Cities Forum on Environmentally Sustainable and Healthy Urban Transport

Manila, Philippines
7 April 2010
REPORT

CITIES FORUM ON ENVIRONMENTALLY SUSTAINABLE AND HEALTHY URBAN TRANSPORT

Convened by:

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

Manila, Philippines
7 April 2010

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World Health Organization
Regional Office for the Western Pacific
Manila, Philippines

June 2010
NOTE

The views expressed in this report are those of the participants in the Cities Forum on Environmentally Sustainable and Healthy Urban Transport and do not necessarily reflect the policies of the World Health Organization.

This report has been prepared by the WHO Regional Office for the Western Pacific for governments of Member States in the Region and for those who participated in the Cities Forum on Environmentally Sustainable and Healthy Urban Transport, held in Manila, the Philippines, on 7 April 2010.
The Western Pacific Region is experiencing rapid unplanned urbanization, with more than 60% of its population living in urban areas. When urbanization is unplanned, its attendant urban transport system is at risk of affecting the health and safety of the population through air and noise pollution, greenhouse gas (CO₂) emissions generated by motor vehicles, road traffic crashes, physical inactivity, exposure to second-hand smoke in confined public transport systems, and a lack of accessibility or barrier-free transport systems for people with disabilities and the elderly, among others.

Intersectoral efforts to address health and transport issues are crucial in achieving better health outcomes in cities. In support of the theme of World Health Day 2010 on urbanization and health, it was proposed that a forum of cities be convened to advocate for policy and action on environmentally sustainable and healthy urban transport (ESHUT).

The Cities Forum on Environmentally Sustainable and Healthy Urban Transport (ESHUT) was held on 7 April 2010, in Manila, the Philippines. The forum was attended by 22 participants from seven countries and areas.

The objectives of the Cities Forum on Environmentally Sustainable and Healthy Urban Transport were:

1. to promote a win-win strategy (lowering the carbon footprint and protecting and promoting human health) for urban transport systems; and
2. to share experiences and best practices in health, urban transport and win-win solutions for climate change and transport.

The forum consisted of plenary presentations of ESHUT projects and activities in Asian cities and a visit to Marikina City, the Philippines.

Five cities in the Western Pacific Region (Changwon, the Republic of Korea; Marikina, the Philippines; Nagoya, Japan; Phnom Penh, Cambodia; and Seoul, the Republic of Korea) presented their reports as ESHUT project demonstration sites. Each presentation gave an assessment of the city’s existing urban transport system and its impact on health and the environment. Strategies, programmes and projects initiated by the city governments to resolve or mitigate the negative impacts of unhealthy urban transport and the good practices and lessons learnt during implementation were discussed extensively. The presentations concluded with statements on future actions needed to strengthen and sustain current ESHUT efforts. The city presentations were followed by an open forum, which generated several suggestions on how to sustain the different projects, including the critical role of other sectors and the importance of community support and political commitment to enforce regulations.

The visit to Marikina City showcased the commitment of the local government to provide the best possible health services to its citizens. A bicycle lane tour around the city centre, which highlighted the promotion and use of non-motorized vehicles as an alternative mode of transport, demonstrated the city’s commitment to ESHUT.

The forum concluded with the participants expressing the need to strengthen and sustain ESHUT initiatives, document good practices and lessons learnt, enhance technical cooperation, and expand networking among the cities.
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### Keywords

Climate change/Health promotion/Urban health/Urban transport
1. INTRODUCTION

1.1 Background

As WHO works to improve health within the overall context of social development, it is critical to organize technical support to countries that strengthens the way they are able to influence sectors outside health. With the rapid unplanned urbanization in the Western Pacific Region (more than 60% of the population are urban) and its impact on health, urban transport systems have significant implications for the health and safety of populations, who are affected by such factors as air and noise pollution and greenhouse gas (CO₂) emissions generated by motor vehicles; road traffic crashes; physical activity or inactivity; exposure to second-hand smoke in confined public transport systems; and lack of accessibility or barrier-free transport system for persons with disability and the elderly. Urban air pollution and road traffic crashes each currently account for some 300,000 deaths every year in the Region; obesity among urban populations, linked to sedentary lifestyles, is on the rise; and more than 50% of young people aged 13-15 are exposed to second-hand smoke in public places, including transport systems.

The transport sector is responsible for approximately 23% of the fossil-fuel-based greenhouse gas emissions that cause global warming, with road transport alone accounting for around 76% of total transport CO₂ emissions. However, it is the poorer countries that suffer most due to climate change, with estimated costs of 5%-9% of GDP for some. Without major efforts to address the air pollution and reduce greenhouse gas emissions from the transport sector, growing vehicle ownership and usage in developing countries, along with increasing urbanization and rising accident figures, will contribute to an undermining of human health, the urban environment, economic productivity and social equity. Road safety is a critical issue across the Region, and the economic losses caused by road accidents range from 2% to 3% of total GDP in most of the Region’s developing countries. Transport policy decisions made today will therefore have a profound impact on human and environmental security in coming decades.

In the last few years, the WHO Regional Office for the Western Pacific has been collaborating with the United Nations Centre for Regional Development (UNCRD) in developing a multisectoral (transport-environment-health sector) regional initiative to promote environmentally sustainable and healthy transport in Asia. UNCRD has established the Regional EST Forum, a strategic and knowledge-sharing platform for policy discussions on social, health, and environmental issues in the transport sector. The participation of health ministries/agencies in regional EST Forums, with the support of WHO, has strengthened policy consultations on public health and safety concerns in the urban transport sector.

The Environmentally Sustainable and Healthy Urban Transport (ESHUT) project is aimed at encouraging Healthy Cities to undertake bold and strategic measures to improve their urban transport systems and reduce related morbidity and mortality rates. The project is collaborating with the Alliance for Healthy Cities (AFHC) and its selected key city members to work towards excellence in policy and actions for healthy urban transport systems. These cities serve as models and demonstration sites for other urban areas in the Region and will be publicly recognized for their work by WHO and UNCRD.

Intersectoral efforts to address health and transport issues are crucial in achieving better health outcomes in cities. In support of the theme of World Health Day 2010 on urbanization and health, it was proposed that a forum of cities be convened to advocate for policy and action on ESHUT.
1.2 Objectives

The objectives of the Cities Forum on Environmentally Sustainable and Healthy Urban Transport were:

1. to promote a win-win strategy (lowering the carbon footprint and protecting and promoting human health) for urban transport systems; and
2. to share experiences and best practices in health, urban transport and win-win solutions for climate change and transport.

1.3 Participants

The forum was attended by 22 participants from seven countries and areas, namely: Cambodia (3); Japan (4); Malaysia (1); Mongolia (1); the Philippines (4); the Republic of Korea (8) and Viet Nam (1).

Four WHO staff members from the Regional Office for the Western Pacific and one from the WHO Centre for Health Development in Kobe, Japan, served as the Secretariat.

The list of participants, temporary advisers, observers and members of the Secretariat is presented in Annex 1.

1.4 Opening ceremony

The opening remarks were made by the Dr Shin Young-soo, WHO Regional Director for the Western Pacific. He greeted the participants and highlighted the relevance of environmentally sustainable and healthy urban transport initiatives in providing a pathway for healthy urbanization. Dr Han Tieru, Director, Healthy Communities and Populations, presented the forum overview and stated the objectives. The opening ceremony ended with the self-introduction of the participants.

The programme of activities is presented in Annex 2.

2. PROCEEDINGS

2.1 Presentations of ESHUT activities in Asian cities

The presentations and open forum were moderated by Mr Kazunobu Onogawa, Director, UNCRD and Dr Mario Villaverde, Technical Officer, Health Promotion, WHO Regional Office for the Western Pacific. Five cities in the Western Pacific Region (Changwon, the Republic of Korea; Marikina, the Philippines; Nagoya, Japan; Phnom Penh, Cambodia; Seoul, the Republic of Korea) presented their reports as ESHUT project demonstration sites.

2.1.1 Changwon, the Republic of Korea

Dr Boo Ouk Rhee, Director of Changwon Health Centre, presented on behalf of the city of Changwon, the Republic of Korea. He started with introduction of the demographic, geographic, business and industrial profiles of the city. The four key strategies for the ESHUT project in Changwon are: (1) increased physical activity and decreased sedentary living; (2) decreased use of private cars and enhanced use of public transport; (3) greening and redesigning of the city; and
(4) development and use of alternative energy. The project will specifically address making Changwon a “Special Cycling City.”

The main objective of the Special Cycling City initiative is for 20% of all transportation in the city to be carried out by bicycle by 2020. Three main strategies are being executed: (1) establishment of a bicycle-friendly infrastructure through connectivity of bicycle lanes, provision of public bicycles and establishment of bicycle centres; (2) setting up of policies for the safe and convenient use of bicycles through improvement of relevant laws and regulations; and (3) creation of an environment conducive to spontaneous participation through public education and promotion of bicycle use.

The establishment of a bicycle-friendly infrastructure is anchored on the public bicycle rental system, called the Nubija system, an acronym for “Nearby and Useful Bike, Interesting and Joyful Attraction.” The system will be established within a period of five years (2008-2012), with expected resources of 300 bicycle terminals and 5000 Nubija cycles. The system is the world’s first GPS-equipped, automated bicycle rental system. As of January 2010, there were 119 bicycle terminals and 2030 bicycles available 24 hours a day, seven days a week to those aged 15 years or older. Since its implementation, 75% of users have been satisfied or very satisfied with the system. Major effects of the Nubija system include: (1) environmental effects—energy savings amounting to US$ 1.7 million and a CO₂ reduction of 2696 tons; (2) personal effects—improved health through “active living” and savings in transportation costs; and (3) community effects—reinvigoration of bicycle-related industries, establishment of low-energy-consumption transportation, relief of traffic congestion and increased face-to-face contact in the community.

Support systems and infrastructures have been instituted to make the Nubija system efficient and sustainable. These include repair and construction of bicycle lanes, securing the connectivity of bicycle lanes, provision of signboards for bicycle safety, and establishment of the Bike Culture Centre to conduct bicycling classes, repair bicycles and promote bicycling. Various bicycling policies have also been instituted, such as bicycle insurance for citizens, allowances for workers commuting on bicycles, bicycling safety education, enforcement of bicycle registration, and rigid enforcement of regulations regarding illegal parking, among others. Active citizen participation has also been initiated through workshops, seminars, mass media campaigns, mobilization of bicycling groups and nongovernmental organizations, and bicycle festivals and parades.

Future development plans for the ESHUT project in the city include building an advanced infrastructure and traffic signals for bicycles, connecting bicycle lanes between the downtown area and surrounding rural areas, connecting bicycle networks along the Nakdong River and with the rest of the country, expanding the Nubija system, conducting annual bicycle parades and international bicycle festivals, and developing an integrated master plan for bicycling.

2.1.2 Marikina, the Philippines

Dr Alberto Herrera, City Health Officer of the City of Marikina, the Philippines, gave a presentation on behalf of the city government. He explained how Marikina City had become a recipient of a World Bank-Global Environment Facility (WB-GEF) grant amounting to USD 1.3 million in 2002 for a Bikeways Project to develop 66 kilometres of bicycle lanes within the city. The project had paved the way for the creation of the Marikina Bikeways Office, which spearheaded the development of Marikina as a bicycle-friendly city from 2002 to 2007 and increased the share of bicycles in the city’s traffic from 4.25% in 1999 to 9.55% in 2006. As an offshoot of the dissolution of the Marikina Bikeways Office in 2007, the sustainability of the bikeways programme had been identified as a major weakness, as indicated by the decline of bicycle use in 2007-2008.
Started in 2009, the ESHUT project entitled “Promoting Bicycle Use among Marikenos” is intended to increase the use of bicycles as an alternative mode of transport within the city. The focus was shifted from the bikeway development of the earlier WB-GEF project towards behavioural change or actual use of bicycles under the ESHUT project. Thus, most of the project activities have focused on increasing awareness and promoting bicycle use. At the start of the project, a traffic study was conducted to obtain baseline data on bicycle use, which noted the decline in bicycle use since 2007. Two factors were considered important in making bicycle use more appealing to the public: improving access from residential areas and safe engineering of the bikeways. As part of the “Bike to School” campaign, bicycle safety classes have been conducted in schools to make students aware of the benefits of bicycling, not just for personal health, but also for environmental protection. To improve access and use of bicycles among private employees, the city government has given financial assistance to a private company to provide bicycle loans to employees as part of the “Bike to Work” programme. Information and education materials on biking have also been developed and distributed.

To broaden participation in the advocacy campaign, a consultative meeting was held to re-orient bikers’ associations and other stakeholders on existing policies and common issues relevant to bicycle use in the city. The Marikina City Family Bike Festival was also conducted to create awareness among the general public on the benefits of bicycling as an alternative mode of transport. To support the advocacy campaign, a bicycle parking station has been constructed and existing bikeways and road signs rehabilitated. Enforcement of bikeway rules and regulations has been strengthened with the assignment of permanent staff from the City Transport Management and Development Office as the Bike Patrol Unit.

The following have been identified as key areas to continue the promotion of bicycle use in Marikina: (1) enactment of ordinance to create a Bikeways Enforcement Unit under the City Transport Management and Development Office; (2) construction of more bicycle parking stations in strategic areas, such as public transport terminals, public facilities and schools; (3) conduct of regular bicycle festivals for advocacy among the general public; and (4) expansion of the bicycle rental and bicycle loan programmes to increase access to and use of bicycles.

2.1.3 Nagoya, Japan

Mr Takayuki Hirao, Co-Director, Road Use Planning Department, Nagoya, Japan, gave a presentation on behalf of his city. He described Nagoya as a modern city with a long history, a well-developed public transport network and a well-maintained road network. Rapid urbanization, however, has increased the use of private vehicles and has caused pollution problems, with the transport sector accounting for 29% of total CO₂ emissions, much higher than the national average of 20%. In accordance with the ESHUT concept, the city has started several initiatives to reduce the use of private vehicles and improve public transport services to reduce CO₂ emissions. Examples include: (1) barrier-free design to enable all persons to travel safely in the city; (2) smoking prohibition in public transport vehicles and at stops; (3) advocacy of “eco-friendly driving”; and (4) car-free days.

One current issue requiring attention in Nagoya is the concentration of cars in the city centre, where traffic is three times heavier than the average for the city. As a response, the city decided to run a pilot community bicycle-sharing system (CBSS) in the city centre as part of the ESHUT strategy. A typical CBSS project consists of the following features: (1) bicycles can be picked up and returned at any time at any of the locations; (2) there is a high density of bicycle stations; (3) there are progressively higher rental charges to encourage short-time use; (4) unmanned rental management uses advanced electronic systems; and (5) there is careful maintenance of bicycles.
In Nagoya, it was initially decided to make community bicycles available to all registered users free of charge to enable as many people as possible to learn from experience. Two features were unique in the Nagoya pilot programme: (1) the use, not only of public road spaces and parks, but also privately owned land for bicycle stations; and (2) the repair and use of illegally parked or abandoned bicycles as part of the fleet of community bicycles, with the objective of making the bicycle-sharing system a true community project. As a result, the popularity of the CBSS experiment rose sharply, with the number of registered users reaching 10,000 by the tenth day and 30,974 at the end of two months, showing success in achieving the aim of letting as many people as possible learn about the CBSS. With the rising popularity of the programme, the service frequency increased from around 1000 per day during the first week to 2500 per day towards the end of the pilot run, meaning a single bicycle was rented out more than eight times a day on average. The average duration of use for a bicycle started at about one hour in the beginning but fell below 30 minutes by the end of the pilot, indicating efficient sharing of bicycles for short periods to cover short distances. People more often used the CBSS for business and personal affairs, showing that the system was being used by citizens as part of their daily lives. The CBSS was also found to complement the existing public transport system and to attract more people to the downtown area, thus helping revitalize the local community.

By starting up the CBSS in the city centre and ensuring good connectivity with the existing public transport system, the overall convenience of the public transport system has been improved and a shift from private cars to public transport has been promoted. The next steps for the programme consist of automating the rental procedures and introducing rental charges to reduce running costs. There is also a need to improve the bicycling environment by setting up bicycle lanes and teaching people about bicycling rules.

2.1.4 Phnom Penh, Cambodia

Dr Mean-Heng Ngy, Deputy Director of Phnom Penh Municipal Health Department, gave a presentation on behalf of Phnom Penh Municipality. He started by describing the new era of development in Cambodia and the increasing concerns about environmental issues and traffic problems, particularly in the city of Phnom Penh. The causes have been attributed to two key factors: loss of semi-natural vegetation and the ever-increasing number of motor vehicles in the city. Motor vehicles, not only cause frequent traffic jams during peak hours, but also emit a considerable quantity of carbon dioxide and other pollutants. The rapid urbanization of the city also means the loss of semi-natural ecosystems, such as agricultural lands. In response to these concerns, the government of Phnom Penh Municipality has conducted initiatives to: (1) expand green spaces through the construction or renovation of more gardens and parks within the city; (2) promote tree planting alongside major roads, and (3) conduct an awareness programme on the benefits of bicycling.

The green space project is part of the development agenda for the city. The rationale behind the project is to reduce urban heat build-up, improve air quality, reduce sound pollution and protect water quality. Priority has been given to the construction of parks and gardens along the Tonle Sap River, parallel to Preah Sisovath Boulevard. The design of gardens and parks has allowed for multipurpose use by visitors, ranging from physical activities (such as exercising, walking, jogging, etc.) to passive pursuits (such as picnicking, social activity, nature viewing along the river, etc.). To date, the green space project has converted around 57 hectares of the city into parks and gardens.

As part of the green agenda, tree planting along major roads in the city has also been given priority, the main objectives being to beautify the city landscape, reduce noise from motor vehicles, and absorb carbon dioxide and other pollutants. As residents have gained a better understanding of the benefits of planting trees, it has become common to see city residents
voluntarily planting trees alongside the roads fronting their houses, and most major roads in Phnom Penh now have trees planted on the roadside.

The 2008 census revealed that there were three times as many motorists as cyclists. More motor vehicles on the roads, not only makes traffic worse, but also causes pollution that lead to harmful health effects. To reverse the trend, bicycling is being promoted, particularly for short distance travel. The intended impacts of this project are to increase fitness and weight loss and to reduce stress among citizens and, at the start, a meeting to promote ESHUT was organized at the Chamcamorn Referral Hospital to raise awareness about the benefits of bicycling. At the end of the meeting, participants were invited on a bicycling tour. The initiative to promote bicycling is still in its infancy and it is too early to assess its impact.

The next steps for the city are: building and renovating more gardens and parks; promoting more tree-planting activities along major roads; and promoting more use of bicycles as a means of transportation within the city.

2.1.5 Seoul, the Republic of Korea

Ms Hee Kim Soon, Deputy Director of Health, Office of Policy on Women and Families, spoke on behalf of the City Government of Seoul, the Republic of Korea. She described the population growth of the Seoul Metropolitan Area, the economic growth in the 1990s and the resultant increase in family income that had led to the surge in the number of automobiles in the city. The heavy increase in vehicular traffic, coupled with limitations in provision of roads, resulted in exacerbation of traffic congestion and emissions of air pollutants. Resolution of this key issue was considered critical to enhance the city’s competitiveness and to create a sustainable and healthy city.

In response, there was a paradigm shift in policy framework: (1) from a fossil-fuel-dependent to low-carbon-based transportation system; (2) from a vehicle-oriented to human-oriented transportation environment; and (3) from supply-oriented to high-quality, service-oriented transport management. The goals and objectives of the new policy framework were: (1) to provide a decent public transport service, thereby reducing the demand for private cars; and (2) to create an eco-friendly and pedestrian-centred transport environment, thereby establishing a sustainable transport system.

The first component of the project was to make the privately operated bus system into a semi-public system, based on joint management of income from bus fares and bidding for bus routes. This enabled buses to go to areas lacking in public transportation, thus making the bus system citizen-friendly. To support this scheme, the route system was reformed, linking the subway and bus system with no break in the public transport system, thereby streamlining long-distance, overlapping and unnecessary routes. The colour and number systems by bus route type were also changed, and an integrated distance-based fare system and a new transportation card were introduced, enabling much easier transfers from bus to bus, bus to subway, or subway to subway. Transportation reform was further enhanced by an integrated bus management and bus information system and the introduction of the median bus lane and high-quality buses. The improved speed and convenience of the new system led to increases bus passenger numbers, higher revenues, higher citizen satisfaction and lower numbers of accidents.

The second component of the project dealt with upgrading mass transit services, including: expanding the railway network; improving subway stations and platforms; expanding the fare system in the entire metropolitan area; improving bus shelters; and banning smoking at bus stops. The third component of the project was building an eco-friendly and people-centred transportation system by encouraging less use of cars and making better use of public transport. In addition, the
City Government implemented a weekly no-driving day and overhauled the road system to provide a pleasant walking network, thereby reducing the demand for transportation; walkways and parks were restored to provide more space for the public; and old buses and taxis were replaced in phases by “green” transportation, such as electric, electronic and hybrid vehicles.

Future plans include expanding citizen participation in the planning, implementation and operation of the transport process and forming citizens’ committees for bus reform and walkway and park restoration. The City Government also plan to expand the concept by exporting public transport administration services and sharing the lessons learnt with other cities.

Country presentations are presented as Annex 3.

2.2 Open forum

There was an exchange of experiences and lessons learnt among the participants regarding short-term and long-term activities and solutions related to ESHUT projects. Suggestions on how such projects can be sustained included expanding partnerships and collaborative efforts with other sectors, including business groups, nongovernmental organizations and civic groups. The critical role of the community was also emphasized to ensure that ESHUT projects have support at the local level. The political commitment of local officials is also crucial, particularly in the enactment and enforcement of rules and regulations.

Mr James Chan Khay Syn, Mayor of Kuching South, Malaysia, shared details of his city’s urban transport project. This involves road improvement projects consisting of widening major roads and upgrading traffic signals in the city to increase traffic capacity and reduce congestion. Improvement of public transportation has been started by procuring new air-conditioned buses with special facilities for the handicapped and the elderly. The use of alternative modes of transportation, such as air-conditioned river ferries, is also being introduced. Another component of the project is the improvement of pedestrian facilities through construction of footpaths and pedestrian crossings that cater to the visually-impaired and the handicapped. Security measures for pedestrians are also being improved, such as installation of a CCTV surveillance system and upgrading of streetlighting.

Mr Mai Van Loc, Deputy Secretariat, Urban Transportation and Environment Office in Hue City, Viet Nam, also shared details of his city’s project on urban transport and sustainable environment. He explained that Hue City is the ancient capital of Viet Nam and there is a need to protect its natural landscape and historical sites, making it difficult to extend the road network within the city. To resolve this issue, projects carried out consist of eco-tour activities, reserving “walking streets” for tourism in the city centre and using electric cars in the Royal Citadel. There has also been resettlement of boat people living on the Huong River and clearing of the Royal River Area. The City Government has also proposed policies to restrict traffic in the inner city and development of green areas to isolate certain parts of the city from noise, dust, smoke and other pollutants.

The presentations of Malaysia and Viet Nam are presented as Annex 4.

2.3 Visit to Marikina City

The visit to Marikina, one of the cities comprising the Metropolitan Manila area, started with a courtesy call to local officials and a tour of the City Hall. A video presentation, “Marikina: The City in the Pink of Health”, was shown to provide an overview of the city and the programmes and projects related to health and ESHUT.
A visit to the Marikina Healthy City Center showcased the commitment of local government to providing the best possible health services to its citizens. Among the services provided by the centre are health exhibits and educational forums, general medical and dental services, specialty clinics, health services for the elderly and young people, rehabilitation services for differently-abled persons, blood donation services, nutrition counselling and family planning services.

A bicycle lane tour around the city centre showcased the city's commitment to ESHUT. Marikina City prides itself on having a 52 kilometre bicycle network, the longest in the Philippines. The network conveniently connects residential areas to schools, markets, workplaces, health facilities, government offices, parks and recreational areas, and light rail transit stations. The aim is to promote the use of non-motorized transport by encouraging young people to cycle to school and employees to cycle to work. The scheme is intended to alleviate air and noise pollution and traffic congestion within the city.

3. CONCLUSIONS

The participants expressed the need to strengthen and sustain ESHUT efforts and enhance technical cooperation and networking among cities.

The participants also supported the incorporation of documentation regarding the experiences and lessons learnt in the five pilot cities into the draft ESHUT Primer.
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AGENDA

1. Opening session
2. Overview and objectives
3. Presentation of the Environmentally Sustainable and Healthy Urban Transport (ESHUT) activities in Asian cities
   - Changwon, Republic of Korea
   - Marikina, Philippines
   - Nagoya, Japan
   - Phnom Penh, Cambodia
   - Seoul, Republic of Korea
4. Open forum
5. Exchange visit to Marikina City
4. Execution

Reinvigoration of local economy through jobs created from expansion of bicycle-related industries
- Manpower needed for manufacturing & production of bicycle facilities: 300 persons at seven companies
- Manpower required for constructing bicycle terminals: 3,200 persons/year (100 locations)
- Manpower needed for management of bicycle service: about 150 persons
- Established a foundation for low-energy commuting transportation
- Came into spotlight as a new means of transportation for short-distance travel at night (23:00 to 05:00) 12% of total usage
- Revitalized local community through increase in face-to-face contact
- Reduced air-pollution and relieved traffic congestion
4. Execution

- Conducted safety training on bicycles for transport workers (700 trained)
- Conducted safety training on bicycles for schools (150 elementary and middle school students)

Development of educational movement on voluntary bicycle-riding and environmental consciousness

- Launch of "Guardians of Nubija by Samsung Techwin"
- Main activities: Providing services at major Nubija terminal downtown

6. Outcomes of cycling policy

- State of citizen bike holding: 0.79 / home hold
- Survey of cycling movement & climate: 10.4% positive, 82.2% compliant in 2008
- 3rd Korean Bike Festival / 30 x 3
  - Making of citizen's pride as a cycling city & spreading of cycling movement to whole society
  - Building & running of public bicycle system in a mission
  - Break of direct vehicle stress with such as cycling of energy & reduction of CO2
  - Promotion of new green public transportation

Future Development Plan

- Building of well-advanced cycling system for blue river park
- Improvement of cycling system of surrounding area
- Improvement of cycling service with making a world leading city

Changwon
"Promoting Bicycle Use Among Marikenos"
(The Marikina ESHUT Project)

Mayor Maria Lourdes C. Fernando
City Mayor

The Bikeways Project
Marikina: Recipient of the WB-GEF Grant

- WB-GEF grant of US$1.3 M in 2002 for the development of 66 kilometers of bicycle lanes

Removing the barriers to non-motorized transport

Bicycle Use in the City

<table>
<thead>
<tr>
<th>Year</th>
<th>1995</th>
<th>2002</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Bicycle</td>
<td>6.2%</td>
<td>6.8%</td>
<td>7.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>7.1%</td>
</tr>
</tbody>
</table>
ESHUT Project Components

- Evaluation of bikeways use: Traffic Count
- Productions and distribution of IEC materials
- Bike Loan Project
- Classes on safe bicycle use
- Advocacy event: Major cycling event
- Bikeways rehabilitation
- Bicycle Parking Station
- Consultative meeting with bikers
- Strengthening the enforcement of bikeways rules and regulations

Traffic Count Results

<table>
<thead>
<tr>
<th>Intersection</th>
<th>1999</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.P. Rizal-Sumulong</td>
<td>3.71</td>
<td>7.44</td>
<td>5.50</td>
</tr>
<tr>
<td>Shoe Ave-Sumulong</td>
<td>3.86</td>
<td>8.36</td>
<td>5.34</td>
</tr>
<tr>
<td>Bayan-Bayanan-Molave</td>
<td>2.37</td>
<td>3.50</td>
<td>3.64</td>
</tr>
<tr>
<td>J.P. Rizal-N. Reos</td>
<td>5.74</td>
<td>9.07</td>
<td>7.36</td>
</tr>
<tr>
<td>Gil Fernando-Sumulong</td>
<td>3.65</td>
<td>8.94</td>
<td>4.74</td>
</tr>
<tr>
<td>J.P. Rizal-BG Molina</td>
<td>3.85</td>
<td>9.15</td>
<td>4.27</td>
</tr>
<tr>
<td>J.P. Rizal-Farmers 1</td>
<td>11.52</td>
<td>9.65</td>
<td>16.18</td>
</tr>
<tr>
<td>Lilac-Panorama</td>
<td>2.87</td>
<td>5.84</td>
<td>7.36</td>
</tr>
<tr>
<td>J.P. Rizal-Bayun-bayan</td>
<td>6.89</td>
<td>15.11</td>
<td>12.62</td>
</tr>
<tr>
<td>CITYWIDE</td>
<td>4.25</td>
<td>8.00</td>
<td>7.93</td>
</tr>
</tbody>
</table>

Bike Loan Project

- Replicate Marikina City's good practice in a private company
- Initial 36 recipients from Advance Food Concepts Manufacturing, Inc.
Bike Loan Project

Bike Safety Classes

Bikeways Rehabilitation

Bikeways Rehabilitation

Bicycle Parking Station

Bicycle Parking Station
Consultative Meeting with Bikers

Strengthening Enforcement

Bicycle use...
a viable alternative to motorized transport
advocacy, community participation, and mobilization are vital
ESHUT revitalized the Bikeways program of the City
Next Steps

- Creation of a Bikeways Enforcement Unit under the CTMDO
- Construction of more bicycle parking stations
- Regular bicycle festival in the city
- Bike loan and bicycle rental

"Promoting Bicycle Use Among Marikeños"
(The Marikina ESHUT Project)

visit www.marikina.gov.ph
NAGoya CITY, JAPAN

Nagoya's Strategy for Environmentally Sustainable and Healthy Urban Transport

April 7, 2010

Nagoya is in the center of Japan.

Well-developed Public Transportation Networks

Well-maintained Road Networks

Nagoya: Excellent Development of Both Roads and Railways
Promoting the Use of Railways for Reducing CO₂ Emissions

Concentration of Automobile Traffic in the City Center

A Vision Concerning the City Center Traffic (Control of the Inflow of Automobiles and Increasing the Ease of Strolling around the City Center)

Downtown streets can provide space for pedestrians.

Use of Bicycles to Complement Walking

Photograph courtesy of I. Takaya, Kobe, Japan.
Activities of Environmentally Sustainable and Healthy Urban Transportation in Phnom Penh, Cambodia

Prepared by Phnom Penh Healthy City Committee, March 2010

Contents
• Renovation of gardens/parks
• Practicing physical exercises at the parks
• Promotion on trees planting along the roads
• Promotion on using bicycle for short distance travel

Garden Construction

Renovation of Garden along Tonle Sap River

Renovation of Garden along Tonle Sap River (Cont.)

Renovation of Garden along Tonle Sap River (Cont.)
Renovated Garden along Tonle Sap River
Practicing physical activities at the park

Meeting on Promotion of Environmentally Sustainable and Healthy Urban Transportation,
20th March 2010, Phnom Penh, Cambodia
Presided by Mr. NUON Someth, Chief of Phnom Penh Municipality

Promotion of Trees Planting along the roads

Meeting on Promotion of ESHUT, Biking Campaign
Meeting on Promotion of ESHUT Biking Campaign

Meeting on Promotion of ESHUT Biking Campaign, gathering at Wat Phnom

Meeting on Promotion of ESHUT Biking Campaign, return to Independent Monument

Actions in the future

- Continue building up and renovating parks
- Promoting the trees planting along the roads
- Encourage residents to biking for short distance travel (and using helmet)

Thank for your attention
Seoul's Challenges & Achievements
for Environmentally Sustainable Healthy Urban Transport

7 April, 2010
Seoul Metropolitan Government

Contents
01 Introduction
02 Changes in policy framework and a new target
03 Efforts by city of Seoul for ESHUT
New Challenges and Achievements, Transportation reform
Upgrading Mass Transit Service
Eco-friendly and Human-oriented Transportation system
04 Conclusion and Proposal

1. Background

Introduction

2. Changes in Seoul's Transportation Condition

- No. of registered cars increased rapidly—limited expansion of roads
  - Income level, No. of car ownership
  - Length of road: 8,102 km (about 1,500 km increased from that of 1980)
  - Rate of road expansion: 22.6%

Increase in Vehicle Registration & Road Extensions (1980-2010)
2. Changes in Seoul's Transportation Condition

Public transportation-oriented transit system
- Subway: Opening line 1 (1971), 7.7 km, 9 stations - Present: 12 lines (215 km), 209 stations
- No. of passengers (ave.): 6.7 million

Subway Map

Transportation Conditions
- No. of lines: 3, 9 million/day
- Modal share: Bus 27.9%, Metro 30.2%, Passenger car 25.9%, Taxi 6.2%
- Average Speed - Passenger car: 11.3 km/h (average), 24 km/h (total area)
- Bus: 19.7 km/h, 25.9 km/h (median bus travel)

A Shift in Travel Speed & Traffic Congestion Cost in Seoul (1986-2006)

Traffic Congestion Costs (1986-2006) - $ billions

Air pollution emissions - status
- PM2.5 density in Seoul (2009) - 54.6 mg/m³, lower than national environmental quality standard and WHO standard

Air pollution emissions - current status
- PM10, NO2, CO

Traffic congestion, resultant air pollution
- 79.4% of PM10, 63.8% of NO2, 88.8% of CO = main cause of air pollution
- PM2.5 from car is more serious than general dust
- People in a car are exposed 20% more than bus passengers (University of Auckland, New Zealand, etc.)

Air Pollution Emission - Current Status

<table>
<thead>
<tr>
<th>Emission</th>
<th>PM10</th>
<th>NO2</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>42</td>
<td>43</td>
<td>23</td>
</tr>
<tr>
<td>Transportation (Car)</td>
<td>(895)</td>
<td>(262)</td>
<td>(794)</td>
</tr>
<tr>
<td>Subway</td>
<td>293</td>
<td>43</td>
<td>23</td>
</tr>
<tr>
<td>Bus</td>
<td>65</td>
<td>43</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: National Air Pollution Emission in 2009, and 2009 National Institute of Environmental Research
EXPECTING

- Research on policies and measures to limit the protection of urban environment has the effect of the developed or developing world: through this forum organized by the WHO,
- Study and Exchange the experience about the impact on Urban Transport Environment from another Countries.
- Research effect Policies and Measures which have the aim of minimizing the urban environment pollution by transport that effecting the Development of City.

THANK YOU!

ACTIVITIES OF FESTIVAL-HUE SITES
URBAN TRANSPORTATION PLANNING

- In Thua Thien Hue Province:
  - National Road No. 1A (actually, passing through Hue City), Expressway to the West, Highway along the Coast (the East), North-South High-speed Railroad, Car Parking Areas...
  - Projects have been studied,
- Problems: Lack of transport infrastructure, Environmental pollution,

CITY NET OF THUA THIEN HUE PROVINCE PLAN

MASTER PLAN OF HUE CITY IN 1997-2020

- Projects Carried Out
  - The Walking Streets reserved for tourism in the Centre City;
  - The pilot Project of Electric Cars in the Royal Citadel;
  - Implementing in 2009 - 2010: Resettlement Hue boat people who live on the Huong River Projects (1,069 households) and Remove and clearance Royal River Area (in The Royal Citadel);

PROPOSAL SOLUTIONS

- Planning Projects oriented: Green City, Garden House City, Greenery Areas isolate from new modern transportation system to limit noise, dust, air pollution, smoke...
- Measuring on urban transport for management environmental protection: the engines of the automobile have been reached Environmental Standard Euro 2, Public Transports use electric motors, batteries, etc., Policies restricted the traffic inner City, Housing Areas...
- Encouraging the participation of citizen communities in environmental protection and the role of local government for limiting Urban Environment Pollution, Traffic Jams.

PROJECTS CARRIED OUT

- The Walking Streets reserved for tourism in the Centre City;
- The pilot Project of Electric Cars in the Royal Citadel;
- Implementing in 2009 - 2010: Resettlement Hue boat people who live on the Huong River Projects (1,069 households) and Remove and clearance Royal River Area (in The Royal Citadel);

ECO-TOURS ACTIVITIES
HUE CITY, VIETNAM

HUE CITY - THUA THIEN HUE PROVINCE
IN VIETNAM

URBAN TRANSPORT AND SUSTAINABLE ENVIRONMENT FOR DEVELOPMENT

EAST-WEST ECONOMIC CORRIDOR IN SOUTH EAST ASIA

- Corridor links International Border Gates: Lao Bao, Hong Van, Ku Tai, A Dot... and East Sea via Chan May Deep-sea Port.
- The North-South Railroad passing by the Hue City, 1,000kms, 108kms and 675kms apart from HCM City, Da Nang City to the South and Hanoi Capital of Vietnam to the North.

KEY ECONOMIC REGION OF CENTRAL VIETNAM

- Key Economic Region of Central VN including the Provinces: Thua Thien Hue, Danang City, Quang Nam, Quang Ngai, and Gia Din.
- Road way and railway located on the Irina-Vietnam.
- Waterway: Thu An Port is 12km far from Hue City.
- Chan May Deep-sea Port, 60km from Hue City, allows commodity ships of 30,000 tons of load and large international tourist ships land.

SOCIO-ECONOMIC OF HUE CITY

- Historical Monuments and Relics of Hue ancient Capital and Royal Music were listed by UNESCO as the World Cultural Heritage.
- Harmonious environment, natural sightseeing and heritage sites include: "the Green City", "the City of Garden Houses", "the City of Festivals", etc.
- Economic structure orientation is Tourism - Services & Industry - Small Handicraft.

URBAN ENVIRONMENTAL IMPACT AND TRANSPORTATION SYSTEMS OF HUE CITY

- Transport System is still developing as 1st Ranked City: Highways, Express Railroad, Parking Areas, Housing Streets... Public Transport Facilities.
- The Environmental Impact of Residential Areas cause of Housing, public service offices built along National Highways; Affected by: noise, dust, polluted air from exhaust fumes of vehicles, Risk of traffic accidents.
- To protect Natural Landscapes and Historical Remains: Hard to extend Network of roads in the City.
(4) (B) IMPROVEMENT OF PEDESTRIAN FACILITIES

- Upgrading of streetlighting by installing additional decorative lighting
- Installation of CCTV surveillance system to improve security
- Installation of barriers / landscape between footpaths and the road to discourage snatch thieves

SUMMARY

- Transportation within Kuching City still sustainable, manageable and friendly
- Planning to balance development against population and vehicle growth
- Council of the City of Kuching South extend its warmest invitation to you all to visit our beautiful and friendly city

THANK YOU
(4) (A) IMPROVEMENT OF PEDESTRIAN FACILITIES

- SUBMITTED FOR FUNDING FROM STATE / FEDERAL GOVERNMENT UNDER THE 10TH MALAYSIA PLAN FOR IMPROVEMENT OF PEDESTRIAN FACILITIES AT CBD AREA AND CONSTRUCTION OF 2 OVERHEAD BRIDGES
- SCOPE OF IMPROVEMENT WORKS TO THE CBD AREA INVOLVES
  - RECONSTRUCTION OF FOOTPATHS WITH LOW KERBS, HANDICAPPED FRIENDLY RAMPS AND TACTILE AND GUIDING BLOCKS TO CATER FOR THE VISUALLY IMPAIRED
  - PROVISION OF ADDITIONAL PEDESTRIAN CROSSINGS AND SPECIAL PARKING BAYS FOR THE DISABLED
(3) INTRODUCTION OF ALTERNATIVE TRANSPORT MODE

- Working with state government to introduce river ferry and taxi services
- Proposed initial route along Sungai Sarawak from Batu Kawa to Sintawa via the city centre with stops at Satok Bridge, Gambier Street, Grand Margarita, Wisma Mahmud with possible extension to Borneo Convention Centre
- 30 - 40 seats airconditioned vessels of river ferries are to be used
ESTIMATED 2020 TRAVEL CONDITIONS
- CAR OWNERSHIP TO INCREASE TWO AND A HALF TIMES EXISTING LEVELS
- OVERALL DAILY TRAFFIC TO DOUBLE
- AVERAGE SPEED TO BE REDUCED BY 50% FROM CURRENT LEVELS TO 10 KM/HR
- PROBLEMATIC JUNCTIONS TO INCREASE EIGHT FOLD
- MOST OF THE CORRIDORS ACCESSING THE CBD TO OPERATE CLOSE TO CAPACITY RESULTING IN LONG DELAYS AND QUEUES
- AVERAGE URBAN TRIPS TO TAKE THREE TIMES AS LONG AS EXISTING TRAVEL TIMES
- PUBLIC TRANSPORT DAILY MODE SHARE TO REDUCE TO 19%

NEGATIVE EFFECTS OF TRAFFIC CONGESTION
- WASTING TIME OF MOTORISTS AND PASSENGERS
- LATE ARRIVAL FOR MEETINGS, APPOINTMENTS ETC.
- INABILITY TO FORECAST TRAVEL TIME ACCURATELY
- WASTING FUEL AND INCREASING AIR POLLUTION
- WEAR AND TEAR OF VEHICLES
- STRESSED AND FRUSTRATED MOTORISTS
- INTERFERE WITH MOVEMENT OF EMERGENCY VEHICLES

MBKS STRATEGIES (2011 TO 2015)
1. JUNCTION AND ROAD IMPROVEMENT
2. ENHANCEMENT OF PUBLIC TRANSPORT
3. INTRODUCTION OF ALTERNATIVE PUBLIC TRANSPORT MODE
4. IMPROVEMENT OF PEDESTRIAN FACILITIES

(1) JUNCTION AND ROAD IMPROVEMENT
- SUBMITTED FOR FUNDING AMOUNTING TO RM78 MILLION FROM FEDERAL / STATE GOVERNMENT UNDER 10TH MALAYSIA PLAN
- ROAD IMPROVEMENT PROJECTS INVOLVED WIDENING OF 8 MAJOR ROADS IN THE CITY TO INCREASE TRAFFIC CAPACITY AND REDUCE TRAFFIC CONGESTION AT A COST OF RM44 MILLION AND RM31.5 MILLION ON IMPROVEMENT OF MINOR ROADS
- JUNCTION IMPROVEMENT INVOLVING UPGRADING OF JUNCTIONS WITH SERIOUS DELAYS TO TRAFFIC LIGHT SIGNAL CONTROLLED JUNCTIONS AT A COST OF RM2.5 MILLION

(2) ENHANCEMENT OF PUBLIC TRANSPORT
A. WEAKNESS
- AGE AND CONDITION OF EXISTING BUS FLEETS ARE UNSATISFACTORY
- SERVICE FREQUENCIES AND NETWORK COVERAGE SUBSTANDARD
- LACK OF TRANSPORT INFORMATION
- TERMINAL FACILITIES POOR

WORKING CLOSELY WITH THE STATE GOVERNMENT TO INTRODUCE NEW AIRCONDITIONED BUSES WITH SPECIAL FACILITIES FOR THE HANDICAPPED AND THE AGED
- SUBMITTED FOR FUNDING AMOUNTING TO RM13 MILLION FROM STATE / FEDERAL GOVERNMENT UNDER 10TH MALAYSIA PLAN TO IMPROVE PUBLIC TRANSPORT FACILITIES

PROPOSED PROJECTS
- BUS LANES ALONG JALAN ABELL AND PADUNGAN ROUNDABOUT TO CROWNE SQUARE
- BUS QUEUE JUMPERS AND BUS SIGNAL PRIORITY
- IMPROVEMENT OF BUS SHEDS AND CONSTRUCTION ADDITIONAL BUS SHEDS
KUCHING, MALAYSIA

BACKGROUND

KUCHING POPULATION GROWTH
- GROWING AT AVERAGE RATE OF 3.3%
  - YEAR 1991 - 370,000
  - YEAR 2005 - 440,000
  - YEAR 2020 - 800,000

EXISTING TRAFFIC CONDITIONS
- AVERAGE SPEED DURING PEAK HOURS IS 20 KM / HR
- 13 JUNCTIONS WITH LONG QUEUES AND DELAYS OF GREATER THAN 5 MINUTES
- PUBLIC TRANSPORT MODE SHARE IS CURRENTLY 13.3% WITH 85% OF PASSENGERS USING BUS MODE

VEHICLE GROWTH
- EXISTING CAR OWNERSHIP 1.00 CARS / HOUSEHOLD
- GROWING AT AVERAGE RATE OF 6.2% PER ANNUM & FOR EVERY 1% INCREASE IN POPULATION THERE HAS BEEN A 2% INCREASE IN VEHICLE REGISTRATION
  - YEAR 2000 - 136,000 MOTORCARS AND PRIVATE VANS
  - 152,000 MOTORCYCLES
  - YEAR 2005 - 183,722 MOTORCARS AND PRIVATE VANS
  - 205,337 MOTORCYCLES
  - YEAR 2010 - 248,190 MOTORCARS AND PRIVATE VANS
  - 277,389 MOTORCYCLES
Successful achievements of Seoul
- Unilateral direction and implementation
  - "Seoul, city of public transportation and pedestrian oriented traffic environment"
  - Facility and service improvement, regulation reform
- Expanding citizens' participation
  - Help citizens joining to planning, implementing and operating process
  - Citizens' committee for our reformation and Cheonggyecheon revitalization

Strategies for EKUHT
- Specific plan for environmentally-friendly, healthy city
- Make a realistic plan based on city's condition
- Form social consensus
2. Upgrading of Mass Transit Services

Smoking banned bus stop
- Operating in a few test spots: 6 places
- 30 May - 31 August 2007
- 72.3% of citizens were satisfied, 89% wanted to have all bus stops smoke-free
- cases of smoking on bus 12 (dropped 36.1%)
- the cases of smoking were found to have dropped 53% in a survey three months after removing the smoke-free zone.

3. Eco-friendly transportation

Car oriented - pedestrian oriented

Bus stop with a smoking ban

Weekly no-driving day
- Target: Cars with less than 10-passenger capacity
- Measures: PM reduction in annual registration tax, 6% reduction of fine at public parking lots
- Effect: 11% decrease in traffic volume, 3% increase in travel speed
- Reduction of Air Pollutant: PM 2.5: 6% PM 10: 5% CO: 8%

Low pollutant emissions mandatory in cars
- 3rd Target: Large, aged diesel cars
- Installation of DPF (Diesel Particulate Filters), conversion of LPG engines, early scrapping of old cars

Greenhouse gas reduction
- More than 30% reduction in CO2 emissions
- More than 50% reduction in NOx emissions
- More than 50% reduction in PM emissions

Renewable energy and RE vehicles
- Promotion of electric or hybrid cars
- Introduction of electric vehicle (March 2020)
- Pilot operation of online e-vehicle
- Promote use of electronic vehicle

Green transportation
- Electric all-electric bus fleet (about 200 buses)
- 7,000 buses (90%) were already replaced
- 10,000 electric or hybrid buses
- Pilot operation of online e-vehicle (March 2020)
- Promote use of electronic vehicle

All vehicles with electronic systems including hybrid and electric
1. Transportation Reform

- Major Achievement:
  - No. of passengers, Revenue, Accidents, Citizen's satisfaction
  - Social benefits $1.4 billion by next 10 years

2. Upgrading of Mass Transit Services

- Safe and pleasant subway
  - Installation of platform doors at all stations
  - Prevent accidents, improve air quality, reduce noise of air conditioner
  - Improvement in air quality
  - Conversion of platform doors to remote
  - Upgrading ventilation system and using high-pressure water jets to eliminate pollutants

- Expansion of median bus lane
  - Establishing a 231-km network of 19 corridors
  - Connect with 22 corridors of BRT in Metropolitan area

- Expansion of railroad network
  - LRT construction for low transit service areas
  - Introducing 10-Year Master Plan for Urban Railroad

- Convenience of bus stop
  - In-Metro: connect IT technology and weather sensors
  - Information on the local area, traffic, weather, and air quality updates as well as bus arrival time
  - Introducing heating systems, near infrared, and electric heaters and heated benches

- Completion of integrated fare system in Metropolitan area
1. Transportation reform

- Reorganized bus routes and numbering system
- New fare system, new card system
- High-quality buses

- New fare system, new card system
  - Integrated distance-based fare system
  - Free transfer between bus/sub and subway, free transfer within 30 minutes (maximum 5 times)
  - New smart card system strengthening security and compatibility

- High-quality buses
  - CNG buses
  - High capacity articulated buses
  - Low-floor buses

- Media Bus lane
  - For faster and reliable bus operation
  - To improve passengers' convenience by comfortable shelter, transfer center

- BMS (Bus Management System) & BIS (Bus Information System)
  - Real-time transportation information service
  - Bus stop waiting system

- Road Speed/traffic Information service (For Urban)
  - BMS Center
  - Bus Company
  - BMS (Bus Management System) & BIS (Bus Information System)
1. Changes in Policy Framework

- Low-emission transport system
- Human-oriented transport environment
- Integrated transit demand management

2. Goals and Objectives of Transportation Policy

- Seoul, a Clean Attractive Global City
- Sustainable transportation in Seoul

3. Efforts of City of Seoul for ESWW

- Transportation Reform
- Upgrading Mass Transit Services
- Eco-friendly, human-oriented transportation system

4. Transportation Reform

- Background - Limits & Problems
  - Urban and Suburban Development
  - Traffic Increase
  - Infrastructure Costs
  - Urban Area Development
  - 500-800 million yen
  - Long Construction Time: 5-10 years

- Background - Semi-Public Transportation System
  - Government: Operational plan, Infrastructure
  - Bus company: Operation and maintenance, Labor management

- Vicious Circle
  - Low-effective management of reserve pool

5. Transportation Reform

- Where do we have to go?
- Public Transportation Reform
  - Not a Choice but a Must