC researchers will assist delegates from each participating economy to work out fine-tuned proposal on the next steps for participating economy which will be presented in Session VI.	
12:15 – 13:45 (90)	<i>Lunch at Café Mosaic</i>	
13:45 – 16:55 (190)	<i>VI. Fine-Tuned Proposals on the next steps for participating economies to develop efficient urban passenger transportation</i>	
13:45-14:20 (35)	VI-1: China a) Introduction (review of key points in discussion on first day) by Moderator b) Presentation on fine-tuned proposal on the next steps by delegate c) Discussion/summary by Moderator	

14:20 -14:55 (35)	VI-2: Indonesia a) Introduction (review of key points in discussion on first day) by Moderator b) Presentation on fine-tuned proposal on the next steps by delegate c) Discussion/summary by Moderator
14:55-15:30 (35)	VI-3: Philippines a) Introduction (review of key points in discussion on first day) by Moderator b) Presentation on fine-tuned proposal on the next steps by delegate c) Discussion/summary by Moderator
15:30 – 15:45(15)	<i>Coffee break</i>
15:45-16:20 (35)	VI-4: Thailand a) Introduction (review of key points in discussion on first day) by Moderator b) Presentation on fine-tuned proposal on the next steps by delegate c) Discussion/summary by Moderator
16:20-16:55 (35)	VI-5: Viet Nam a) Introduction (review of key points in discussion on first day) by Moderator b) Presentation on fine-tuned proposal on the next steps by delegate c) Discussion/summary by Moderator
	<i>End of Day 2</i>

DAY 3 - Thursday, 19 January 2012	
Venue: The Empress 2 function room on Level 2, the Carlton Hotel, Singapore	
<i>10:00 – 11:50 (110)</i>	<i>VII. Closing Session</i>
10:00-11:30 (90)	VII-1: Summary report by ASE and Discussion Mr. Brian Castelli Ms. Laura Van Wie

11:30-11:40 (10)	VII-2: Closing Remarks	Mr. Kenji Kobayashi
11:30-11:40 (10)	VII-3: Closing Remarks	Singapore
11:50 – 13:20	<i>Lunch at Café Mosaic</i>	
<i>13:20-17:10</i>	<i>Site Visit: Tour of Sengkang Interchange and Land Transport Gallery</i>	

Appendix 2: PEOPLE'S REPUBLIC OF CHINA

Prof. Huapu LU, Director, Institute of Transportation Engineering, Tsinghua University

China's overall Transportation Development Strategy is based on traffic demand analysis, stopping the country's "car first" development mode, and integrate local, regional, and national efforts to improve transportation systems.

Challenges for Urban Passenger Transportation in China

- Heavy traffic congestion, heavy pollution, serious traffic accidents, and transport energy problems
- New town construction and car populations increasing dramatically
- Lack of infrastructure and traffic facilities, poor travel behavior

Current Activities

- Drafting planning guidelines for green (low-C) transport system under the leadership of the Ministry of Housing and Urban-Rural Development (MOHURD)
- Launching a transit-oriented urban transport construction project by the Ministry of Transport
- Promotion of a "Smooth Traffic" project by the Ministry of Public Security
- Planning a Symposium in Kunming (a city very active in the area of TOD) with a focus on urban passenger transport. The Ministry of Transport will invite 30 other cities to attend the meeting and report their progress.
- Promoting demonstration projects of transit-oriented urban transportation system construction during the 12th Five Year Plan (Ministry of Transport). Before 2013, 30 cities will start pilot demonstrations. Evaluation items include:
 - 500 meter radius coverage of bus station reaches 90% in urban area
 - Buses always available within 500 meters and can transfer within 5 minutes to anywhere downtown
 - Suburban transit service in the same pattern as urban bus systems
 - Barrier free transport in all areas
 - 80% customer satisfaction

First Demonstration Project: **Baoji City**. Two workshops will be carried out with experts to refine the plan for this project. The project will coordinate with the Low Carbon Model Towns (LCMT) initiative.

Goals

- Change travel demand characteristics (reduce distance necessary to reach destinations)
- Reduce car trips
- Improve efficiency of road networks
- Improve vehicle technology
- Prioritize road uses: Walking/biking first, cars last
- Increase mass transit availability (BRT and buses) to ensure adequate alternative transport options
- Influence behavior (through education, enforcement, culture, morals) to discourage car use and encourage walking/biking/mass transit:
 - Parking limits, congestion charging
 - Provide mass transit passes with housing
 - Promote popularity of biking

Draft Fine-Tuned Proposal

Project	Activities
Initiate First Workshop. Goal: To promote construction of EE passenger transport system	Contents of workshop: <ul style="list-style-type: none"> • Introduction of national policies (by NDRC); • eco-city construction (by MOC); • construction of transit-oriented urban transport system (by MOT); • traffic smoothing project output (by MOPS); • Demonstration projects (by cities) • July 2012 (venue to be confirmed)
Promote green transport system planning demonstration. Goals: Relieve traffic congestion, conserve the urban environment, create an energy efficient passenger system, and enhance traffic safety	<ul style="list-style-type: none"> • Revise transport plans for Baoji and Dalian • Create action plan with discrete steps and targets for the decided plan • Show achievements to date
Finalize guidelines for green transport system construction	<ul style="list-style-type: none"> • Collect expert suggestions to enhance the guidelines • Put guidelines in place in pilot cities • Summarize the experience, document challenges and solutions, and revise the guidelines • Develop a plan to have the guidelines published by MOHURD
Draft a transportation annual report for low carbon city construction	Topics to be covered: <ul style="list-style-type: none"> • Situation • Trends • Countermeasures (identifying challenges and solutions, including specific policy options)
Promote transit-oriented urban transport system construction	<ul style="list-style-type: none"> • Create an evaluation indicator system together with MOC • Carry out training for the participating cities to better inform their actions • Summarize the best practices in TOD for transportation

Develop a congestion management (urban traffic smoothing) project in concert with the Ministry of Public Security	<ul style="list-style-type: none"> • Revise evaluation indicator system together with MOPS • Carry out training for the participating cities better inform their actions • Summarize the best practices in congestion management (traffic smoothing)
Develop and try to submit a policy recommendation for central government together with NDRC	<ul style="list-style-type: none"> • Meet with Director of Transportation Division of NDRC to discuss how to collaborate • Promote relevant parts of policy recommendations and plans, together with NDRC

Discussion and Additional Suggestions from CEEDS Participants

1. Explore ways to reduce emissions from Chinese ports (e.g., emission controlled areas).
2. Clarify relationship of working plan with APEC LCMT project; consider combining transport workshop with upcoming LCMT forum.
3. Focus on:
 - Reducing city block size
 - Aggressive public education campaign to ensure that the principles of sustainable transport are widely understood.

Appendix 3: INDONESIA

*Ms. Maryam Ayuni, Director for Energy Conservation,
Ministry of Energy and Mineral Resources*

Energy consumption in Indonesia is growing 7% per year. Dependence on fossil energy is high and fossil fuel subsidies are increasing. The transportation sector accounts for 32% of total energy consumption in Indonesia – and this share is expected to grow to 39% by 2025. A recent study showed energy saving potential of 15–35% in the transportation sector; the government’s target is 20% over the period 2011–2025.

Challenges for Urban Passenger Transportation in Indonesia

- Highly subsidized diesel and premium gasoline (45%)
- Inadequate supply of unleaded fuel and high-quality lubricant
- Need to increase the supply of eco-friendly fuel (bio-fuel and gas), and expand distribution of high-quality fuel (pertamax, pertamax plus)
- Need to increase electricity energy supply and stabilize distribution
- Pipeline technology used in CNG fuel distribution causes supply problems (need more pipelines to get fuel to market and more refueling stations)

Current Activities

Strategic Development Programs
Bus Rapid Transit: Transit systems developed in 14 cities, 2004-2011
Traffic Management: <ul style="list-style-type: none"> ○ Three in one ○ Electronic Road Pricing ○ Intelligent Transport System ○ Parking Management
Improve Vehicle Technology: <ul style="list-style-type: none"> ○ Standards -- Euro2, Euro4 (2012), Euro5 (2015) ○ Fuel saving/fuel efficiency ○ Eco-friendly vehicles: Electric and hybrid cars
Diversify Energy: <ul style="list-style-type: none"> ○ CNG and LNG ○ Biofuels (biodiesel and bioethanol) – regulation to make it mandatory: <ul style="list-style-type: none"> - 20% biodiesel use (minimum) by 2025 - 25% bioethanol use (minimum) by 2025 ○ Gasification Program: Converter kits provided to: <ul style="list-style-type: none"> - 2575 taxis in Jakarta (2007-2008) - 1667 public transport providers in Palembang and Bogor (2009) - 450 BRTs in Surabaya (2010)

Goals and Opportunities

Objectives for Transportation Development, 2010-2014 (from Presidential Regulation No. 5)	
Objectives	Indicators
Increase capacity of facilities and infrastructure for transportation	Good condition for national roads/highways = 90% Increasing public urban transport users Alignment between development program for transportation sector and spatial conditions
Increase public accessibility for transportation services	Developing transportation network system for the whole community Promoting transportation services for remote areas Providing transportation services for the poor using PSO Scheme Increasing the affordability of transportation services for communities with disabilities, the poor, and the elderly.

Goals and Opportunities: Fuel quality and supply

- Reduce sulfur in fuel from 500 ppm to under 50 ppm (to meet Euro4 emissions standards in 2012)
- Consider introducing two grades of fuel with dual distribution system
- Phase in biofuel use mandate 2008-2025
- Address CNG pipeline issue with investor workshops; try to coordinate and fast-track government approvals.

Goals and Opportunities: Vehicle fuel efficiency

- Labeling could be by-product of emission testing
- Consider vehicle fuel efficiency standards, building on Malaysian program
- Form Green Council to foster inter-ministerial coordination (model after Malaysia)

Goals and Opportunities: Vehicle fleet improvement

- Learn from and adapt Philippines' clean/electric three-wheelers

Goals and Opportunities: Foster BRT and traffic management

- Eliminate fuel subsidies, reallocate funds to national investment fund (cities can use funds to develop mobility plans, design standards, BRT, etc., as with India JNNURM)
- Encourage innovative finance (e.g., public-private partnerships) with legislation (regularize concession agreements, accountability for performance)
- Require regional transport authorities that prepare comprehensive mobility plans and carry out M&V and performance based contracting.
- Build traffic management into mobility plans. Include 3-year work programs to improve parking management and pricing, traffic signals, road design improvement, safety programs.

- Adopt new urban design standards that include parking maximums, and mixed development that is pedestrian and bike friendly and transit oriented.
- Create financing and design standards for cycle ways on most streets.

Goals and Opportunities: Financing

- The Federal government should convene an interagency coordination process with Ministries (i.e., Finance, Transport, Environment, Public Health, Economy) to create and adopt national sustainable transport policy.
- Policy should consider funding, accountability for performance, governance, public involvement, and institutional capacity.
- Build capacity at all levels (local regional national) through training, technical assistance, data standards and data collection, reporting and monitoring capacity, transparency, and funding incentives.
- Develop decentralized transportation data center to validate data and enhance public access to data.

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Program	Objectives	Timeframe	Agencies in Charge	Remarks
Developing Intelligent Transport System (ITS)	Reduce traffic congestion, promote cross-sectoral coordination	2010-2020	Ministry of Transportation, Regional Office for Transportation	Implemented in Jabodetabek, Pekanbaru, Palembang, Bandung, Semarang, Surabaya, Bali. 2012: Medan, DI Yogyakarta
Implementation of Parking Mgmt	Reduce use of private vehicles	2010-2020	Regional Office for Transportation	
Reform System of BRT/Semi-BRT	Procurement and Distribution of BRT	2010-2020	Ministry of Transportation, Regional Office for Transportation	Implemented in Yogyakarta Pekanbaru, Palembang, Bandung, Semarang
Improvement of public transportation facilities	Improve public transport facilities	2010-2020	Regional Office for Transportation	Ministry of Transportation will only issue permit for low emission vehicles (Euro2)

Installation of converter kits (gasification program)	Install converter kits for taxis and urban transport	2010-2020	Ministry of Transportation, Ministry of Energy and Mineral Resources, Regional Office for Transportation	Converter kits installed: Jakarta (1755) Palembang (666) Bogor (1001) Surabaya (445) Jakarta-Depok (400)
Training on eco-driving	Training on eco-driving that can save energy	2010-2020	Ministry of Transportation, Regional Office for Transportation	Implemented in two cities (Tegal and Semarang)
Development of non-motorized transport	Construct facilities for non-motorized transport (e.g., bike lanes)	2010-2020	Ministry of Transportation, Regional Office for Transportation	Encourage the development of bike lanes and pedestrian facilities in Bandung, Yogyakarta, Balikpapan, Semarang, Denpasar, Surabaya

Discussion and Additional Suggestions from CEEDS Participants

1. For each activity in the proposal, specify timeline, responsibility and reporting, and financing source.
2. Apply lessons from trans-Jakarta BRT (institutional structures, training programs) to smaller cities.
3. Financing:
 - Consider India JNNURM financing example for cities
 - Consider performance contracting for development of BRT systems
4. Clarify relationship of proposed activities to the LCMT initiative.
5. Take further steps to adopt stronger standards on emissions (e.g., consider life-cycle emissions of biofuels).

Appendix 4: MEXICO

*Mr. Arnold O. Plata-Lopez, Deputy Director of Energy Efficiency Policies,
National Commission for the Efficient Use of Energy (CONUEE)*

Challenges for Urban Passenger Transportation in Mexico

- Traffic congestion, pollution, energy use
- Inefficient used vehicle imports

Goals and Opportunities

- Improve fuel economy of vehicles entering the fleet (both new vehicles and imported used vehicles)
- Improve regulatory structure
- Consider economic incentives to promote efficient transport choices
- Increase availability and attractiveness of public transit options
- Improve urban traffic management
- Rein in urban sprawl

Draft Proposal

- a. Improve vehicle efficiency
 - New fuel economy/greenhouse gas standards for light and heavy duty vehicles tied to:
 - Tax scheme based on vehicle performance
 - Financial incentives for vehicles that exceed standards
 - Accelerated replacement of inefficient vehicles
 - Mandatory registration of imported used vehicles (New Zealand model)
- b. Improve fuel quality
 - Set quality standards
 - Increase capacity of PEMEX to enforce standards
- c. Improve energy diversity
 - Consider low carbon fuels
 - LPG buses
- d. Improve driving behavior
 - Information campaign

- Focus on freight (GPS monitoring, education, recognition)
- e. Promote shifts to lower-carbon transport modes in cities
- Reduce/eliminate fuel subsidies
 - Promote non-motorized/more efficient modes:
 - Bike sharing and walkability projects (enhance safety!)
 - Promote BRT, subways, rail
 - Highlight public transit success stories
- f. Land use/TOD planning
- Engage decision makers and private developers
 - Revise street design standards (*Complete Streets*)
 - Strengthen environmental impact accountability laws
 - Focus on parking management

Appendix 5: PHILIPPINES

*Ms. Evelyn N. Reyes, OIC Director, Energy Utilization Management Bureau,
Department of Energy*

2% of the GDP of the Philippines is lost through congestion; a large percentage also is lost to traffic accidents. The Philippines also pays \$7.5 Billion/year for imported oil.

Challenges for Urban Passenger Transportation in the Philippines

- Proliferation of unregistered, unregulated transit operators (buses, jeepneys)
- Congested rail system
- Lack of government capacity to implement energy efficiency transport policies and regulations

Goals and Opportunities

- Implement and enforce existing transport energy efficiency policies and DOE Action Plan, and support passage of legislation on incentives for alternative fuel vehicles, and EE and Conservation bill.
- Promote interagency coordination on implementation of National Environmentally Sustainable Transport Program.
- Build capacity and increase resources of government agencies responsible for transport programs.
- Create integrated, focused information campaigns about transport issues.
- Develop alternative fuels roadmap (CNG buses pilot), e-trikes, auto-LPG for jeepneys, e-buses.
 - Harmonize biofuel blends with Euro 4 standard.
 - Carry out R&D on alternative fuels technologies.
- Promote public-private coordination and involvement of citizens (“people power”) in land use planning.
- Consider BRT project feasibility (Cebu or Metro Manila).
- Scale up electric tricycles program (in tranches).

Draft Fine-Tuned Proposal

Avoid-Shift-Improve Strategy

Objective	Activities/Timeframes
AVOID	
Integrate mobility in land use planning	<ul style="list-style-type: none"> • Short term – coordinate with HLURB for wide-scale TOD adoption • Medium term – E.O. or other issuance requiring TOD adoption
Scale up best practice in non-motorized transport:	Advocate for NMT best practice, using Marikina as a model
Promote PPP in infrastructure development	Continue supporting the promotion of PPP in infrastructure development
SHIFT	
Scale up E-Trike program	<ul style="list-style-type: none"> • Short term (one year) – Initial Phase (20K e-trikes) • Medium term (2-5 yrs) – Roll out in further cities • Long term (more than 5 yrs)– reach 100K e trikes
Promote other E-vehicles (jeepneys, buses, shuttles, cars)	<ul style="list-style-type: none"> • Short term (one year) – Pilots • Medium term (2-5 yrs) – Roll out in further cities • Long term (more than 5 yrs) – appx 28K e-vehicles
BRT projects	<ul style="list-style-type: none"> • Short term (one year) – Feasibility studies, Cost-benefit studies for Cebu, etc. • Medium term (2-5 yrs) – BRT in Cebu • Long term (more than 5 yrs) – Other BRT (Manila, Davao)
IMPROVE	
Promote clean fuels	<ul style="list-style-type: none"> • Short term (one year) – Develop and validate alternative fuels roadmap • Medium term (2-5 yrs) – Pass legislation
R&D	<ul style="list-style-type: none"> • LCC/well to wheel analysis • Testing of vehicle and fuel performance • New and emerging technologies
Interagency coordination	
Formulate fuel economy standards for new vehicles	<ul style="list-style-type: none"> • Short term (one year) – Collaborate with relevant agencies/organizations to identify ways forward; collect data and suggest voluntary measures on fuel economy standards; consider harmonization and regional cooperation with other Asian countries • Medium term (2-5 yrs) – Standard setting and labeling based on emission standards already in place under the Clean Air Act of the Philippines

Action Plan

1. Promote clean fuels: Roadmaps, legislation with incentives, Euro4 standards, R&D, inter-agency coordination
 - Roadmap: Reduce gasoline use by 30% by 2013 (CNG, LNG, E-vehicles), step up deployment of these fuels in buses, jeepneys, e-vehicles.
 - NGV Program for public transport (more stations and more vehicles)
 - 2002 NG Industry master plan under review.
 - Auto LPG Program, being extended to public jeepneys, and public utility buses (dual fuel bus utility program just launched in December 2011).
 - Biofuels implementation plan (already mandatory in government vehicles). Note: There are difficulties in the supply of bio-ethanol.
 - Harmonize biofuel blends with Euro4 standards – target date of 2012-2014 for development of fuel standards for Euro4 vehicles.
 - Legislation providing incentives for the manufacture, assembly, and importation of EVs

2. Promote efficient transport systems (EVs) (e.g., scale up electric tricycle programs, buses, jeepneys)
 - Promotion and demonstration of EVs (623 EVs demonstrated nationwide)
 - E-trikes project funded by ADB: 2012-2017 – \$500 million under negotiation
 - Cebu BRT – 300 km (first to be constructed) – to be functional by 2013

3. Integrate mobility in land use planning – e.g., TOD, and non-motorized transport promotion
 - Land use bill, other bills
 - Savendra commercial district in Metro Manila TOD project: High-rise residential facilities, commercial and business center, mall, passenger drop/pickup point, bus and taxi terminals, interconnected streets, parking area, E-trikes and CNG bus terminal

4. Conduct DOE information and education campaign (IEC): “Bright Now”
 - Seminars on eco-driving habits
 - Spot checks of LPG vehicles
 - Vehicle technology demonstration programs (e.g., jeepneys),
 - Fuel economy runs
 - Seminar on LPG-vehicle conversions

- Improve the image and physical appearance of public transport

5. Good governance:

- Develop monitoring and evaluation framework: Put in place a reporting system/mechanism
- Avoid corruption: Advocate strict enforcement of existing policies and regulation against corruption.

Discussion and Additional Suggestions from CEEDS Participants

1. Possible LCMT nominations – Global City, Cebu, Quezon City, Serendra (metro Manila)
2. Explore harmonization of fuel efficiency standards with other economies in the region.
3. Tricycle fleet:
 - Make electric tricycles attractive so people will want to ride in them.
 - Create plan for disposing of old fleet when new vehicles are introduced.
4. Consider regulating emissions from LPG and CNG for converted vehicles (e.g., diesel to LPG).
5. Propose executive order or other issuances pertaining to the adoption of TOD with possible provision for funding for cities that adopt such TOD schemes.
6. Include subnational-level planning.
7. Focus on transport demand management in addition to improved vehicles.

Appendix 6: THAILAND

Dr. Prasert Sinsukpraset, Director of Planning Division, Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy

35% of Thailand's energy use is for transportation. The Thai Energy Efficiency Master Plan put in place targets to reduce overall energy intensity by 25% by 2030, to reduce energy consumption in road transport by 13,400 KTOE, and to reduce CO₂ emissions in the transport sector by 20 million TON/year (with support of the Clean Development Mechanism).

Challenges for Urban Passenger Transportation in Thailand

- Bottlenecks around gateways
- Incomplete road network
- Enormous travel volume/congestion
- Population movements out of cities that result in long commutes
- Low quality bus system, limited BRT/rail

Current Strategies

- Information and awareness campaign
- Improvement of public transport
- Improvement of traffic management
 - Promote car/van-pooling (connections to mass transit)
 - Encourage purchase of energy efficient cars
 - Change population trends/bias toward commuting back to city schools and hospitals
- Promoting fuel economy standards
- Urban design for Low Carbon Development

Goals and Opportunities

- b. Short term:
 - Public information and education: web, mobile info, ITS, brochures, TV/radio, school programs, eco-driving training
 - Cooperation with public & private agencies:
 - Bangkok Mass transit authority, Government owned vehicles

- Airport authority (limousines, parking priority for efficient vehicles)
 - Waterway improvements (LNG, biofuels, solar ferries)
 - Private sectors (cement companies, superstores, etc.) -- showcase EE transportation in short term
- c. Medium term: Improve public transport
- o Increase public transit use, expand systems and improve quality (buses, gold standard BRT), introduce efficient/CNG buses
 - o Intelligent routing and real-time passenger information
 - o Convenient ticketing for different modes
 - o Improved park and ride facilities
 - o Car-pooling vans
- d. Longer term:
- o Demand pricing (road user charges, pay-as-you-drive insurance)
 - o Urban planning (applicable outside central Bangkok): TOD with self-sufficient district, better city planning, bike/walking lanes
- e. Ongoing Strategies:
- o Promotion of energy efficient vehicles
 - Eco-car program (tax exemptions for efficient cars): Nine auto companies are participating in the program, so “Eco-car” has become an endorsement label
 - Flexible Fuel Vehicles, hybrid, hydrogen, EVs
 - R&D for fuel efficiency technologies
 - Energy efficient vehicle labeling program (under discussion with stakeholders)
 - Tax privileges for high EE vehicles
 - Car parking/HOV lane privileges
 - High fuel economy standards: Starting with motorcycles, and will later try with cars and trucks.
 - o Institutional/capacity building
 - Coordinate among public agencies
 - Practical database
 - Capacity/skill building and knowledge management
 - Systematic and regular monitoring and evaluation
 - Good governance and accountability

Draft Fine-Tuned Proposal:

Short term/immediate		
Behavior changes	info to drivers, improved traffic controls, Govt lead by example	Info to drivers through web, brochures, TV/radio, school programs, eco-driving training
		Intelligent traffic information system (info displays, info to iPads and iPhones), intelligent traffic control systems and parking information, Efficient accident recovery system
		Cooperate with private and government agencies to promote EE in transport: High EE/CNG driven buses, airport authority, govt-owned vehicles, waterway improvements (e.g., solar ferries etc.), private sectors
Medium term		
Promote high EE vehicles and alternative fuels	R&D for alternative fuels, promotion of low-emission/high EE vehicles, removal of fossil fuel subsidies	R&D into biofuels (e.g., algae), improve productivity, improve cassava yield, plastic to liquid, BHD, ED95
		Eco-cars, FFV, Hybrid/H2/EVs; energy labeling and fuel economy standards, tax privileges for high EE vehicles; car parking/HOV lane privileges; reduced import duties
		Phasing out fuel subsidies for LPG and NGV, and Diesel in 2012
Long term		
Change transportation modes	Improve public transport, urban planning, driving demand pricing	Increase use of public transport, expand MRT
		Develop gold standard BRTs
		Intelligent routing system, real-time passenger information
		One ticket convenient system, better park and ride
		Car-pooling vans
		Demand pricing (road user charges, pay-as-you-drive insurance)
		Urban planning (TOD, better city planning, bicycle/walking lanes)
	Supporting measures: Institutional cooperation and capacity building	Coordination among agencies
		Good database
		Enhance capacity and skills + knowledge management
		M&E and Reporting
		Good governance and accountability

Activities

Activity	Tasks	Indicators	Timeframe
Urban Design for Low-C Development			
Create agency to promote LCD/TOD	<ul style="list-style-type: none"> Promote campaign on LCD/TOD Develop guidelines and training Community involvement Integrated city planning Data collection and monitoring 	Agency developed, number of cities with LCD/TOD plan	1-2 years
Demonstration projects	<ul style="list-style-type: none"> Establish Investment Fund Work with developers and financiers 	Number of projects or cities implemented LCD/TOD	2-5 years
Regulations	<ul style="list-style-type: none"> Zoning Street design and codes Dwellings/building codes 	Energy consumption on transport, distance and time travel, mode shares	3-10 years
Promote EE Use of Fuels			
Remove fuel subsidies	<ul style="list-style-type: none"> Remove fuel subsidies Data collection and monitoring 	Energy prices	1-2 years
Energy labeling, Tax/financial incentives	<ul style="list-style-type: none"> Work with automobile industry, PPPs Energy labeling Tax/financial incentives 	Number of high EE vehicles sold	2-5 years
Regulations	<ul style="list-style-type: none"> Fuel economy standards Emission standards 	Avg. energy consumption per distance traveled, lower emissions	keep updating
Planning			
Discussion among responsible agencies (Ministries of Transport, Interior, Finance, etc.)			
Develop a Master Plan on LCD, focusing on transportation			

Discussion and Additional Suggestions from CEEDS Participants:

1. Investment funds:
 - Over time (as local governments get stronger), consider setting up infrastructure incentive fund for cities, tied to having comprehensive mobility plans.
 - Enhance Government joint fund with developers/private investors. The Thai Government has already contributed 1 billion baht, and has received a return of 10%

per year. They would like to double the fund. Private investors could put money in and get returns as well as recognition. The fund also could operate as a revolving fund, with returns going toward other investments.

2. Considerations for Thailand's transport/TOD planning:
 - Make sure non-motorized transport is not precluded
 - It is important to consider efficiency in areas outside Bangkok
3. Consider pilot integrated TOD district in Bangkok:
 - Car free zones
 - Parking facilities
 - Public transit

Appendix 7: VIET NAM

*Mr. Tran Anh Duong, Deputy Director General, Department of Environment,
Ministry of Transportation*

Mr. Nguyen Huu Tien, Department of Environment, Ministry of Transportation

Challenges for Urban Passenger Transportation in Viet Nam

- Lack of urban land for transport infrastructure in cities
- Insufficient public bus service, no mass transit systems in large cities
- Proliferation of motorbikes for personal transport
- Poor and inadequate infrastructure
- Congestion

Goals and Opportunities

- Integrate new urban rail lines in major cities with other transport modes (buses, BRT, bikes/walking paths)
 - Facilitate the execution of urban rail projects in Ha Noi and Ho Chi Minh City
 - Enhance public bus service in Ha Noi and Ho Chi Minh City
 - New bus (including the utilizing of CNG buses) and BRT routes planned
 - ADB Study to integrate urban transport modes in both cities
- Improve vehicle fuel economy and emissions
 - May 2012 evaporative emission standard for motorbikes
 - Implement inspection/maintenance regulations for in-use motorbikes in Ha Noi and Ho Chi Minh City (expand in 2015).
 - Enforce Euro 3 emissions standards for motorbikes by 2017.
 - Enforce Euro 4 and Euro 5 emissions standards for cars by 2017 and 2022, respectively.
 - Enforce fuel economy labeling system for cars by 2015.
- Public information and incentives
 - Training/awareness on eco-driving and public transport
 - Tax incentives for EE vehicles
 - Parking charges in large cities
 - Environmental tax for vehicles

Draft Fine-Tuned Proposal

Goals	Measures and Interventions	Targets and Timeframes
Develop land for transport in urban areas from 16% to 26%	<ul style="list-style-type: none"> • Construction and improvement of roads and parking • Expanding pavement of all roads in the city • Construction of overpasses and tunnels 	<ul style="list-style-type: none"> • 2011-2015: Complete master plan for all cities to achieve goals • 2012-2020: Develop ring-road, and parking system, overpass, and tunnels; expand some roads and pavement in the center • 2020-2030: Continue constructing transport infrastructure developing the land for transport from 16% to 26%
Promote public transport	<ul style="list-style-type: none"> • Facilitate execution of urban rail projects in Ha Noi and Ho Chi Minh City • Enhance public bus service in Ha Noi and Ho Chi Minh City (increase lines, replace buses, driver education) 	<ul style="list-style-type: none"> • 2011-2015: Increase the number of bus lines in the cities; enhance public bus service (assume 10-15%) • 2012-2020: Construct urban railway system in HN and HCM City and put in operation (assume 25-30%) • 2020-2025: Develop railway systems
Restrain private transport	<ul style="list-style-type: none"> • Impose taxes on: Vehicle ownership (import tax, registration); circulation fees (via fuel, environment tax) • Restrict parking, drivers' licenses • Apply emissions standards for used motorbikes 	<ul style="list-style-type: none"> • 2011-2012: Establish regulation on tax and fees of vehicle ownership and put in effect • 2013-2015: Establish and apply the emission standard for used motorbikes
Control emissions and fuel consumption	<ul style="list-style-type: none"> • Improve and apply emissions standard system of transportation means • Establish database on gas emissions and energy consumption in the transport sector 	<ul style="list-style-type: none"> • 2011-2013: Improve and apply the emission standard systems of transportation means • 2013-2015: Establish database on gas emissions and energy consumption in the transport sector
Reduce congestion	<ul style="list-style-type: none"> • Set flexible working hours • Planning and strategy activities (move government offices and universities outside the central city; ban construction of highrise buildings in central cities) • Reorganize traffic (lane setting, traffic signs and signals) • Introduce coordinated traffic signal system • Provide transport information by radio and internet 	<ul style="list-style-type: none"> • 2011-2012: Set flexible working hours and put in effect; reorganize traffic; improve transport information systems • 2012-2015: Move some government offices outside central cities; Introduce coordinated traffic signal system • 2015-2020: Move some government offices and universities outside central cities
Increase fuel economy/cleaner vehicles	<ul style="list-style-type: none"> • Apply emission standard in inspections for used cars • Use evaporative emissions standard for motorbikes • Enforce Euro 3 emissions standard for motorbikes • Enforce Euro 4 and Euro 5 emissions standards for cars 	<ul style="list-style-type: none"> • 2011-2015: Improve emission standard in inspections for used cars and used motorbikes; test certificate for 50% used cars and 15% used motorbikes • 2015-2017: Establish and apply the emissions standards to allow Euro 4 for cars and Euro 3 for motorbikes

	<ul style="list-style-type: none"> • Enforce fuel economy labeling system for cars and motorbikes • Training/awareness on eco-driving and public transport 	<p>(test certificate for 100% used cars and 30% used motorbikes).</p> <ul style="list-style-type: none"> • 2017-2022: Establish and apply the emissions standards to allow Euro 4 for cars (test certificate for 50% used motorbikes).
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Project Ideas

Project Idea	Timeframe	Estimated Budget (million USD)	Agencies in Charge
Introduce combined efforts to improve urban transport in cities Vietnam	2012-2013	1	<ul style="list-style-type: none"> • Vietnam Road Directorate • Provincial People's Committee
Support enterprises to apply LPG, CNG, and EVs in public transport in Ha Noi, Ho Chi Minh City, and Da Nang City	2012-2015	2	<ul style="list-style-type: none"> • MOT • MOIT Provincial People's Committee
Experimental project on Eco-driving training; promotion of Eco-driving	2011-2015	0.5	<ul style="list-style-type: none"> • Vietnam Road Directorate
Launch information campaign to raise public awareness on EEC in transport sector	2012-2015	0.2	<ul style="list-style-type: none"> • Department of Environment • MOT
Establish database on EEC and gas emissions in the transport sector as a tool to access the current information, forecast the future, and propose and ratify action plans and policies	2012-2013	1	<ul style="list-style-type: none"> • MOT • MOIT

Discussion and Additional Suggestions from CEEDS Participants

1. Ensure that adequate public transport is available before putting restraints on private transport (e.g., look at experience of Singapore).
2. Consider reallocating street space for BRT and perform analysis of the effects of banning high-rise buildings.
3. Consider strategies to promote use of clean two wheelers as a key form of transportation, keeping in mind safety issues (motorcycle speed may need to be restricted).
4. Make LCMT project in DaNang an example for other cities in Viet Nam.