



Environmentally Sustainable Transport for Asian Cities: A Sourcebook



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Environmentally Sustainable Transport for Asian Cities: A Sourcebook (Revised edition)

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Front cover (Kunming, China) and back cover (Kyoto, Japan) photos by Lloyd Wright.

Preface

Effective access and mobility is a basis for making sustainable human development a reality. In Asia today, though, as the streets become increasingly congested and contaminated, the strides being made in economic development are at risk. The uncontrolled growth of cars and motorcycles has undermined human health, urban environmental quality, economic productivity, and social equity.

This Sourcebook on Environmentally Sustainable Transport for Asian Cities seeks to offer an alternative to the current mobility form of urban centres that are increasingly chaotic, dangerous, unhealthy, and environmentally damaging. Measures and practices such as efficient public transport, quality public space and cycleways, and prudent restrictions on private motorised vehicles have proven effective in not only reducing the negative impacts of unsustainable transport but also in providing a means to improve the basic quality of human life.

This document highlights the best practice in Environmentally Sustainable Transport as evidenced by the efforts of leading cities in Asia such as Hong Kong, Seoul, Singapore, and Tokyo. Additionally, this document builds upon the body of knowledge and leadership shown in examples globally, including Amsterdam, Bogotá, Brisbane, Copenhagen, Curitiba, Guayaquil, Rouen, and Zurich.

Beginning in 2004 with the development of the “Manila Policy Dialogue on Environment and

Transport in the Asian Region”, UNCRD, in collaboration with the Ministry of Environment of Japan, has sought to help create a new paradigm in transport practices for the region. With the assistance of world-leading sustainable transport experts and governmental partners, UNCRD developed the “Aichi Statement” in 2005. This statement outlined specific actions that cities can take across 12 major areas of Environmentally Sustainable Transport (EST). Additionally, the Aichi Statement marked the launch of the Regional EST Forum which brings together all major regional stakeholders in addressing the urgent problems facing Asia’s urban transport sector.

This Sourcebook has been prepared in advance of the “Asian Mayors Dialogue on Environmentally Sustainable Transport” being held in April 2007 in Kyoto. This event marks another milestone in setting a new standard of environmental excellence for sustainable transport practices in Asian cities. By sharing knowledge amongst Mayors in the region and by offering support to those cities wishing to pursue a more sustainable path, UNCRD hopes that catalytic new examples will emerge.

The Sourcebook has been produced at a critical juncture in the development of Asian cities. This year has already given us the news from the Intergovernmental Panel on Climate Change (IPCC) in which the dangers and spectre of global climate change are ever more worrying. The transport sector is already recognised as the fastest-growing source of greenhouse gas emissions, and Asia is at the front edge of this wave towards increasing motorisation and increasing emissions.

As populations continue to intensify in urban areas, the provision of sustainable transport becomes even more pressing in environmental, economic, and social terms. Once an automobile culture becomes entrenched in the rapidly-growing economies of Asia, there will be few opportunities to reverse the consequences. Thus, now is the time to act to move towards a more sustainable path before irreparable damage is done to the quality of our life today as well as that for future generations. We only require the will to do it.

Kazunobu Onogawa
Director, UNCRD

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UNCRD's own EST staff has applied much effort to ensuring this document and all the related EST events are co-ordinated and delivered in an effective and professional manner. Members of the UNCRD EST team include: Kazunobu Onogawa, Choudhury Rudra Charan Mohanty, Ken Shimizu, Tadahiro Shibata, Yoshiro Kaburagi, Sayako Kimura, and Sayaka Iizuka.

UNCRD is not alone in its efforts to promote Environmentally Sustainable Transport in Asian nations. The collaborating agencies in this effort include: Asian Development Bank (ADB), ASEAN Working Group on Environmentally Sustainable Cities (AWGESC), Clean Air Initiative for Asian Cities (CAI-Asia), Institute for Global Environmental Strategies (IGES), Overseas Environmental Cooperation Center (OECC), German Agency for Technical Cooperation (GTZ), Swedish International Development Agency (Sida), Seoul Development Institute (SDI), World Health Organization (WHO), and Japanese International Cooperation Agency (JICA).

UNCRD would also like to express gratitude to the Ministry of the Environment of the Government of Japan for providing the financial support to the critical issue of Environmentally Sustainable Transport in Asia. The ministry's expertise and investment has already made a positive difference in cities across the region.

Finally, UNCRD would like to express appreciation to the Mayors and other officials who have come together for the Mayors Dialogue in Kyoto. Without the political will and seriousness shown by this group of leaders, Environmentally Sustainable Transport would not be growing in awareness and reality in cities of Asia.

Acknowledgements

The Sourcebook for Environmentally Sustainable Transport has been made possible by the exceptional efforts of a wide group of governmental officials, partner organisations, international experts, and UNCRD staff. Only by drawing upon such a wide-range of experiences can a truly comprehensive set of best practices be compiled.

Much credit must be extended to the members of the Regional Forum on Environmentally Sustainable Transport (EST). This group, which was formed out of the development of the Aichi Statement, has contributed greatly to articulating the specific components of EST and in helping to disseminate that message.

The Regional EST Forum particularly depends on the sincere involvement and efforts of the participating countries. Thus, special appreciation is given to the participating countries of: Brunei Darussalam, Cambodia, P. R. China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Singapore, Thailand, and Viet Nam.

Additionally, the Regional EST Experts Forum has provided much of the technical knowledge that has supported the EST Project. The members of this forum include: Christopher Weaver (EF&EE),

Introduction to Environmentally Sustainable Transport

“Efforts to promote environmentally sustainable transport will result not only in the improvement of human health through the reduction of urban air pollution but will also have important complimentary benefits, including the reduction of greenhouse gas (GHG) emissions, the reduction of deaths and injuries from road accidents, the reduction of harmful noise levels, and the reduction of traffic congestion levels.”

Aichi Statement, 2005

Asian cities are at a crossroads. Along the current path, growing numbers of cars and motorcycles will overwhelm streets and neighbourhoods. Pollution, congestion, and accidents will become Asia's defining features. The cities will be less a place for human interaction than for storing and operating metal machines.

Yet, there is another path. Environmentally Sustainable Transport (EST) offers an alternative to uncontrolled motorisation and its related problems. Instead, a complementary package of public transport, quality footpaths and cycleways, vehicle-restriction measures, clean fuels, safety programmes, and high standards will create a new paradigm for urban mobility and access.

Many cities in the region, such as Seoul and Singapore, have already adapted many of these elements as part of a comprehensive policy towards a more human urban environment. This EST Sourcebook sets forth the elements of a complete EST strategy for Asian cities.



Figure 1. Asian cities today face a transport and environmental crisis. Photo courtesy of Swisscontact.

Urban transport and sustainable development

The ability to access jobs, education, and public services is a fundamental part of human development. An efficient and cost-effective transport system essentially connects people to daily life. For many Asian cities, though, effective transport has been forgone, leaving mobility needs exclusively in the hands of private vehicles and uncoordinated paratransit operators.

Transport services affect all aspects of sustainability. First, the ability to move goods and people is inextricably linked to economic development. A

city locked in congestion is a city losing a significant portion of its economic productivity. Second, the ability to safely and cost-effectively access jobs and public services carries direct implications for social sustainability. Providing quality public transport services and non-motorised options is an essential part of achieving greater social equity for all, and especially for transport-sensitive groups including the poor, women, children, the elderly, and the physically disabled. Finally, mobility and the quality of the urban environment cannot be separated. Existing transport systems and the resulting impacts on air quality are closely associated with questions of environmental sustainability.

Figure 2. The many impacts of unsustainable transport



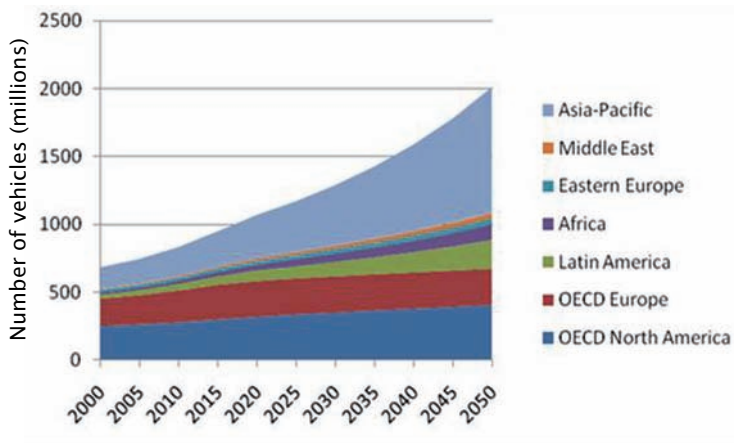
Source: Wright, 2005

Current conditions

Current trends in Asia show that cars and motorcycles are increasingly becoming dominant in nearly every city of the region. By the year 2045, there will be more motorised vehicles in Asia than there will be in Europe and North America combined. It is questionable whether Asian cities and the global environment could support such an outcome.

Few cities can afford to build themselves out of traffic congestion. Asphaltting over Asian cities will in the end only destroy the urban fabric without really changing congestion levels. The endless construction of flyovers and elevated roadways in many Asian cities has absorbed large sums of capital but has not kept pace with the growing demand for cars and motorcycles.

Figure 3. Motorised vehicle growth



Source: International Energy Agency, 2004

The impact of this trend on quality of life cannot be underestimated. As cities become saturated with vehicle traffic, then community interactions and social bonds will become permanently severed.



Figure 5. The myriad of flyovers and elevated roadways that dominate the landscapes of Bangkok, Delhi, Jakarta, and Shanghai has done little to relieve traffic pressures. Photo by Karl Fjellstrom.

Figure 4. The race to motorisation is fully moving ahead in Asia. Photo by Karl Fjellstrom.



While investment in motorways has expanded, all too often more critical elements of transport infrastructure have been forgotten. Footpaths, cycleways, and public transport services in much of the region are in poor condition. Merely attempting to walk in many Asian cities can be quite challenging.



Figures 6 and 7. As these images from Dhaka (left photo) and Kuala Lumpur (right photo) indicate, simply walking in Asian cities can be a risk to health, safety, and comfort. Left photo by Karl Fjellstrom. Right photo by Lloyd Wright.

Environmentally Sustainable Transport (EST)

As this document will assert, there is another way. The principles of Environmentally Sustainable Transport (EST) offer a cost-effective way forward that affords high levels of mobility and access but without the intrinsic problems associated with car-dominated streets.

EST represents a collection of best practice measures that can help to transform transport and the very urban structure of cities towards a more sustainable model. Through the development of “environment and people friendly urban transport infrastructures”, cities can reap the benefits of a more liveable and more productive urban space.

EST is also about prevention. It will clearly be less costly to prevent negative consequences of motorisation rather than to try to retroactively mitigate the problems. The leadership shown in cities such as Bogotá, Curitiba, and Seoul indicate that Environmentally Sustainable Transport is possible in a variety of circumstances and local conditions.

The remainder of this Sourcebook will outline a synergistic package of EST measures that any city can implement within a period of a few years. The structure of this Sourcebook is based on the 12 thematic areas of the UNCRD EST Project.



Figure 8. A car-free community in Oyumino (Chiba City, Japan) shows that environment and people friendly infrastructure can greatly enhance quality of life. Photo by Lloyd Wright.

1. Public health

“Because we don’t think about future generations, they will never forget us.”

Henrik Tikkanen, author and artist, 1924 - 1984

World air quality rankings show that Asian cities are by far the most polluted across a full range of contaminants, including particulate matter, nitrogen oxides, and carbon monoxide. A recent WHO/ADB study shows that the transport sector is the largest contributor of urban air pollution, with 50 to 80 percent of Metro Manila’s pollution being from vehicles.

Figures 9. Respiratory and cardiovascular illnesses are the most common health issues related to vehicle emissions. Photo courtesy of Swisscontact.



Air pollutants from transport are linked to several illnesses, most notably respiratory and cardiovascular illnesses. Epidemiological studies have directly linked transport-related contaminants to asthma, bronchitis, heart attacks, and strokes. A survey of studies shows that the number of deaths from outdoor air pollution ranges from 200 000 to 570 000 annual deaths globally (WRI, 1998).

In addition to premature mortality, there are also other economic costs resulting from pollutant-induced illness. Hospital admissions, lost work days, discomfort, and stress are just a few of these impacts. Air pollution also harms tourism and degrades the built environment.

The most vulnerable groups are those with weaker immune systems, which include “infants, the elderly, and those suffering from chronic respiratory conditions including asthma, bronchitis, or emphysema” (WHO, 2000). In developing-nation

cities air pollution causes an estimated 50 million cases of chronic coughing in children under the age of 14 years (WRI, 1998). Sadly, leaded fuels, which impair the mental development of children, are still in use in some nations.



Figure 10. Vehicle emissions can have a serious impact on child development. Photo courtesy of Swisscontact.

Obesity has become another outgrowth of societies dependent less on walking and more on private vehicles. In a survey of Beijing residents, the Beijing Centre for Disease Control and Prevention uncovered the following troubling results:

- 32 percent of Beijing residents suffer from coronary heart disease, hypertension, or obesity
- 47 percent of the population rarely or never undertook exercise
- 18 percent of all secondary students qualify as obese.

The best mechanism to combat such health effects is to reduce private vehicle use. Through the application of Environmentally Sustainable Transport (EST) measures, such as public transport, clean fuels, and non-motorised options, emissions can be eliminated before they cause harm.



Figure 11. Accidents have produced near epidemic proportions of death and injury on Asian roadways. Photo courtesy of iStockphoto.

2. Road safety and maintenance

“Not everything that counts can be counted, and not everything that can be counted counts.”

Albert Einstein, physicist, 1879 - 1955

Globally, approximately 1.2 million lives are lost through roadway accidents each year (WHO, 2003). More deaths occur due to road accidents than through many other high-profile causes, including malaria, measles, and breast cancer. More disturbingly, almost half of these deaths are not to the motorists themselves but rather pedestrians and cyclists.

In Asia, injuries and deaths from road accidents have reached near epidemic proportions. Nations in Asia have traffic fatality rates some 80 times higher than European nations. In ASEAN countries alone, an estimated 75,000 persons die each year on the roads and another 4.7 million are injured. All together, the ADB estimates that the economic losses from such tragedies are US\$ 15.1 billion per year, or approximately 2.2 of the regional Gross Domestic Product.

Country	Police reported		Estimated*	
	Deaths	Injuries	Deaths	Injuries
Brunei Darassalam	28	645	28	1,273
Cambodia	824	6,329	1,017	20,340
Indonesia	8,761	13,941	30,464	2,550,000
Lao PDR	415	6,231	581	18,690
Malaysia	6,282	46,420	6,282	46,420
Myanmar	1,308	9,299	1,308	45,780
Philippines	995	6,790	9,000	49,390
Singapore	211	7,975	211	9,072
Thailand	13,116	69,313	13,116	1,529,034
Vietnam	11,319	20,400	13,186	30,999
Total ASEAN	43,259	187,343	75,193	4,745,578

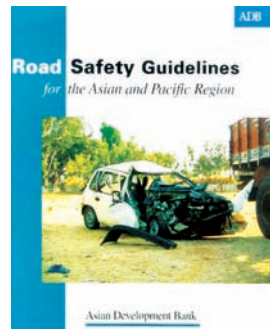
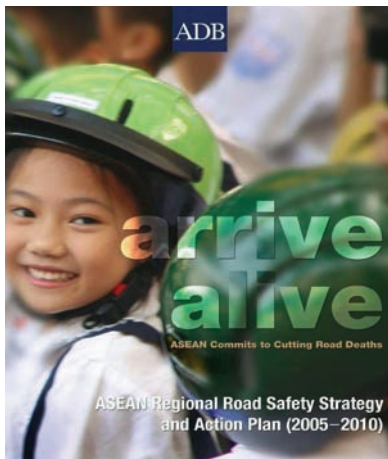
* Based on local research, health statistics, sample surveys, or international experience.

Source: ADB, 2003

To combat this alarming problem, ADB has launched several initiatives as well as provided technical manuals on road safety. Proper maintenance programmes for both roadways and vehicles are also a principal means to reduce the death and injury rates. Sweden's "Zero Tolerance" programme in which the nation has set its aims upon zero road traffic deaths has become a world-wide model, one which many Asian nations and cities may wish to investigate.



Figure 14. The cacophony of noise generated from chaotic transport systems harms human health and undermines city-wide productivity. Photo by Karl Fjellstrom.



Figures 12 and 13. The ADB has developed a range of safety programmes and guidances.

- Pain and hearing fatigue
- Hearing impairment including tinnitus
- Annoyance
- Precipitation of anti-social behaviour (aggressiveness, protest and helplessness)
- Interference with speech communication
- Sleep disturbance and all its consequences on a long and short term basis
- Cardiovascular effects
- Stress and its possible consequences on human metabolism (nutrition) and the immune system
- Negative impacts on work and school performance.

3. Traffic noise management

“The system of nature, of which man is a part, tends to be self-balancing, self-adjusting, self-cleansing. Not so with technology.” (Small is Beautiful)

E.F. Schumacher, economist, 1911 - 1977

Noise is also a growing concern from both the perspectives of health and economic productivity. Noise from vehicle operation, horns, and car alarms can all bring negative health consequences. The World Health Organization (WHO) has documented the most common problems associated with sustained and/or excessive noise levels (WHO, 2005):

Sustained exposure to noise has been associated with reduced cognitive development and classroom performance of children (Evans and Maxwell, 1997). Even seemingly harmless background noise has been indicted for its impact on the ability to concentrate. In turn, these lapses in concentration carry with them implications for worker productivity and child development.

The best measure against noise pollution is to simply prevent it from happening in the first place. Promoting silent, non-motorised options (such as walking and cycling) is the most effective policy direction. Likewise, shifts from private to public modes can lead to substantial noise reductions. In some cases, mitigation measures such as sound barriers and porous road surfacing may be necessary, although such infrastructure can often be far more expensive than noise prevention.

Figure 15. Mitigation measures such as noise barriers can be an expensive alternative to simply preventing noise through sustainable transport alternatives. Photo courtesy of UNCRD.



4. Social equity and gender perspectives

“Any town that doesn’t have sidewalks doesn’t love its children.”

Margaret Mead, anthropologist, 1901-1978

The transport inequities experienced in Asian cities are most acutely experienced by groups that are least able to cope with the difficulties. Gender and age inequities create mobility challenges for large parts of the population. Women face specific restrictions on movement due to the nature of their activities in many cities. Activities such as child-care, household management, and informal sector employment “require women to make more and shorter trips than men, more trips at off-peak hours and off the main routes, and engage in more complicated multi-leg trips, all of which tend to make their movements relatively expensive to provide for by public transport, and hence highly priced or poorly supplied” (World Bank, 2001). When 700,000 squatters resettled on

the periphery of Delhi, female employment fell by 27 percent due to the limited transport options available.

The provision of public transport with regular services throughout the day and with good physical and fare integration can do much to help women travellers. Likewise, provisions for patrons carrying children as well as amenities such as baby changing areas should be considered in all design efforts.



Figure 17. Child- and bicycle-friendly infrastructure can do much to ease transport burdens on women. Photo by Lloyd Wright.

Figure 16. As shown with the steep access to this pedestrian bridge in Bangkok, infrastructure sometimes fails to account for more vulnerable users. Photo by Lloyd Wright.

Women may also be more susceptible to insecurity related to travelling alone or by way of public transport, which may force women to depend upon more expensive alternatives or to forgo important trips. Thus, the presence of security staff, security cameras, and good-quality lighting can do much to give women more confidence with public transport and public space.



Figures 18 and 19. The presence of security personnel and good lighting can do much to give women confidence in public transport and public space. Left photo by Lloyd Wright. Right photo courtesy of TransMilenio SA.

5. Public transport planning and transportation demand management (TDM)

“The technologies which have had the most profound effects on human life are usually simple.”

Freeman Dyson, physicist, 1923 -

For much of Asia, public transport is a necessary evil that must be endured rather than appreciated. For many individuals and families, the ultimate goal is to one day afford individual motorised transport, either in the form of a motorcycle or automobile. The state of public transport implies discomfort, long waits, risk to personal safety, and restrictions on movement. Customer satisfaction with the myriad of informal and formal vans, mini-buses, and full-sized buses that ply Asian streets is typically quite low.

However, high-quality public transport is possibly more affordable than many cities are aware. The advent of Bus Rapid Transit (BRT) has done much to enable virtually any city to achieve a world-class public transport system. BRT is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective urban mobility through the provision of segregated right-of-way infrastructure, rapid and frequent operations, and excellence in marketing and customer service. BRT essentially emulates the performance and amenity characteristics of a modern rail-based transit system but at a fraction of the cost. A BRT system will typically cost 4 to 20 times less than a light rail transit (LRT) system and 10 to 100 times less than a metro system (Wright and Hook, 2007).



Figure 20. The TransMilenio BRT in Bogotá. Photo courtesy of Volvo Bus Corporation.

The Latin American cities of Bogotá and Curitiba have done much to demonstrate the effectiveness of BRT systems. However, several Asian cities have now also developed systems of their own, including Beijing, Hangzhou, Jakarta, Nagoya, Pune, Seoul, and Taipei. New projects are currently underway in several cities, including Ahmedabad, Bangalore, Bangkok, Chiang Mai, Delhi, Guangzhou, Hanoi, and Xi'an.

Figure 21. The Seoul BRT system. Photo courtesy of the City of Seoul.



Figure 22. The Jakarta BRT system. Photo courtesy of ITDP.



To make a truly car-competitive public transport system, cities must focus on some key customer-service oriented attributes, including:

- Existence of an integrated “network” of routes and corridors
- Enhanced stations that are convenient, comfortable, secure, and weather-protected
- Stations provide level access between the platform and vehicle floor
- Special stations and terminals to facilitate easy physical integration between trunk routes, feeder services, and other mass transit systems
- Pre-board fare collection and fare verification
- Distinctive marketing identity for system.



Figures 23 and 24. Smart card technology and a public transport control centre are some of the features that improve overall efficiency in high-quality public transport systems. Left photo courtesy of Volvo Bus Corporation. Right photo by Lloyd Wright.

Rail-based services can also be quite appropriate in the right circumstances, especially on corridors with very high customer demand and when cities have sufficient resources to finance a higher-cost option. Technologies such as LRT, commuter rail, elevated rail, monorails, and underground metros can all have applicability under the right conditions. In Asia, cities such as Hong Kong, Osaka, Singapore, and Tokyo have achieved much success with rail-based systems.

Bangalore Metropolitan Transport Corporation (BMTC) has adopted a well structured, constructive management policies and maintained the tradition of extending safe, affordable and commuter-friendly services. By focusing on safety, reliability and efficiency, the Corporation has been able to improve public transport systems and at the same time able to achieve a record surplus of 1148.80 million rupees in 2005-06 and is anticipating a surplus over 2000 million rupees during 2006-07. (Source: BMTC, India through personal communication, 6 April 2007)



Figure 25. The Hong Kong MTR system. Photo courtesy of the MTR Corporation.

A high-quality public transport system, though, is just one side of the equation. Combining public transport with transportation demand management (TDM) measures that discourage car and motorcycle use is the most effective package to transform the transport sector.

Congestion charging was originally popularised with its application in Singapore and now has gained fame elsewhere, including in the cities of London and Stockholm. Congestion charging places a monetary value on using the road space during certain hours of the day. Motorists who wish to enter a congestion zone must pay a fee to gain legal access to the use of the road.



Figure 26. The Electronic Road Pricing gantry in Singapore. Photo by Manfred Breithaupt.

From 1975 until 1998, Singapore operated a manually-controlled road pricing scheme. The scheme requires motorists to pay for entry into a central Restricted Zone. Technological advances enabled the city to implement an Electronic Road Pricing (ERP) scheme in 1998.

Singapore has also successfully curbed vehicle ownership and usage through a clever application of fees and a Certificate of Entitlement (COE) programme. The city essentially fixes the market for the number of vehicles that can use city streets.

Parking fees, restrictions, and enforcement can also be highly effective TDM measures. Simply charging the appropriate fee for use of a private or public parking space can help to ensure vehicles pay for the resources consumed. Parking space levies as applied in Australia both discourage

private car use and raise revenues for public transport development. Sydney charges a levy of A\$ 800 (US\$ 615) per year on each central area parking space, whether the space is used or not. The parking levy is currently returning approximately A\$ 40 million (US\$ 31 million) per year to the city.

Bogotá utilises a fairly simple license tag restriction in which 40 percent of the private cars are prohibited from the city streets each day during the morning and afternoon peak.



Figure 27. Each week day in Bogotá, 40 percent of the private cars are banned from operating during peak hours based on the vehicle's tag number.

6. Non-motorised transport

“At first it may appear that pedestrian space is a frivolous issue in a developing country; but the privations of low income people are not really felt during working hours - it is during leisure hours that the differences are felt. While higher income people have cars, clubs, country houses, theatres, restaurants and vacations, for the poor, public space is the only alternative to television. Parks, plazas, pedestrian streets and sidewalks are essential for social justice. High quality sidewalks are the most basic element of respect for human dignity, and of consideration for society’s vulnerable members such as the poor, the elderly and children.”

Enrique Peñalosa, former Mayor of Bogotá

The simplest and most environmentally-sustainable transport options are unfortunately also some of the most neglected. Footpaths in Asian cities are often of poor quality, and create an assortment of barriers for residents:

- Unpaved and/or uneven footpaths
- No physical separation from high levels of traffic and from high-speed traffic
- Lack of infrastructure to permit crossing of street
- Obstructed pavements due to car parking, vendors, etc.
- No protection from harsh climatic conditions (e.g. no shading or rain protection)
- Lack of street lighting
- Pedestrian overcrowding due to narrow or below-capacity pavements
- High levels of robbery, assault and other crime befalling pedestrians

Simply improving the quality of local footpath networks can be one of the most cost-effective EST measures. In some cases, it may be possible to entirely pedestrianise streets to create a very social and human-friendly environment. Pedestrianisation schemes have also been the basis for economic regeneration efforts, as shops sales often improve dramatically. Waterfront regeneration efforts, such as Singapore’s Boat Quay and Osaka’s Dotomburi have been successfully instigated through pedestrianisation. Nanjing Road in Shanghai is the world’s busiest pedestrian mall.

Figure 28. Nanjing Road in Shanghai is the world’s most successful pedestrian mall, proving such schemes do indeed add much economic and social value to the city. Photo courtesy of ITDP.

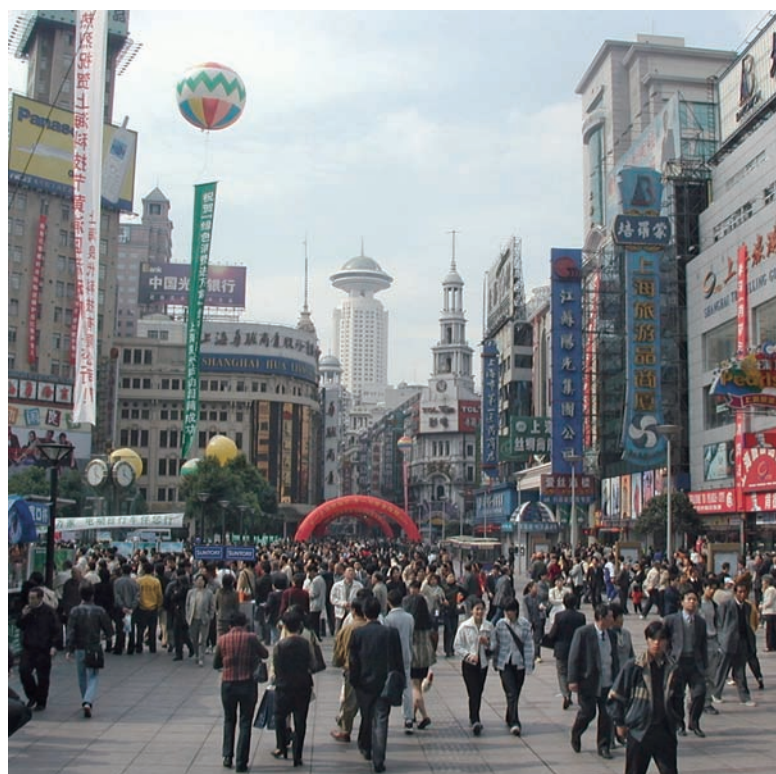


Figure 29. Each Sunday, Bogotá gives 120 kilometres of road space over to cyclists, skaters, joggers, and families. Photo by Lloyd Wright.

Car-free days have become increasingly popular as a mechanism to curb car and motorcycle use as well as encourage citizens to experience their city in a personal manner. Each year, World Car Free Day is held on 22 September. In 2007, China has committed to participating on a nation-wide scale. In some cities, such as Bogotá and Tokyo, sections of the cities are closed to cars each Sunday in order to allow families to stroll at ease in the city.



Figure 30. Tokyo's Ginza district becomes a pedestrian paradise each weekend. Photo by Lloyd Wright.



Bicycles have historically played a vital role in Asian transport. Ironically, even as environmental concerns become ever more important in the region, many cities have actively discouraged bicycle use. The restoration and expansion of cycleways and the promotion of a bicycle lifestyle should be a priority within any EST strategy. The provision of secure bicycle parking at public transport stations can be an effective cornerstone of making cycling a formal part of the transport system.

Figure 31. Bicycle parking in front of a rail station near Tokyo. Photo by Lloyd Wright.



Bicycle taxis or pedicabs have likewise been unfortunately banned in many parts of Asia (e.g. Bangkok, Delhi, and Jakarta). However, a revolution in pedicab design has helped to rejuvenate the viability and market for these services. As pedicabs and cycle rickshaws are being banned in parts of Asia, their usage in Europe and North America is expanding at a rapid rate.

Through a collaboration between ITDP and several local partners, a modernised cycle rickshaw has been developed for the Indian market. The project produced a modern, light weight vehicle at a modest cost. Today, over 100,000 modernised pedicabs are plying the streets of Indian cities. Likewise, Manila has long had a history of pedicabs as a useful community transport service.



Figures 32 and 33. Modernised pedicabs have helped lead a renaissance in the use of this sustainable mode. Photos by Lloyd Wright.





7. Environment and people friendly urban transport infrastructures

“The Cheonggyecheon stream, which had been covered with roads and concrete overpasses for a long time, glistened in the bright sunlight as the clear, clean water flowed. The sight of the stream flowing again after so long has special significance beyond merely environmental and cultural restoration. It seemed to open the hearts of Seoul citizens, washing away the darkness and sufferings of the hectic economic development period of the modern history of Seoul.”

Lee Myung-Bak, former Mayor of Seoul

Unlike car-based infrastructure such as roadways and flyovers, EST infrastructure is based more on the human scale. And thus, such infrastructure is

orders of magnitude less costly. “Environment and people friendly urban transport infrastructures” imply the customer is placed at the centre of the design process.

Perhaps the most renowned infrastructure project of the past decade in Asia was the Cheonggyecheon restoration project in Seoul. The Cheonggyecheon stream was historically a defining part of Seoul’s environment, and in fact was the reason why Seoul was selected as the capital of the Joseon Dynasty in 1394. Unfortunately, in the face of modernisation, the waterway was covered in 1961 to provide better access for private cars. By 1968 an elevated expressway provided another layer of concrete erasing the memory of the waterway.

Upon his election in 2002, Seoul Mayor Lee Myung-Bak decided it was time to bring back the Cheonggyecheon stream from its years of hiding under concrete. The Cheonggyecheon project has meant the restoration of 5.8 kilometres of waterway and historical pedestrian bridges, the creation of extensive green space, and the promotion public art installations. Based upon a study by the Seoul Development Institute (2003), the Cheonggyecheon restoration project will produce economic benefits of between 8 trillion and 23 trillion won (US\$ 8 billion to US\$ 23 billion)

and create many new jobs. Over 40 million visitors experienced the Cheonggyecheon stream during its first year after restoration.

People-friendly infrastructure also refers to designing for society's most disadvantaged. By building public transport systems and footpaths that cater to the physically disabled and the elderly, the infrastructure is friendly to everyone. Design should be undertaken from the perspective of the most vulnerable users.



Figure 36. Over 40 million visitors have made their way to see the Cheonggyecheon restoration. Photo courtesy of the City of Seoul.



Figure 37. Level, even surfaces across the transport system can do much to make the city accessible to everyone. Photo courtesy of Queensland Transport.

8. Cleaner fuel

“We must learn to provide affluence without effluence...by consuming less from the environment, not more. We can use less, and have more. Consume less, and be more. The interests of business, and the interests of environment, are not incompatible.”

Tachi Kiuchi, former CEO of Mitsubishi

Technology alone will not win back Asian cities. A sole focus on tailpipe technologies and fuels means little against the growing tide of motorisation. However, cleaner fuels and propulsion technologies are one component of a complete sustainable transport package. Some of the fuel options available may include:

- Clean diesel
- Compressed natural gas (CNG)
- Liquid petroleum gas (LPG)
- Electric
- Bio-diesel
- Ethanol
- Hybrid-electric (diesel-electric and CNG-electric)
- Hydrogen (fuel cell technology)

The choice of fuel and propulsion technology will have a profound impact on operating costs, maintenance costs, supporting infrastructure, as well as emission levels. Local circumstances play a central role in fuel choice as the availability of a fuel and experience in maintaining a particular vehicle technology are key factors. There is no one right solution to fuel technology.



Figure 38. A new low-floor CNG vehicle being developed for the Indian market. Photo courtesy of Tata Motors.

The adoption of compressed natural gas (CNG) public transport vehicles in Delhi has done much to improve air quality. CNG was chosen in order to overcome the problem of diesel fuel being adulterated with kerosene.

In the future, advanced technologies such as hybrid-electric vehicles, biofuels (ethanol and bio-diesel), and fuel cells may play a bigger role, especially as economies of scale are achieved and costs are reduced. Cities can help make the transition to cleaner fuels a reality by converting city vehicle fleets to alternative fuels. Local government leadership can help to establish new markets for these fuels as well as provide the pre-requisite re-fuelling infrastructure.



Figure 39. A hybrid-electric vehicle being tested in Latin America. Photo courtesy of Volvo Bus Corporation.

9. Strengthening road side air quality monitoring and assessment

“Plan for what is difficult while it is easy, do what is great while it is small. The difficult things in this world must be done while they are easy, the greatest things in the world must be done while they are still small.” (The Art of War)

Sun Tzu, Chinese General, 400 BC

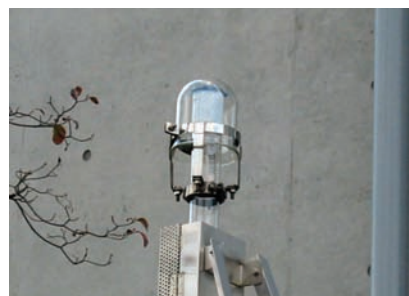
Asia’s fast-growing economies have left behind a trail of smog and toxic-laden air in many of its largest cities. Vehicle emissions are one of the principal contributors to poor air quality. Establishing an air quality monitoring regime can help decision makers understand the severity of the problem.



Figure 40. Air quality in Shanghai on a normal day. Photo by Manfred Breithaupt.

Ideally, an air quality monitoring system will already be in place. However, in many Asian cities, there may be an insufficient number of air quality monitoring stations or such stations may not exist at all. Discussions with both the national environmental agency as well as international organisations, such as the Clean Air Initiative, the World Bank, and the Asian Development Bank, should be undertaken to find a way of establishing an air quality monitoring network.

Figure 41. Air intake opening for monitoring of ambient air quality. Photo courtesy of UNCRD.



Air quality monitoring actually can encompass several different levels of measurement. Ambient monitors will capture the general background air quality levels of the city. These ambient measurements provide the basis for comparing to the established norms of the World Health Organisation (WHO). However, there can also be reason to measure air quality levels at a much more localised level.

In many cases, the person walking along the street may experience contaminant levels well in excess of those experienced at the ambient level. Further, some vulnerable groups may be more exposed to contaminants than others. For example, the height of children means that they are actually more in the direct line of exhaust tailpipes. Low-income persons often work from informal stalls quite near the roadway, and may spend as much as 10 to 14 hours per day in an environment of intense emissions. Likewise, traffic police may spend long hours in direct contact with traffic and contaminants. For these special groups, spot monitoring of localised effects should be undertaken on a regular basis.

Figure 42. Spot monitoring of localised contaminant levels can be especially important for some key groups, such as informal vendors and traffic police, as evidenced with this image from Bangkok. Photo by Carlos Pardo.



10. Vehicle emission control, standards, and inspection and maintenance (I/M)

“For a successful technology, reality must take precedence over public relations, for nature cannot be fooled.”

Richard P. Feynman, physicist, 1918 - 1988

Vehicle emissions testing should be a formal part of the regulatory code, both for new and older vehicles. Semi-annual or annual testing should be a base requirement to obtain an operating license for any vehicle. Many Asian nations have already adapted Euro II standards, and in cases such as Hong Kong and Thailand, Euro III standards are being applied. Setting strict standards for all new vehicles is one of the most effective mechanisms to renovate the overall fleet. At the same time, testing requirements should also apply to the existing, older vehicle.



Figure 43. Random, on-street spot monitoring of vehicles can be an effective way of ensuring regulatory norms are met in practice. Photo courtesy of UNCRD.

In addition, spot monitoring on the roadway can also be appropriate. In some cases, drivers may specially fix their vehicles to pass a known, one-off annual test. However, once the test is finished, the owner may remove filters and other emission reduction devices. Random street tests thus serve the purpose of ensuring the actual vehicle performance meets the regulatory standards.

11. Land-use planning

“A good city is like a good party, people don’t want to leave early.”

Jan Gehl, Copenhagen planner and architect

“Land use” refers to the geographic distribution of activities and destinations within a city. A close relationship exists between a city’s land-use patterns and its transport system. Land use is sometimes defined by the 3 “Ds”: 1. Density; 2. Diversity; and, 3. Design.

Urban density refers to the number of inhabitants per hectare. The denser the city, the closer jobs and services are to the population. Areas with medium- and high-density populations provide a critical mass of inhabitants to support shops and public services without requiring access by motorised vehicles. By contrast, a highly sprawled city will force car dependency since it is difficult to operate public transport in low density areas. While Asian cities have historically enjoyed effective density levels, the current trend is towards new development in suburban areas.

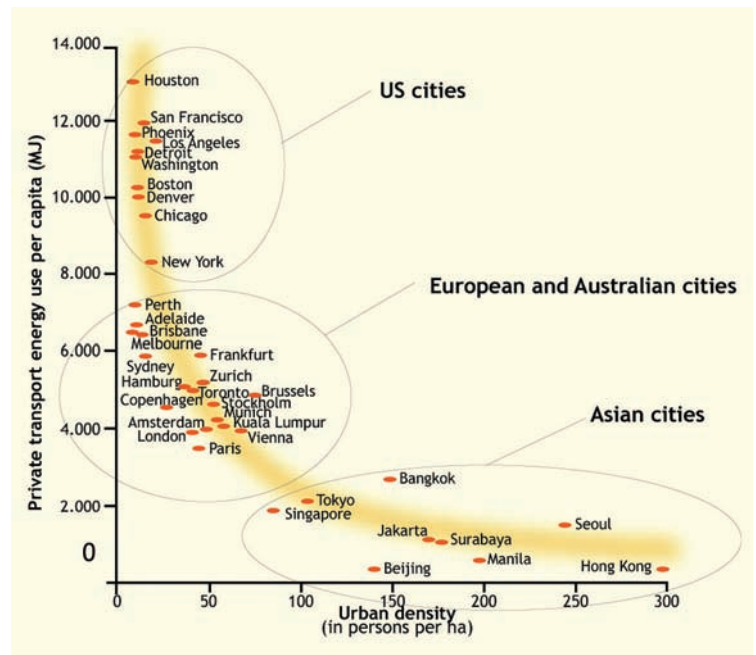


Figure 44. Asian cities have historically achieved good density levels, but there are now signs of sprawl development in many parts of the region. Graphic courtesy of Newman and Kenworthy (1989).



Figure 45. Many Japanese cities have successfully combined small commercial areas with residential areas to facilitate both sustainable transport and a vibrant local economy. Photo by Lloyd Wright.

Diversity refers to creating a mix of uses within a local area. By combining residential and commercial uses into a single area, the number of trips and the length of travel are both reduced. People are able to meet most of their daily needs by walking, cycling, or public transport.

Design refers to the planning of housing, shops, and public transport in a manner that supports a reduced dependence on private motorised vehicles. Transit-oriented development (TOD) has emerged as one of the principal mechanisms to make this happen. By increasing the portion of destinations (homes, worksites, shops, schools, public services, etc.) located near public transport stations, both the residents and the public transport system gain advantages.

Figure 46. The Hong Kong MTR system features shops within the system, bringing much convenience to the public transport user. Photo of the Hong Kong MTR Corporation.

Despite the close relationship between land use and transport, the two areas are frequently planned separately, meaning an opportunity is lost to optimise both. Singapore's Land Transport Authority represents a single agency combining both responsibilities. The success of Singapore's transport system is clearly in part due to its effective institutional structures.



12. Strengthening knowledge base, awareness and public participation

“ The newly motorising countries can see what a mess the North has made and how inefficient are its very large investments in a transport system that fails to deliver health, social equity and regional equity. It is possible for a newly motorising country to leapfrog the last 40 years of European and the last 70 years of North American transport development and move directly into a sustainable strategy that genuinely conserves resources, reduces pollution and pays great attention to the poorest when disbursing scarce cash.”

John Whitelegg, educator and transport planner

Figure 47. Participants at a Manila BRT workshop, sponsored jointly by UNCRD, CAI-Asia, and GTZ SUTP.



City leaders wishing to make a commitment to Environmentally Sustainable Transport (EST) will not be alone in this effort. A full range of regional and international organisations exist to help Asian cities make this transformation.

As has been noted, the Asian Development Bank (ADB) provides information and guidance on a range of topics, including safety and vehicle maintenance. Likewise, lenders such as the ADB and the World Bank stand ready to extend financial resources for high-quality projects.

The Clean Air Initiative for Asian Cities (CAI-Asia) is a multi-sector network seeking to improve air quality in Asia. CAI-Asia hosts a variety of capacity-building events, including the bi-annual Better Air Quality (BAQ) conference. Additionally, CAI-Asia has been active in developing transport and air quality indicators for Asian cities, so that decision makers have the appropriate tools and information to make positive investments. More information on these topics can be found on the CAI-Asia website, www.cleanairnet.org/caiasia.

The Sustainable Urban Transport Project (SUTP) of the German Agency for Technical Co-operation (GTZ) has developed a full array of Sourcebooks on EST topics. Additionally, SUTP offers training workshops to cities on topics such as Bus Rapid Transit, car-free days, and sustainable transport marketing and awareness. To download the GTZ SUTP Sourcebook or to contact GTZ regarding interest in holding a training workshop, the web site is www.sutp.org.



Figure 48. The GTZ SUTP Sourcebook has numerous modules on a variety of sustainable transport topics.

With an objective to achieve greater harmony between environment and transport, the Ministry of the Environment-Japan, has been promoting various initiatives to facilitate the exchange of information, best practices, tools, and technologies among Asian countries on EST. In line with the outcome of the First Meeting of the Regional EST Forum, 1-2 August 2005, Nagoya (Japan) and recommendations made in the Aichi Statement, MoE-Japan is committed to further promote efforts to attain the environmentally sustainable transport in Asian countries. More information on MOE's initiatives can be found at www.env.go.jp/en/air/.

Other key organisations working in the region include the Institute for Transportation & Development Policy (www.itdp.org) and the Embarq programme of the World Resources Institute (<http://embarq.wri.org>).

Finally, UNCRD's EST project stands ready to assist cities seeking to move towards a more sustainable form. The EST project provides information, hosts workshops, and supports policy formation in cities across Asia. More information on the EST project can be found at www.uncrd.or.jp/env/est. The Aichi Statement can be downloaded from this website.

Partnering with cities and officials who have been through the EST experience can ensure that the lessons learned from existing projects are shared with all.



Figure 49. The EST website, www.uncrd.or.jp/env/est, provides up-to-date information on news, training opportunities, and upcoming events.

Making it happen through political will

“Any city, whether small or large, can be an agent of change.”

Jaime Lerner, former Mayor of Curitiba

As stressed throughout this EST Sourcebook, most aspects of Environmentally Sustainable Transport do not require significant financial investments. Most aspects of EST are not technologically difficult to achieve. The principal barrier to implementing EST is the political will to do so. Overcoming entrenched practices and an acceptance of the status quo is the greatest challenge to creating an EST city, a city where people are put first.

For the officials who have made the decision to transform their cities, the rewards can be great. A healthier city, in which the residents can easily access jobs, services, and leisure without costly and polluting transport, awaits those who choose to accept this challenge. Environmentally Sustainable Transport is a cost-effective solution for today and for the future.

“We must be the change we wish to see.”

Mahatma Gandhi, 1869 - 1948



Figures 50 and 51. Strong political leadership towards EST, as shown by former Seoul Mayor and current President of the Republic of Korea, Lee Myung-Bak and former Jakarta Governor Sutiyoso, can make all the difference. Left photo by Eric Möller. Right photo by Michael Replogle.

About the Asian EST Initiative

The EST Initiative, which is a joint initiative of UNCRD and the Ministry of the Environment-Japan, aims to build a common understanding across Asia on the essential elements of EST and the need for an integrated approach at local and national level to deal with multi-sectoral environment and transport issues, including GHG emission reduction.

Under the EST Initiative, the 1st Regional EST Forum, held in 2005, resulted in the Aichi Statement which articulated a comprehensive list of sustainable transport objectives based on 12 major thematic areas (shown in the figure below). In 2007 and 2008, over 30 Asian cities signed the Kyoto Declaration for the Promotion of EST in cities, thereby endorsing the objectives underlined in the Aichi Statement.

In 2009, the EST Initiative produced the Seoul Statement Towards the Promotion of EST for a

Low-Carbon Society and Green Growth in Asia, which highlighted the need for regional efforts towards win-win solutions that capture co-benefit considerations in addressing sustainable transport and climate change (<http://www.uncrd.or.jp/env/est/>).

Some of the ongoing and future activities of the EST Initiative aim to:

- Promote a decentralized network of knowledge base on the various aspects of EST;
- Promote development of integrated EST strategies through highly participatory and consultative processes;
- Increase awareness and capacity of local and national governments and other key stakeholders on EST through training workshops; and
- Facilitate partnerships between the Asian countries and donor communities.



Figure 52. Twelve thematic areas of the integrated EST strategy.

AICHI STATEMENT

~ Towards establishment of the Regional Forum for the promotion of environmentally sustainable transport (EST) in Asia ~

The participants, having met in Nagoya City, Aichi Prefecture, Japan from 1-2 August 2005, for the International Conference on Environment and Transport, to draw up and adopt a statement on the establishment of a Regional EST Forum for the promotion of environmentally sustainable transport in Asia,

Reaffirming and building upon the 'Manila Statement' agreed upon by the participants at the intergovernmental Manila Policy Dialogue on Environment and Transport in the Asian Region, held in Manila, the Philippines, from 16-17 January 2004,

Reaffirming and building upon the 'Framework for Environmentally Sustainable Cities in ASEAN', agreed upon by the ASEAN Working Group on Environmentally Sustainable Cities (AWGESC) and officially endorsed by the ASEAN Environment Ministers in December 2003,

Reaffirming and building upon the Johannesburg Plan of Implementation (JPOI) adopted in the 2002 World Summit on Sustainable Development (WSSD) which underlines the importance of environmentally sustainable transport and the required actions to be taken at national and international level,

Noting the important contribution sustainable transport systems can make towards realizing the Millennium Development Goals (MDG) set by the United Nations, through improving access to education, employment opportunities, and health care,

Noting the importance of achieving greater synergies among the various efforts to promote environmentally sustainable transport in Asia, at the regional, national and local level,

Acknowledging that continued economic growth in Asian countries will result in significant further growth in transport demand, which will require a wide range of effective measures at the national and local level to prevent or minimize negative environmental and social impacts associated with the rapid growth in motorization,

Considering that efforts to promote environmentally sustainable transport will result not only in the improvement of human health through the reduction of urban air pollution but will also have important complimentary benefits, including the reduction of greenhouse gas (GHG) emissions, the reduction of deaths and injuries from road accidents, the reduction of harmful noise levels, and the reduction of traffic congestion levels,

Recognizing the need for both national and local level governments to develop and adopt integrated policies, strategies, and programmes incorporating key elements of environmentally sustainable transport such as:

a. Public health

- *Promoting integrated transport policies that mitigate the negative human health impacts of motorized transport*
- *Recognizing the high costs incurred to the national health system due to non-sustainable transport modes*
- *Strengthening the coordination and cooperation among health and transport agencies*

b. Land-use planning

- *Accepting a vision of cities for people rather than for cars, with a focus on the movement of people and goods rather than vehicles*
- *Supporting urban planning with a particular emphasis on public transport, non-motorized transport, traffic safety and environmental control*
- *Encouraging the integration of both land-use and transport planning to reduce the unplanned, low-density expansion of urban areas*
- *Promoting urban revitalization through mixed-use development, favouring concentrated development around public transport nodes*

c. Environment and people friendly urban transport infrastructures

- *Providing affordable and socially acceptable transport infrastructure and facilities in urban areas*
- *Recognizing that overprovision of infrastructure can induce additional travel by private motorized vehicles and result in increased pollution and congestion, unless appropriate consideration is made*
- *Acknowledging the importance of mass transit systems in meeting the needs for increased mobility in an environment friendly manner*

d. Public transport planning and transport demand management (TDM)

- *Maintaining or increasing the share of public transport by improving the quality of such services*
- *Controlling the demand for private motorized travel through a combination of policies, such as regulatory measures (manage demand for road space), fiscal policies (such as parking fees, vehicle taxes, road or congestion charging, and fuel taxes, etc.), and infrastructure design measures*
- *Recognizing Bus Rapid Transit (BRT) as a low-cost mass transit option which can be implemented quickly to meet the growing demand for mobility*
- *Recognizing Mass Rapid Transit (MRT) as a mass transit option which can be implemented to meet the growing demand for mobility, where appropriate*

e. Non-motorized transport (NMT)

- *Acknowledging the dependence of all-income groups on non-motorized transport and its importance as an environmentally sustainable mode of transport*
- *Aiming to maintain or enhance the existing role of non-motorized transport, especially in dense urban areas, especially for short trips*
- *Encouraging the provision of higher-quality infrastructure and the development of city-level master plans for footpaths and cycle ways*
- *Increasing safety for non-motorized transport*

f. Social equity and gender perspectives

- *Acknowledging the need for, and contribution of, safe and affordable urban transport systems to the alleviation of poverty and the promotion of social development*
- *Recognizing that public transport has to address the conditions of women and the need to build the institutional capacity to better include gender aspects in urban transport planning*
- *Providing infrastructure that particularly caters to the needs of the most vulnerable users, including children, the elderly, and the physically disabled*

g. Road safety and maintenance

- *Creating appropriate inter-agency coordination and management mechanism to address the road safety in transport policies and programmes*
- *Acknowledging road safety as a primary guiding principle for transport planning*
- *Mobilizing resources for formulation and implementation of multi-stakeholder integrated road safety action plans*

h. Strengthening road side air quality monitoring and assessment

- *Improving road side air quality monitoring in urban city centres to better understand the impacts of road side pollution on people travelling on the roads and people working or living close to the roads*
- *Improving and harmonizing road side monitoring methodologies in line with the internationally standardized methodologies for ambient air quality monitoring*

i. Traffic noise management

- *Improving traffic noise monitoring in urban city centres to better understand the impacts of road side noise on people travelling on the roads and people working or living close to the roads*
- *Acknowledging the need for standards on noise levels and the enforcement of such standards by establishing management mechanisms*
- *Promoting the prevention of excessive noise through the promotion of non-motorized modes and high-quality public transport*

j. Cleaner fuel

- *Phasing out leaded gasoline as rapidly as possible, and phasing down sulphur levels in gasoline and diesel as required to achieve advanced vehicle emission standards*
- *Acknowledging the contribution of alternative fuels such as Compressed Natural Gas (CNG) and bio-mass-derived ethanol and biodiesel as a means to reduce vehicle emissions*
- *Planning for an eventual transition to renewable fuels*

k. Vehicle emission control, standards, and inspection and maintenance (I/M)

- *Rapidly phasing-in strict emission standards for new vehicles, with due regard to manufacturing lead times and to the provision of compatible fuels*
- *Adopting and enforcing vehicle inspection and maintenance programmes for vehicle emissions and safety, based on high-volume, test-only inspection centres with stringent quality control*
- *Reducing emissions from in-use vehicles by retro-fitting of emission control devices and/or the conversion to lower-emitting fuels*

l. Strengthening knowledge base, awareness, and public participation

- *Promoting coordination and cooperation among groups collecting or managing information on EST through a decentralized network of knowledge providers*
- *Developing and disseminating best practice on EST*
- *Increasing the understanding and awareness of the civil society and decision-makers on the beneficial aspects of EST with the aim to accomplish changes in policies, investment decisions, and personal behaviour*

Noting the best practice principles presented in this document, the participants are thus called upon to:

1. unanimously endorse the Regional EST Forum and welcome the contribution by its expert members to conduct periodic high-level policy dialogues and expert consultations to share opinions, ideas, and information on best practices and effective policy instruments among the participating countries on environment and transport related issues in the Asian Region;
2. welcome the initiatives of UNCRD in extending assistance to the countries of the region, especially the developing countries, in preparing national EST strategies, and request the expert members of the Forum to play a catalytic role by providing substantial input and strategic feedback towards the formulation of such strategies;
3. welcome the involvement of all groups including international organizations, bilateral organizations, nongovernmental organizations and civil society, academic institutions, foundations, private enterprises, and others, in developing and promoting a decentralized cooperation network to contribute to activities

undertaken in support of the Forum such as knowledge management, capacity-building, and the formulation of integrated action plans;

4. request UNCRD to cooperate with other related organizations and initiatives both at the national and international levels in identifying and exploring sources of potential assistance and collaboration for capacity-building activities, including demonstration and pilot projects, as well as for the implementation of policies, strategies, and action plans developed by the participants of the Forum; such efforts may include providing assistance to the Forum participants in utilizing the Global Environment Facility (GEF), the Clean Development Mechanism (CDM), and financing from the bilateral and international organizations to implement EST measures.

-KYOTO DECLARATION-

for the Promotion of Environmentally Sustainable Transport in Cities

(24 April 2007)

We, the Mayors and governmental representatives of Asian cities, having met in Kyoto, Japan on 23-24 April 2007 at the Asian Mayors' Policy Dialogue for Promotion of Environmentally Sustainable Transport (EST) in Cities, to discuss and address key policy issues on environment and transport from city perspectives under the overall framework of the Regional EST Forum,

Recognizing that cities in the region are faced with a number of critical environment and transport related issues, their implications for human health, economic well-being, and social equity, and the emerging need to define and implement clear goals at the city level in line with the Millennium Development Goals (MDGs) and the Johannesburg Plan of Implementation (JPOI) adopted at the 2002 World Summit on Sustainable Development (WSSD),

Reaffirming and building upon the Aichi Statement agreed upon at the First Meeting of the Regional Environmentally Sustainable Transport Forum in Asia, held in Nagoya, Japan, from 1-2 August 2005,

Noting the objectives of the Regional EST Forum, an initiative of the United Nations Centre for Regional Development (UNCRD) in cooperation with Asian countries, which is comprised of high-level government representatives and experts in various thematic areas related to EST, and which provides a strategic and knowledge platform for sharing experiences and disseminating best practices, policy instruments, tools, and technologies,

Emphasizing that the Regional EST Forum has identified in the Aichi Statement the need for both national and local governments to develop and adopt integrated policies, strategies, and programmes incorporating key elements of environmentally sustainable transport,

Realizing the importance of strengthening regional cooperation for sustainable cities through the framework of the ASEAN Working Group on Environmentally Sustainable Cities (AWGESC) and other initiatives, such as the International Council for Local Environment Initiatives (ICLEI) and the Kitakyushu Initiative for a Clean Environment,

Acknowledging the important role that Mayors could play in implementing local-level actions to make cities healthy, green, and environment- and people-friendly in cooperation with key stakeholders, and also addressing local issues which have regional and global implications, such as climate change,

Recognizing the importance of achieving greater synergy between local actions and national strategies and programmes to realize EST,

We, the Mayors, thus hereby declare our intention to:

1. resolve to demonstrate leadership and ownership in promoting EST and setting the vision in Asian cities in motion in close collaboration with the national government, the private sector, civil society, and regional and international communities,
2. commit to implementing integrated policies, strategies, and programmes addressing key elements of EST such as public health; land-use planning; environment- and people-friendly urban transport infrastructure; public transport planning and transport demand management (TDM); non-motorized transport (NMT); social equity and gender perspectives; road safety and maintenance; strengthening

road side air quality monitoring and assessment; traffic noise management; reduction of pollutants and greenhouse gas emission; and strengthening the knowledge base, awareness, and public participation,

3. dedicate ourselves to specifically addressing priorities that are often under-emphasized but are nevertheless vital and central to EST, such as the provision of exclusive pedestrian and bicycle lanes, and ensuring safe and comfortable movement of women, children, the elderly, and the physically impaired,
4. dedicate ourselves to specifically address the adverse impact of the growing number of motorcycles in most Asian cities,
5. ensure sustainable financing and equitable pricing structures for implementing EST,
6. resolve to actively collaborate and cooperate through the Regional EST Forum in order to share information and promote the incorporation of EST elements in city master plans and programmes,
7. urge the international and donor community to acknowledge the importance of city-based actions and programmes concerning EST, and strongly appeal to them to actively support the implementation of these actions and programmes by providing financial assistance, and facilitating technology transfer and capacity-building through pilot and demonstration projects,
8. call for city-to-city cooperation to address issues of common concern and to bridge knowledge, policy, and technology gaps in the environment and transport sector, and
9. explore possible opportunities for organizing similar policy dialogues on a regular basis in collaboration with the international and donor community.

We are thus convinced that the concerted efforts of national governments, city authorities, the private sector, civil society, and the donor and international community will contribute to a more profound vision of EST for Asian cities in the 21st century.

We express our sincere appreciation to the organizers, experts, and participants for contributing their ideas, opinions, and experiences which will greatly help us in achieving this milestone.

(Extended 12 November 2008)

Subsequently twelve Asian cities (Baguio, Bangkok, Batam, Cebu, Colombo, Guwahati, Karachi, Kathmandu, Makassar, Makati, Palembang, and Surat) having met in the Special Event of Asian Mayors on Environmentally Sustainable Transport during Better Air Quality (BAQ) 2008 Workshop in Bangkok, Thailand on 12 November 2008, unanimously endorsed and signed the Kyoto Declaration for the promotion of environmentally sustainable transport (EST) in Asia.



Figure 53. In April 2007, representatives from 22 cities (Bangalore, Bhubaneswar, Jeju, Korat, Kuching, Kyoto, Luang Prabang, Matale, Nagoya, Phnom Penh, Quezon, Semarang, Seoul, Siem Reap, Singapore, Surabaya, Suzhou, Sylhet, Tianjin, Ulaanbaatar, Vientiane, and Yogyakarta) signed the Kyoto Declaration, which pledged support to EST principles. Photo courtesy of UNCRD.

Figure 54. In November 2008, further 12 cities (Baguio, Bangkok, Batam, Cebu, Colombo, Guwahati, Karachi, Kathmandu, Makassar, Makati, Palembang, and Surat) signed the Kyoto Declaration during the Better Air Quality Workshop in Bangkok. Photo courtesy of UNCRD.



SEOUL STATEMENT

~ Towards the Promotion of Environmentally Sustainable Transport (EST) for
a Low-Carbon Society and Green Growth in Asia ~

The participants, having met in Seoul, the Republic of Korea from 24 to 26 February 2009, for the Fourth Regional EST Forum, to draw up and adopt a statement for the promotion of environmentally sustainable transport in Asia,

Noting that Asia is experiencing the fastest economic growth and by mid of this century, and at the current growth rate there might be more motorized vehicles in Asia than there would be in Europe and North America combined, and that the profound impact of this trend on quality of human life and environment can not be underestimated,

Reaffirming and building upon the integrated EST measures defined under the *Aichi Statement* adopted at the First Regional EST Forum in Asia, held in Nagoya, Japan, on 1-2 August 2005, and considering that efforts to promote environmentally sustainable transport will not only result in the improvement of human health through the reduction of urban air pollution, but will also have important complementary (co-) benefits, including the reduction of greenhouse gas (GHG) emissions,

Recognizing the outcome of the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific held in Seoul in 2005, which endorsed environmentally sustainable economic growth, *Green Growth*, as a policy focus and important strategy for achieving the Millennium Development Goals (MDGs) as well as decoupling environmental degradation from development,

Noting the commitment made by the Ministries of Health in Member States in the resolution of the WHO Regional Committee for the Western Pacific in September 2008 to assess the health implications of the decisions made on climate change by the transport sector and advocate for the decision that provide opportunities for improving health,

Realizing that transport services affect all aspects of sustainability - social, economic, and environmental - and that there is a need for safe, clean, and energy-efficient transport in order to achieve green growth through low-carbon transport in Asia, the participants are thus called upon to:

1. address transport issues with the broader environmental aims of green growth to encompass the transport-energy-carbon emission nexus, from energy consumption to the emissions and climate change perspectives;
2. develop strategies for low-carbon transport including the increasing shift to energy-efficient and low carbon modes to mitigate the effects of transport on climate, and the effects of climate change on transport services and other socioeconomic sectors;
3. focus on sustainable mobility and transport demand management (TDM) tools and measures [such as - parking controls (including parking charges and pricing), road pricing and congestion charging, fuel and vehicle taxation, low and zero emission zones, car-free day, city centre pedestrianization, public transport priority and improvement measures, transit oriented development, appropriate road- space allocation to high-occupancy vehicles, efficient and affordable mass transit systems (such as BRT), and measures to help and develop non-motorized transport (walking and cycling)], etc. with stakeholder consultation and participation rather than relying only on end-of-pipe solutions, so that local air pollutants and GHG emissions from transport sector can be addressed concurrently and effectively,

thereby contributing to materializing a Low Carbon Asian Society;

4. as far as possible exploit benefits of adopting intelligent transport system (ITS), and of utilizing market mechanisms such as tax credits for environmentally friendly technologies, to make the transport services environment and people friendly, cost effective as well as energy efficient;
5. develop city partnerships and collaboration across national boundaries within Asia and between Asian cities and cities from other regions for mutual technical assistance and cooperation on implementing environmentally sound practices in transport sector, including recognition of the special needs of the post conflict countries;
6. strengthen regional cooperation, in particular among the international organizations and donors active in the region and member countries, to further improve and deepen the transport agenda at energy efficiency and climate change-related fora, including the Conference of Parties (COP), for achieving low-carbon society and green growth bearing in mind the ultimate objective of reducing global emissions under the UN Framework Convention on Climate Change (UNFCCC); and
7. request international organizations and donor communities to mobilize necessary capacity building services and financial support to the developing member countries to enable them to overcome the complex technical barriers involved in developing transport projects for taking full benefit of the GHG market under the Clean Development Mechanism (CDM) stipulated by Kyoto Protocol.

Useful Resource Materials on Environmentally Sustainable Transport

1. Asian Development Bank (ADB)

- Benoit Laplante, *Capacity Building for Environment and Social Management in Energy and Transport* (Manila: Science, Technology, and Environmental Agency and ADB, 2002) (Available at http://www.adb.org/Documents/Reports/Consultant/TA3746_LAO_LEPF.pdf).
- ADB, *Reducing Vehicle Emissions in Asia: Policy Guidelines for Reducing Vehicle Emissions in Asia* (Manila: Asian Development Bank, 2003) (Available at http://www.adb.org/documents/guidelines/Vehicle_Emissions/reducing_vehicle_emissions.pdf).
- ADB, *Energy Efficiency and Climate Change Considerations for On-road Transport in Asia* (Manila: Asian Development Bank, 2006) (Available at <http://www.adb.org/Documents/Reports/Energy-Efficiency-Transport/energy-efficiency.pdf>).
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UNITED NATIONS CENTRE FOR REGIONAL DEVELOPMENT
NAGOYA, JAPAN

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- (1) To serve as a training and research centre in regional development and planning and related fields for developing countries which may wish to avail themselves of its services;
- (2) To provide advisory services in regional development and planning and related fields at the request of developing countries;
- (3) To assist developing countries in promoting the exchanges of data on research, practical experience, teaching, and other relevant subjects in regional development and planning and related fields; and
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