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ESCAP)**

**NINTH REGIONAL ENVIRONMENTALLY SUSTAINABLE TRANSPORT (EST)
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17-20 NOVEMBER 2015, KATHMANDU, NEPAL**

**Major Challenges, Progress and Achievements by Asian
Countries on the Implementation of EST policies and measures
from Aichi (2005) to Kathmandu (2015)**

(Background Paper for Plenary Session 4 of the Programme)

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This background paper has been prepared by Todd Litman, for the Ninth Regional EST Forum in Asia. The views expressed herein are those of the authors only and do not necessarily reflect the views of the United Nations.

Major Challenges, Progress and Achievements by Asian Countries on the Implementation of EST Policies and Measures from Aichi (2005) to Kathmandu (2015)

11 November 2015

DRAFT

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2005 - Nagoya, Japan



2010 – Bangkok, Thailand



2014 – Colombo, Sri Lanka

Summary

The Intergovernmental Ninth Regional Environmentally Sustainable Transport (EST) Forum in Asia, to be held 17-20 November 2015 in Kathmandu, Nepal represents a decade of progress toward more sustainable transportation policies in the most populated and rapidly growing region of the world. This is an opportunity to look back at the accomplishments, and to look forward to future needs and opportunities for this unique and important series of conferences. This report summarizes the Forums' major challenges, progress and achievements.

Executive Summary

Leadership is the ability to create a common vision, and assemble the resources needed to make that vision reality. The world badly needs leadership for more sustainable transportation, particularly in rapidly developing countries that are now establishing the transport patterns that will exist many decades into the future.

Who provides that leadership? We do! The public officials, advisors, practitioners and experts who participate in the *EST Forums in Asia* provide essential leadership for creating more sustainable transport systems for more than half the world's populations. It's a huge challenge.

Sustainable transportation planning balances economic, social and environmental objectives. It applies comprehensive analysis and integrated planning which coordinates decision-making between different jurisdictions, sectors and groups. This approach identifies *win-win* solutions, that is, solutions to one problem that help achieve other planning objectives, for example, the pollution reduction strategies that also help reduce traffic congestion and accidents.

This is a timely issue. Asian countries are experiencing growth and urbanization at a scale that is unprecedented in history. As a result, many Asian cities are facing severe problems including congestion and pollution problems, rising inequity, and declining quality of life. Climate change, and associated threats such as sea level rise and extreme weather events, have become more apparent. These problems have become clearer and demand for action is increasing.

Fortunately, sustainable transportation advocates have swung into action, in part, through EST Forums. These international conferences are a powerful catalyst for more sustainable transport. These Forums have large leverage effects (Figure ES-1). They have helped change the way public officials and practitioners think about and solve transport problems, and helped forge alliances between diverse jurisdictions and interest groups. Many of the ideas and recommendations presented at the EST Forums are now being widely adopted throughout Asia.

Figure ES-1 EST Forum Leverage Effects

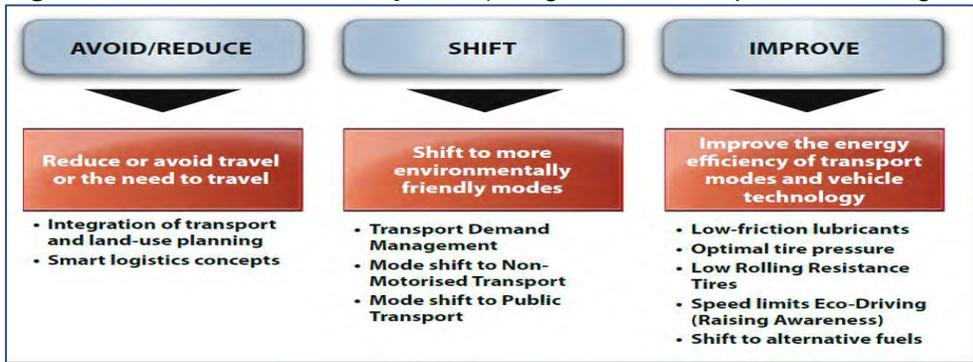


EST Forums influence federal policies, which result in more sustainable transport planning, which leads to improved walking, cycling and public transit conditions, plus other TDM strategies, which result in better economic, social and environmental outcomes. These impacts can be large and durable.

During this decade, our understanding of sustainable transport issues has improved significantly. The EST Forums originally focused on local and global air pollution, but it quickly became evident that *everything is connected*, and more comprehensive solutions can help build broader support for change. As a result, the Forums promote *win-win* emission reduction strategies which also help achieve other economic, social and environmental objectives. These are true sustainable transportation strategies.

Many win-win solutions exist. They include policies that improve resource-efficient modes, such as walking, cycling and public transit; incentives for travelers to choose the most efficient mode for each trip; and more compact and multi-modal urban development which reduces the distances that people must travel to reach destinations. These reflect the concept of *Avoid-Shift-Improve*, which provide a framework for prioritizing solutions to maximize total benefits.

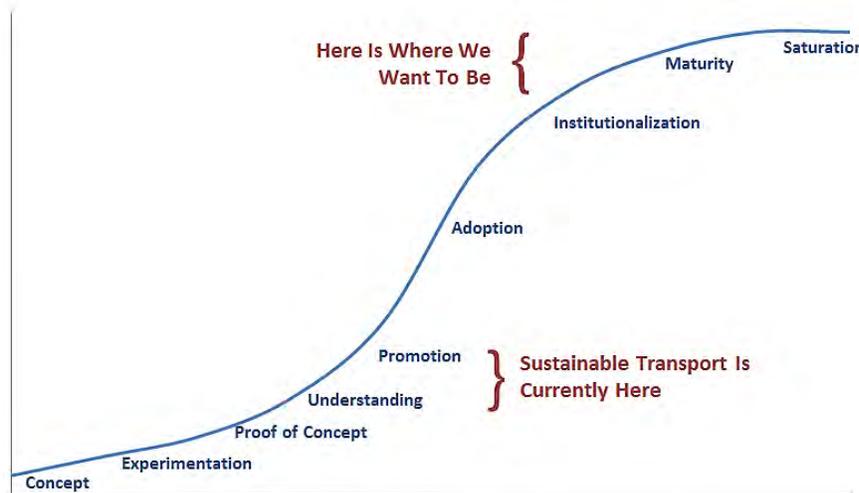
Figure ES-2 Avoid-Shift-Improve (Bongardt, Breithaupt and Creutzig 2011)



Avoid-Shift-Improve is a recipe for maximizing sustainable transport benefits.

During the last decade, many of these strategies have been tested and proven their value, and we have developed good understandings of where and how they should be implemented to maximize their benefits. This means that we are now entering the promotion and adoption stage during which these concepts will be widely implemented. It is time to scale up!

Table 26 Where We Want To Be



Sustainable transportation innovations are likely to follow a predictable growth pattern. Many strategies are currently in the “understanding” and “promotion” phases, and are starting into a “rapid adoption” phase. We should prepare to scale up to meet growing demands for smart solutions.

We face significant challenges. Many Asian countries continue policies and planning practices that reflect the old, mobility-based paradigm which favors automobile travel over more resource efficient modes, and supports sprawled urban development. These include dedicated highway funding, roadways designed to maximize vehicle traffic speed, inadequate walking and cycling facilities, restrictions on urban infill densities, and minimum parking requirements in zoning codes that essentially subsidize automobile ownership and use. These policies create a self-reinforcing cycle of automobile-dependency and sprawl.

Creating more sustainable transport systems requires more than just good ideas; it requires changing the paradigm people use to define transport problems and evaluate potential solutions, and more comprehensive and integrated planning. This means, for example, that we recognize the important roles that walking, cycling and public transit can play in an efficient and equitable transportation system, and so make significant investments in these modes.

Critical sustainable transportation strategies such as road tolls, parking fees and bus-lanes sometimes face significant political opposition by people and groups who only perceive their costs and ignore their numerous benefits. Sustainable transportation can provide many diverse benefits, including some that are outside the traditional scope of transport planning, such as increased affordability, improved public fitness and health, and local economic development. We need to do a better job of communicating these benefits. For example, we can do a better at communicating the full benefits of bus-lanes including benefits to people who do not use that mode, such as reduced congestion for motorists and reduced parking costs to businesses.

We need better tools for quantifying the economic development benefits of resource-efficient transport. Many Asian countries import vehicles and fuel, so policies that reduce vehicle ownership and use, and so reduce consumer expenditures on imported goods, tend to increase economic productivity. Sustainable transport policies can also increase productivity by expanding employment opportunities and reducing road and parking facility costs.

As sustainable transportation planning scales up, it will be important to educate and inspire a much larger number of practitioners – the planners, engineers, designers, technicians and law enforcement officials who make many of the decisions that affect transport conditions and activities. There is a need for regional and local professional development programs, such as lectures, one-day workshops, webinars and training courses organized by professional organizations and universities.

The EST Forums in Asia demonstrate the value of leadership. During the last decade they helped create a shared vision and assemble the resources needed to create more efficient and equitable transport systems. Since the first EST Forum in 2005, many sustainable transport concepts identified in these forums have been tested and proven. We now know that more integrated and multi-modal planning, efficient transport pricing, walking and cycling improvements, and Bus Rapid Transit can succeed. It is now time to scale up implementation of these concepts in order to achieve their full potential.

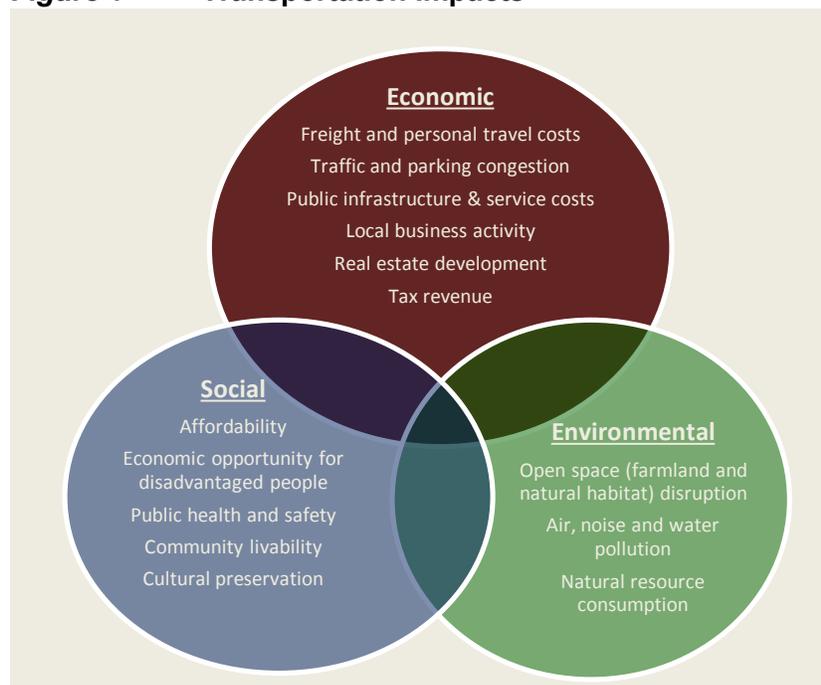
Introduction

Leadership is the ability to create a common vision, and assemble the resources needed to make that vision reality. The world badly needs leadership for more sustainable transportation, particularly in rapidly developing countries that are now establishing the transport patterns that will exist many decades into the future.

Who provides that leadership? We do! The public officials, advisors, practitioners and experts who participate in the *EST Forums in Asia* provide essential leadership for creating more sustainable transport systems for more than half the world's populations. It's a huge challenge.

Transportation has diverse economic, social and environmental impacts, including many that are indirect and long-term (Figure 1). Conventional planning tends to overlook and undervalue many of these impacts. Sustainable transportation planning tries to balance economic, social and environmental objectives. It applies more comprehensive analysis and integrated planning which coordinates decision-making between different jurisdictions, sectors and groups. This approach identifies *win-win* solutions, that is, solutions to one problem that help achieve other planning objectives, for example, the pollution reduction strategies that also help reduce traffic congestion and accidents, and improve mobility options for non-drivers.

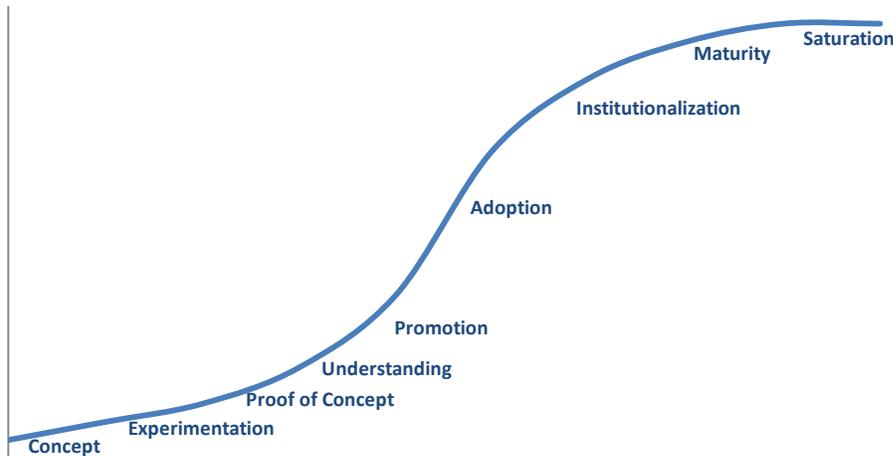
Figure 1 **Transportation Impacts**



Transportation policies can have many impacts. Sustainability planning considers all of them, including impacts that are indirect and long-term, which are sometimes overlooked or undervalued in conventional planning. As a result, sustainable transport planning requires more comprehensive analysis than was previously applied.

Sustainable transportation implementation requires significant changes in the way we think about transport problems and evaluate solutions. Innovation deployment typically follows an S-curve, starting with a concept that is tested, proven, promoted, adopted, institutionalized, and eventually matures and saturates (Figure 2).

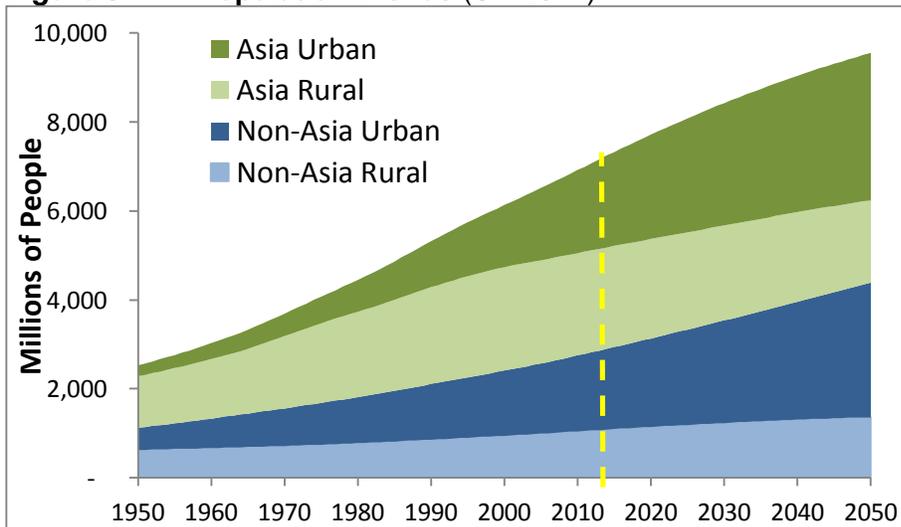
Figure 2 Typical Innovation Deployment S-Curve



Most innovations follow a predictable deployment curve, starting with a concept an eventually reaching saturation. Sustainable transport is currently in the early stages of this curve.

Sustainable transportation is still in the early stages of this cycle; many of the concepts have been tested and proven, and are increasingly understood by leaders in the field. For example, those of us involved in the EST Forum and work with partner organizations have developed a good understanding of why and how to implement more multi-modal transport planning, public transit service improvement, road and parking pricing reforms, more integrated transport and land use planning, and similar policy innovations. However, we are a very small portion of the stakeholders involved in transport decisions that will need to change for sustainability sake.

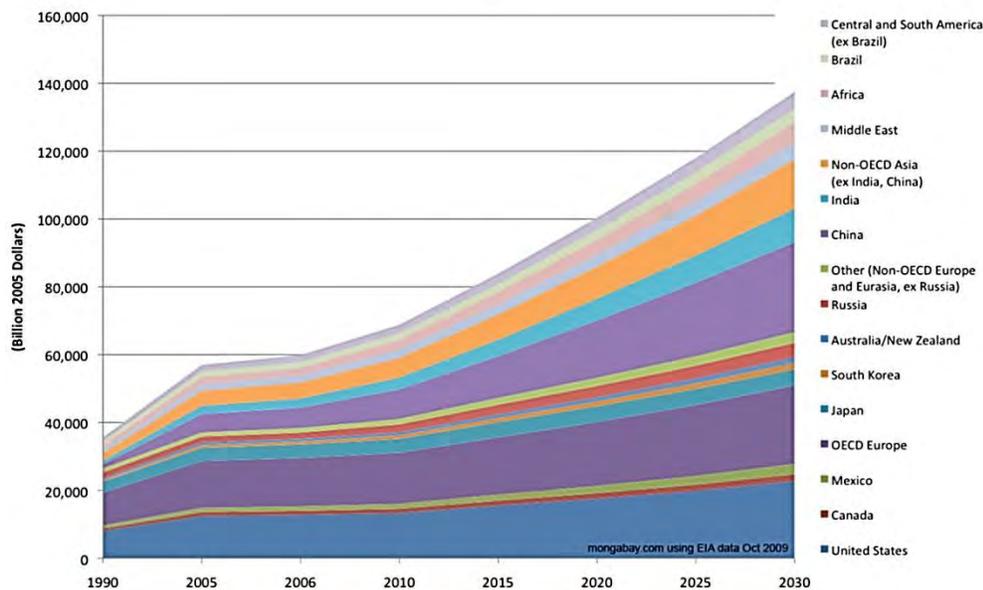
Figure 3 Population Trends (UN 2014)



Asian countries are growing and urbanizing. Between 2015 and 2050, Asian populations are projected to grow from 4.4 to 5.6 billion people, and Asian urban residents are projected to grow from 2.1 to 3.3 billion.

This is a timely issue. Our world is growing rapidly. Between 1950 and 2050 the world's human population is projected to quadruple, and economic activity will grow even more, particularly in Asian countries, as illustrated in figures 3 and 4. How we accommodate the resulting growth in travel demands has huge economic, social and environmental impacts. Inefficient transport causes problems including traffic and parking congestion, high costs to households and governments, social inequity, traffic accidents, air and noise pollution, reduced public fitness and health, and open space (farmland and natural habitat) displacement. Sustainable transport policies can significantly reduce many of these problems.

Figure 4 Gross Domestic Product (GDP) By Region (EIA Data)



Asian countries are also experiencing rapid economic growth.

Decision-makers need practical guidance concerning how to implement these innovative solutions. During the last decade, the *Environmentally Sustainable Transportation (EST) Forums in Asia* have provided such guidance. Starting in 2005, high-level Asian officials and their advisors have met to discuss, learn and coordinate transportation policies that balance economic, social and environmental goals. These forums provide an opportunity for decision-makers and experts to share information and coordinate programs.

How well are Asian countries implementing sustainable transportation planning? What roles have the EST Asia Forums played in this transition? What should it do in the future? This report examines these issues.

Overview of EST Events

The EST Forums were preceded by the 2003 *International Conference on Environmentally Sustainable Transport in the Asian Region* and the 2004 *Manila Policy Dialogue on Environment and Transportation in the Asian Region*. This produced the Manila Statement, which asked the United Nations Centre for Regional Development (UNCRD) to establish a regional forum for promoting environmentally sustainable transport, which led to the establishment of the *EST in Asia Forums*. These events involve senior officials and their advisors, development agencies, international and national civil organizations, plus experts from various disciplines. Many of these events produced formal statements or declarations, as summarized in Table 1.

Table 1 Events Summary

Time and Place	Event	Documents	Countries	People
March 2003 Nagoya, Japan	International Conference on Environmentally Sustainable Transport in the Asian Region			
January 2004 Manila, the Philippines	Manila Policy Dialogue on Environment and Transport in the Asian Region.	<i>Manila Statement</i>	13	
August 2005 Nagoya, Japan	First Meeting of the Regional EST Forum in Asia	<i>Aichi Statement</i>	13	80
December 2006 Yogyakarta, Indonesia	Second Meeting of the Regional EST Forum in Asia		14	100
April 2007 Kyoto, Japan	Asian Mayors' Policy Dialogue for the Promotion of Environmentally Sustainable Transport in Cities	<i>Kyoto Declaration</i>		
March 2008 Singapore	Third Meeting of the Regional EST Forum in Asia		22	120
November 2008 Bangkok, Thailand	Special Event of Asian Mayors for the Signing of the Kyoto Declaration for the Promotion of Environmentally Sustainable Transport			
February 2009 Seoul, Rep. of Korea	Fourth Meeting of the Regional EST Forum in Asia	<i>Seoul Statement</i>	22	150
March 2010 Seoul, Rep. of Korea	Special Event of Asian Mayors for the Signing of the Kyoto Declaration for the Promotion of Environmentally Sustainable Transport			
August 2010 Bangkok, Thailand	Fifth Meeting of the Regional EST Forum in Asia. Adopted	<i>Bangkok Declaration for 2020</i>	22	200
December 2011 New Delhi, India	Sixth Meeting of the Regional EST Forum in Asia		21	160
April 2013 Bali, Indonesia	Seventh Meeting of the Regional EST Forum in Asia	<i>Bali Declaration</i>	23	200
November 2014 Colombo, Sri Lanka	Eighth Meeting of the Regional EST Forum in Asia	<i>Colombo Declaration</i>	40	1,000
November 2015 Kathmandu, Nepal	Ninth Meeting of the Regional EST Forum in Asia	?	?	?

Fourteen major international events have promoted sustainable transportation in Asia. These events are helping to transform policies and planning practices to create more efficient and equitable transport systems

These events have the following goals:

- Facilitate policy dialogue and provide a strategy for sharing best practices, policy instruments, tools, and technologies in relation to various aspects of EST among Asian countries.
- In consultation with subsidiary expert groups, facilitate and provide necessary advisory support for the formulation of national EST strategies and action plans on EST for selected countries.
- Support the implementation of action plans into practice through the participation of international organizations and international development and donor agencies.
- Help establish linkages with other ongoing regional and international activities/initiatives.
- Develop national strategies and action plans on environmentally sustainable transport.

These events attract numerous partners including governments, government agencies, development and research organizations. These include:

The Asian Development Bank (ADB), EMBARQ (The World Resources Institute's Center for Sustainable Transport), German International Cooperation (GIZ), ICLEI-Local Governments for Sustainability, Innovation Center for Mobility and Societal Change (InnoZ), Institute for Global Environmental Strategies (IGES), Institute for Transportation and Development Policy (ITDP), International Union of Railways (UIC), Partnership on Sustainable, Low Carbon Transport (SLoCaT), SAFER - Vehicle and Traffic Safety Centre, South Asia Co-operative Environment Programme (SACEP), TERI University, The Korean Transport Institute (KOTI), The World Bank (WB), University of Gothenburg, United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP), World Health Organization (WHO).

These events have inspired partner events:

- *The Asian Mayors' Policy Dialogue for the Promotion of Environmentally Sustainable Transport in Cities*, during which mayors from 23 cities in 14 Asian countries shared best practices and adopted the Kyoto Declaration, which commits to further EST development in Asia. To date, 44 cities have signed the statement during the *Special Event of Asian Mayors for the Signing of the Kyoto Declaration*, held in 2008 and 2010.
- *The Sustainable Transport Forum for Latin America* (Foro de Transporte Sostenible para America Latina), which first met in June 2011 in Bogota, Columbia, and produced the *Bogota Declaration*.

In addition to plenary sessions during which delegations conduct formal business, EST Forums include extensive information sharing, including background papers, presentations by leading experts and government officials, and panel discussions which explore current issues. For example, 12 background papers, 11 city reports, and 16 country reports were presented at the 2014 Forum in Colombo, Sri Lanka. In addition, there were numerous workshops and special events dealing with specific issues.

The EST Forums have inspired several declarations and statements which establish sustainable transportation principles and goals, and allow cities and countries to reaffirm their commitment to work together toward more sustainable transportation.

EST Forum Declarations and Statements

- [Kyoto Declaration \(2015\)](#)
- [Aichi Statement \(2005\)](#)
- [Bali Declaration \(2013\)](#)
- [Bangkok 2020 Declaration \(2010\)](#)
- [Colombo Declaration \(2014\)](#)
- [Manila Statement \(2004\)](#)
- [Seoul Statement \(2009\)](#)

The EST Forums in Asia have inspired several declarations and statements. These documents establish sustainable transportation principles and goals, and allow cities and countries to reaffirm their commitment to toward these goals.

The First EST Forum held in Nagoya, Japan produced the *Aichi Statement*, which identified twelve elements that should be considered for environmentally sustainable transportation (below). Subsequent documents have built on this Statement. The 2010 *Bangkok Declaration* established specific goals to be achieved by 2020, and identified indicators for measuring progress toward those goals.

Twelve Aichi Statement Elements

- | | |
|--|---|
| 1. Public health | 7. Environment and people friendly urban infrastructures |
| 2. Road safety and maintenance | 8. Cleaner fuels |
| 3. Traffic noise management | 9. Strengthening road side air quality monitoring and assessment |
| 4. Social equity and gender perspectives | 10. Vehicle emission control, standards, and inspection and maintenance |
| 5. Public transport planning and transport demand management (TDM) | 11. Land use planning |
| 6. Non-motorized transport | 12. Strengthening knowledge base, public participation and awareness |

The Forums are well documented: each has a website that contains agendas, backgrounders, technical reports, presentations, city and country annual reports, and declarations.

EST Websites

The screenshot shows the website for the Eighth Regional EST Forum in Asia. Key information visible includes:

- Event Title:** Eighth Regional EST Forum in Asia (Integrated Conference of BAQ2014 and Intergovernmental Eighth Regional EST Forum in Asia)
- Dates:** 19 Nov 2014 - 21 Nov 2014
- Location:** Colombo, Sri Lanka
- Venue:** Bandaranaike Memorial International Conference Hall, Colombo, Sri Lanka
- Theme:** Next Generation Solution for Clean Air and Transport - towards Sustainable and Livable Society in Asia
- Co-organizers:** Ministry of Environment and Renewable Energy, Sri Lanka; Ministry of Transport, Sri Lanka; Ministry of the Environment, Japan; United Nations Centre for Regional Development (UNCRD).

EST Forum Websites

About Regional EST Forums

- [Eighth Regional EST Forum \(2014\)](#)
- [Seventh Regional EST Forum \(2013\)](#)
- [Sixth Regional EST Forum \(2011\)](#)
- [Fifth Regional EST Forum \(2010\)](#)
- [Fourth Regional EST Forum \(2009\)](#)
- [Third Regional EST Forum \(2008\)](#)
- [Second Regional EST Forum \(2006\)](#)
- [First Regional EST Forum \(2005\)](#)

The EST Forums are well documented; each has a website where key documents are posted. Each Forum city and country delegation submits an annual report which responds to several standard questions. There are now several hundred reports.

These documents provide a useful way to evaluate trends and progress over the last decade. Below are some typical statements and key observations from these documents.

Examples from the Second EST Forum (2006)

<p>Key Elements of Integrated EST Strategy</p>	<p>Other Issues</p> <ul style="list-style-type: none"> • Long term vision required • Governance Issues • Institutional Strengthening and Capacity Development • Climate change issues need to receive greater weight • Second hand vehicles • Unregistered vehicles and insurance issues • Sustainable transport indicators: measurable • Out-of-the-box thinking required but solutions need to be local • Energy efficiency measures needed. Fuel economy standards
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Current Conditions

Many reports, particularly those from lower-income countries, indicate that current conditions are inadequate, including severe traffic and parking congestion, poor walking and cycling conditions, inadequate public transport services, high accident rates and pollution problems.

Examples from the Third EST Forum (2008)

<p>Regional Dimensions</p> <ul style="list-style-type: none"> • Trade liberalization and its regional impacts • The export of vehicles • Time to take a regional perspective on vehicle standards, fuel issues, etc. • Standards and regulations are important, but we need ACTION now 	<p>Public Transport Crisis</p> <p>Anxious passengers waiting for bus, struggling to get in, overcrowded bus.</p>
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Policy Reforms

Many countries and cities report that they are starting to implement strategic policy reforms, including changes in funding and planning priorities, and more strategic planning to support sustainable transport. Many of these reflect ideas and information from the EST Forums.

Examples from the Fourth EST Forum (2009)

<p>Common Trends</p> <p>Countries are now planning substantive EST Actions</p> <ul style="list-style-type: none"> • Actively promoting mode shift from private motor vehicles to public transport (rail and bus) • Change institutional structures to make EST possible • Countries are also making financing available for EST • NMT still has only modest priority • EST is not (yet) driven by climate change but by local environment, safety, economics. 	<p>Transportation Demand Management Measures</p> <p>2. TDM Measures in Korea</p> <p>Supply Policies: BRT, Exclusive Median Bus Lane, Urban Bus Reform, Transit Facility Expansion, BIS/BMS, Business Taxi, Bicycle Revitalization, Pedestrian Priority Zone, Parking Cap, Resident Priority Parking, Weekly No Driving Day Program, TDM in Private Sector, Congestion Fee.</p> <p>Restriction Policies: (Implied by the diagram structure)</p>
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Current EST Implementation Efforts

Many countries and cities report significant and growing commitments to sustainable transport policies and programs, including traffic management, pedestrian and cycling improvements, public transit improvements, more integrated planning, vehicle emission control and safety programs, and deployment of new technologies that facilitate green travel. Many of these reflect sustainable transportation programs and strategies promoted in EST Forums.

Examples from the Fifth EST Forum (2010)

<p>Urban Transportation Problems</p> <ul style="list-style-type: none"> • Uncontrollable car and motorbike growth • Limited transportation network, preferable to cars • Mismanagement of transportation facility utilization • Unstructured transportation network • Uncontrollable urban development • Population and economic growth which results in high demand growth 	<p>NATIONAL KEY RESULT AREA</p> <ul style="list-style-type: none"> • Established in Oct 2009 • National Key Result Area Urban Public Transport (NKRA-UPT) to increase modal share for public transport from 15% to 25% by 2012.  <ul style="list-style-type: none"> • Initiatives: <ul style="list-style-type: none"> – Bus - dedicated Bus Right of Ways (ROWs), increased quality and coverage, stringent enforcement – Rail - increase capacity of rail based transportation – Improving integration facilities and services – Rationalisation of bus networks – Performance Monitoring 
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Challenges

Countries and cities report various types of obstacles to more sustainable transportation implementation, including inadequate and conflicting institutions, conflicting laws, political resistance to change, and inadequate funding for more sustainable transport modes.

Examples from the Sixth EST Forum (2011)

<p>Public transport planning</p>  <ul style="list-style-type: none"> • Urban Transport Program for Highly Urbanized Cities <ul style="list-style-type: none"> ✓ Development of Mega Manila Public Transportation Planning Support System ✓ Development of Public Transportation Strategic Plan for Metro Cebu ✓ Sustainable Urban Transport in Davao City (SUTra-DC) • Public Transport Network Integration and Improving Mass Transit Systems <ul style="list-style-type: none"> ✓ LRT 1 to south of Metro Manila (Cavite City) ✓ Line 1 North Extension (Closing the Loop for MRT-LRT Lines) ✓ Line 2 MRT eastward (Masinag) and westward ✓ Reconfiguration of the North Rail Line 	<p>Expected Outcomes</p> <ul style="list-style-type: none"> • Improved traffic flow in the locations of project intervention due to reduced congestion. • 10% increase in vehicular traffic throughout particularly for those who use non-motorized vehicles and public transport, especially women • 10% decrease in the number of traffic accidents <p>Complements Bangkok 2020 Goals</p>
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Impacts of EST Forums

Many of the documents reviewed reference and build on information and guidance presented at previous EST Forums. Many city and country reports indicate that government policies are changing in response to this information and goals established in EST Forum declarations.

Examples from the Seventh EST Forum (2013)

Urban Transport Challenges	Bangkok Declaration for 2020 - Sustainable Transport Goals for 2010 - 2020															
		SHIFT	IMPROVE	CROSS-CUTTING STRATEGIES												
	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9	Goal 10	Goal 11	Goal 12	Goal 13	Goal 14	Goal 15	Goal 16	Goal 17	Goal 18	Goal 19
<ul style="list-style-type: none"> Lack of institutional framework Gaps in capacity Low penetration of public transport No enabling environment for NMT Poor road quality Limited use of technology & innovation 	National EST Strategy	x	x													
	- Promotion of BRT systems for metro cities		x												x	
	- Expansion of urban rail in Metro Manila		x													
	- Replacement of 2-stroke tricycles			x												x
	- Bike on Bikes off - VSP		x													
	Alternative Fuels															
	- Biofuels as transport fuels						x									
	- Natural gas for public transport						x									x
	- Autogas (LPG) program						x									
	- Upgrade engine replacement to LPG						x									x
	Fuel Efficiency															
	- Road Transport Patrol											x				
	Nautical Highway System (BRTS)						x									
	Tricycle Management															
	Bikeways and Walkways Program in Metro Manila		x													
Road User's Tax Law - Special fund for air pollution control															x	
Public transport strategic plan for Metro Cebu		x														

Conclusions

This review suggests that, despite large geographic, economic and historical differences, Asian countries and cities follow similar patterns: as countries develop and more residents purchase motor vehicles, traffic congestion, accidents, pollution and parking problems significantly increase. The EST Forums help countries respond to these problems. They help government officials, policy advisors, practitioners and civil organizations share information and develop practical guidance, targets and programs. During the decade of EST Forums, we have gained a much better understanding of transport problems and potential solutions, resulting in more sustainable transport policies and programs. Although it is difficult to quantify the Forums' influence – it is impossible to determine exactly how differently transport policies would have developed had the Forums never occurred – the evidence indicates that the impacts are large; similar solutions would probably be implemented eventually, after less cost-effective solutions were tried and failed, but the Forums probably accelerated essential changes by many years.

Examples from the Eighth EST Forum (2014)

Conclusion

EIA & HIA

Thailand's EST Master Plan 120 projects/plans/policies

Avoid

- Urban planning
- Complex city

Shift

- Mode of Transport : public and mass transit
- Freight :road to rail
- Alternative Fuel
- NMT

Improve

- Vehicle/fuel standard
- Technology

Cross cutting

- Safety : Decade of road safety
- Climate Change
- Awareness

Most difficult Not yet

Implementing

Largely Implemented

Major achievements/new initiatives based on Bangkok Declaration

- Most urban centers now have integrated land use and transport plans
- Nationwide backbone fiber-optic network
- Transport identified as top sector in Technology Needs Assessment
- National Appropriate Mitigation Actions (NAMAs) for Transport sector is being developed
- Plan for BRT drawn but remains unimplemented due to high cost of related infrastructure and buses
- More comfortable and less polluting inter-city buses
- Reserved seats for people with special needs

The Context of EST Forums

Sustainability emphasizes the integrated nature of human activities and therefore the need for coordinated planning among different sectors, groups and jurisdictions. *Sustainable transport planning* recognizes that transport decisions affect people in many ways, so a variety of objectives and impacts should be considered in the planning process. Although they are called *Environmentally Sustainable Transportation Forums*, they actually consider a wider scope of issues including social equity, health and safety, economic development, institutional capacity building, and improved governance. This reflects the true concept of sustainability which strives to balance economic, social and environmental goals.

The following are important context issues that affect these events.

A Shifting Transport Planning Paradigm

These Forums have occurred during a *paradigm shift*, a fundamental change in the way people think about transportation problems and evaluate potential solutions (ADB 2009; Litman 2013). The old paradigm evaluated transport system performance based primarily on *mobility* (physical travel), and so assumed that the goal is to maximize vehicle traffic speed and distance. This perspective tends to favor automobile travel. The new paradigm recognizes that mobility is seldom an end in itself, that the ultimate goal of most transportation is *accessibility* (people’s ability to reach desired services and activities), and so considers a wider range of impacts and options. This perspective recognizes the important roles that walking, cycling and public transit can play in an efficient and equitable transport system, and supports more comprehensive planning that results in *win-win* solutions, that is, the solution to one problem that also help achieve other planning objectives. Table 2 compares various facets of this shift.

Table 2 The Changing Transportation Planning Paradigm

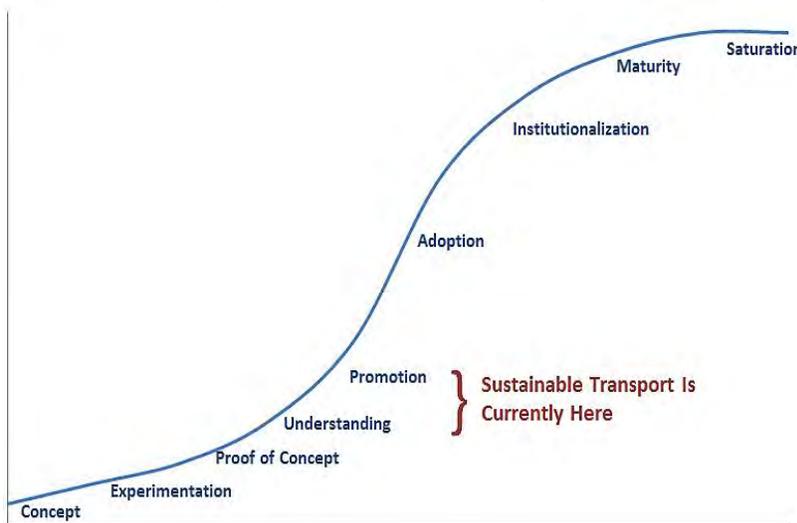
	Old	New
Definition of Transportation	<i>Mobility</i> (travel speed and distance)	<i>Accessibility</i> (ability to obtain goods, services and activities)
Modes considered	Motor vehicles. Walking, cycling and public transit are considered inferior, to be replaced by private motor vehicles when possible	Walking, cycling, automobile, public transit, delivery services and telecommunications are all recognized as important components of an efficient and equitable transport system
Impacts to consider (performance indicators)	Traffic speed and delay, roadway level-of-service, vehicle operating costs, vehicle crash rates	Multi-modal level-of-service, land use accessibility, transport affordability, basic mobility for non-drivers, per capita crash rates, pollution emissions
Objectives	Maximize mobility (the amount people can travel)	Various economic, social and environmental objectives
Transportation improvement options	Roadway improvements to increase capacity, speed and safety	Improvements to various modes, transportation demand management, more compact, “Smart Growth” development

A paradigm shift is changing the way we think about transportation problems and evaluate solutions.

The Process of Change

The EST Forums are intended to change in the way that stakeholders think about transport problems, and support innovative solutions. The key words are *change* and *innovation*, so it is useful to think about how such changes occur. Innovation deployment typically follows an S-curve, starting with a concept that is tested, proven, promoted, adopted, institutionalized and eventually matures and saturates.

Figure 5 Typical Innovation Deployment S-Curve



Most innovations follow a predictable deployment curve, starting with a concept and eventually reaching saturation.

Most sustainable transport strategies are currently in the early stages of this curve, where we gain understanding and promote new concepts, but many are starting to experience rapid adoption.

We can evaluate various sustainable transport concepts and programs in terms of their current deployment status (Table 3). Most are currently in the early stages, they have been successfully tested and proven, and we are gaining understanding about where and how they should be implemented. They are now at the promotion and rapid adoption stage. It's time to scale up!

Table 3 The Changing Transportation Planning Paradigm

Concepts and Programs	Deployment Stage
Multi-modal planning	The concept is well understood by experts, but many details still require promotion and wider adoption.
Bus Rapid Transit	The concept is well tested and understood. It is now widely promoted and increasingly being adopted around the world.
Complete Streets policies	The concept has been proven in developed countries and is starting to be tested in developing countries.
Parking management	The concept has been proven in some cities, but many people misunderstand it, so many cities require more information and promotion.
Efficient road pricing	The concept has been successfully tested in a few cities, but many people misunderstand and fear it, so more promotion is needed

Different sustainable transport policy and project innovations are at different stages in the deployment cycle. Many are entering the "Rapid Adoption" stage in which they expand significantly.

Integrated Planning

Sustainable transportation planning requires integrated planning. There are many aspects of integration, including coordination between different governments, jurisdictions, agencies and groups. The inefficiencies of disjointed and sometimes contradictory planning, and the need for more integration, are frequent topics in the EST Forums. More integrated planning often requires institutional and governance reforms, and improved coordination between different jurisdictions and agencies.

Understanding Impacts and Outcomes

Effective planning generally begins with a clearly-defined vision or goal which identifies what the plan is ultimately intended to achieve. Decision makers have certain policies, sometimes called *levers*, like the controls of a machine, that can guide changes. Table 4 lists examples of the types of policies that affect transportation sustainability.

Table 4 Examples of Policies That Affect Transport Sustainability

Transport	Land Use
<ul style="list-style-type: none"> • Roadway construction, design and operation • Provision of public vehicle parking • Road and parking pricing (tolls and fees) • Provision of footpaths, bikepaths and bicycle parking • Provision of public transit services • Regulations regarding private transport services • Transportation demand management programs 	<ul style="list-style-type: none"> • Regulations that control where development is allowed • Provision of public infrastructure (roads, water, power, telecommunications, etc.) • Building regulations (allowable density, heights, allowable uses, etc.) • Parking requirements and regulations

Various policies can affect transport systems and land use development, and therefore sustainability.

To determine which policies best achieve sustainability goals, it is important to understand their physical impacts and their ultimate economic, social and environmental outcomes, as illustrated in Figure 6. Although some of these relationships are obvious – for example, increasing fuel taxes or parking fees tends to reduce automobile travel, and improving public transport convenience and comfort tends to increase ridership – specific impacts and outcomes can be difficult to predict. Targeted research can create models that predict how well a particular policy change can help achieve sustainable development targets.

Figure 6 Policies, Impacts and Outcomes (Litman 2014)



This study investigates how public policies affect economic, social and environmental outcomes.

Implementation Progress and Challenges

This section reviews progress and challenges related to key sustainable transport factors.

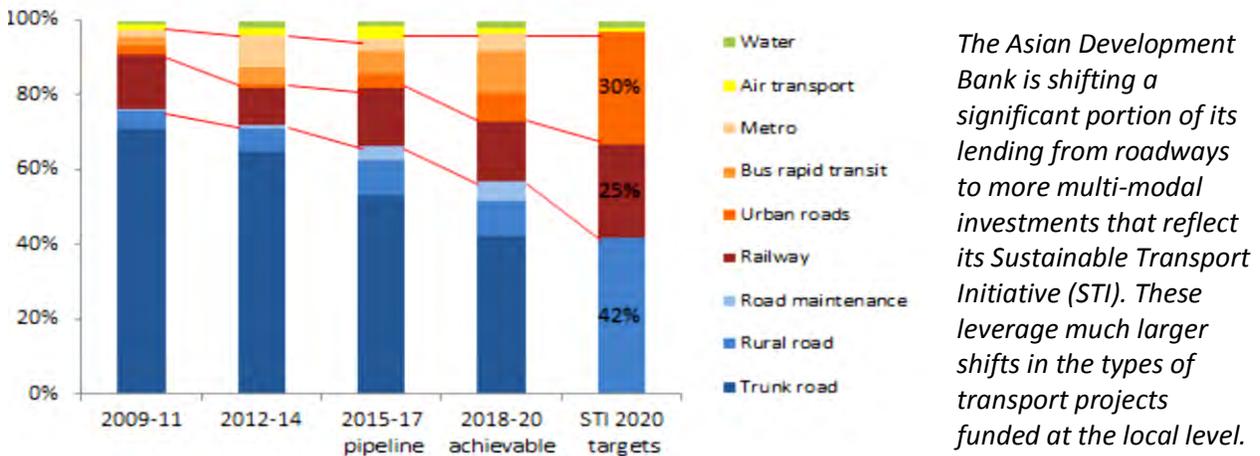
Policies and Programs

Transportation policy refers to how transport is financed, planned and regulated. Some Asian regions are still developing basic transport infrastructure, such as paved roadways, essential rail lines and ports. However, once this basic network exists, it is increasingly important to implement more multi-modal planning and demand management strategies to ensure that those facilities are used efficiently.

Progress

Asian countries and cities are making significant progress toward more sustainable transport policies. One of the most profound changes involves more sustainable policies and planning practices by development agencies such as the Asian Development Bank (ADB) and the Japan International Cooperation Agency (JICA). For example, the ADB established a Sustainable Transport Initiative (STI) in its *Strategy 2020* strategic plan, and is developing technical resources to support this initiative. The plan’s transport subsector targets include major shifts from roadway to urban transport and railways investments, as illustrated in Figure 7. These changes are very important because of their leverage effects: if development banks favor more sustainable investments, many jurisdictions will change their planning practices in response.

Figure 7 Asian Development Bank Transport Lending Trends (ADB 2014)



Many countries and cities are making policy shifts toward more sustainable transport. For example, the Republic of Korea has “green” transportation policies that support resource efficiency, land preservation and urban quality of life (KOTI 2011). Similarly, the Indian Ministry of Urban Development’s *National Transport Policy Development Committee* (NTDPC 2012) recommends that, “Urban transport should grow along a sustainable path to support the desired economic growth, protect the environment and to improve the quality of life,” and provides specific recommendations for this based on the principles of *Avoid, Shift and Improve*.

Challenges

Despite these changes, many jurisdictions still apply automobile oriented planning, with continued construction of urban highways and flyovers, and much smaller investments in walking, cycling and bus transit. Similarly, many cities continue to restrict urban development density and heights, and impose high minimum parking requirements.

A major challenge is the large number of existing policies and planning practices that must be changed to support sustainable transportation. For example, developing a Bus Rapid Transit (BRT) network usually requires changing regional transportation plans, funding practices, roadway design, traffic management and enforcement, public transit planning, transit payment systems and user information, changes to zoning codes, and parking management practices

Another challenge is the large number of policies that affect transport but are not directly controlled by transport agencies, such as those in Table 5. For example, many governments support housing development for lower-income households, people with disabilities and other special groups; but such development often occurs where land is cheap, even if such locations are isolated and increase transport problems. Integrated sustainable transport policies will result in more accessible development, particularly for low-income households and people with disabilities, who are significantly burdened by isolated locations.

Table 5 Policies Not Directly Controlled by Transport Agencies

Policy	Impacts on Sustainable Transport Outcomes
Domestic vehicle production subsidies	Increases motor vehicle ownership
Fuel subsidies and low taxes	Increases motor vehicle travel
Restrictions on urban infill development densities, and minimum parking requirements	Reduces development density and increases automobile ownership and use
School consolidation	Students must travel further, resulting in more vehicle trips
Public housing development on cheaper land at the urban fringe	Encourages households to own more cars and drive more than they otherwise would
Citing of high employment industries in areas with poor travel options	Encourages automobile commuting

Many policies that affect transportation sustainability are not directly controlled by transport agencies.

Another major challenge is the long time-frame required for many policy changes to achieve desired effects. For example, a policy to improve active transport (walking and cycling) may require two or three years to develop a plan and design guidelines, and it may take a decade or more to develop enough sidewalks, crosswalks and bike lanes to create a functional network that substantially change how people travel. Similarly, changes in development policies to encourage more construction of affordable-accessible housing can usually only affect a small portion of a city's total housing supply; much of the additional housing developed will be completed decades in the future. For these reasons, sustainable transport planning requires long-term thinking, and patience.

Institutions

Many Asian government, research and academic organizations now support sustainable transport. Many of these are EST Forum participants. During the last decade these institutions have expanded, matured, and become more influential. Examples are described below.

Government Ministries and Agencies

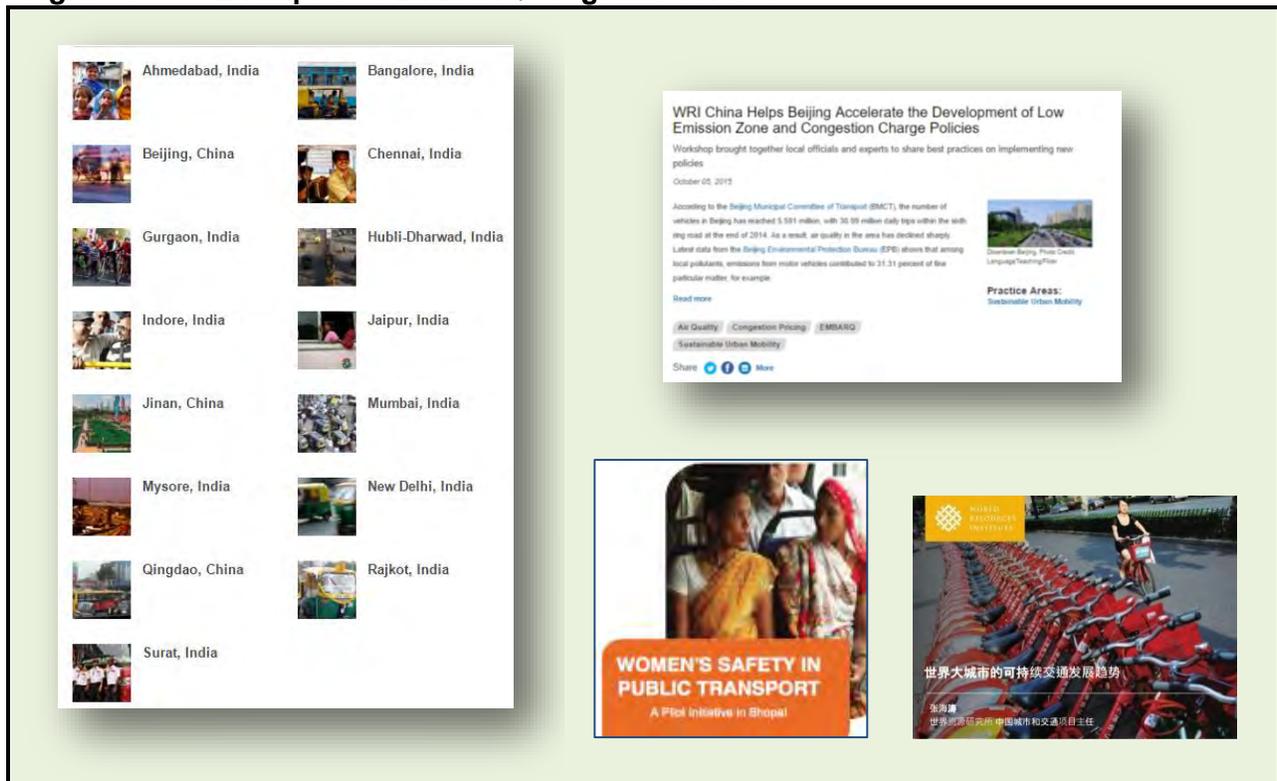
Government ministries and agencies have important roles to play in creating more sustainable transportation. These organizations directly affect transport policies and planning practices. As the review of EST country and city reports indicates, many Asian transportation agencies are implementing more sustainable policies and planning practices.

International Organizations

EMBARQ

Since 2002, EMBARQ has worked to make sustainable transport a reality in cities throughout the world. It has offices in Brazil, the people’s Republic of China, India, Mexico, Turkey, and the United States. It works with local and national authorities, businesses, and civil society to create safe, accessible, and attractive urban mobility solutions. EMBARQ is part of World Resources Institute (WRI) Ross Center for Sustainable Cities. It is an EST Asia partner.

Figure 8 Examples of EMBARQ Programs in Asia

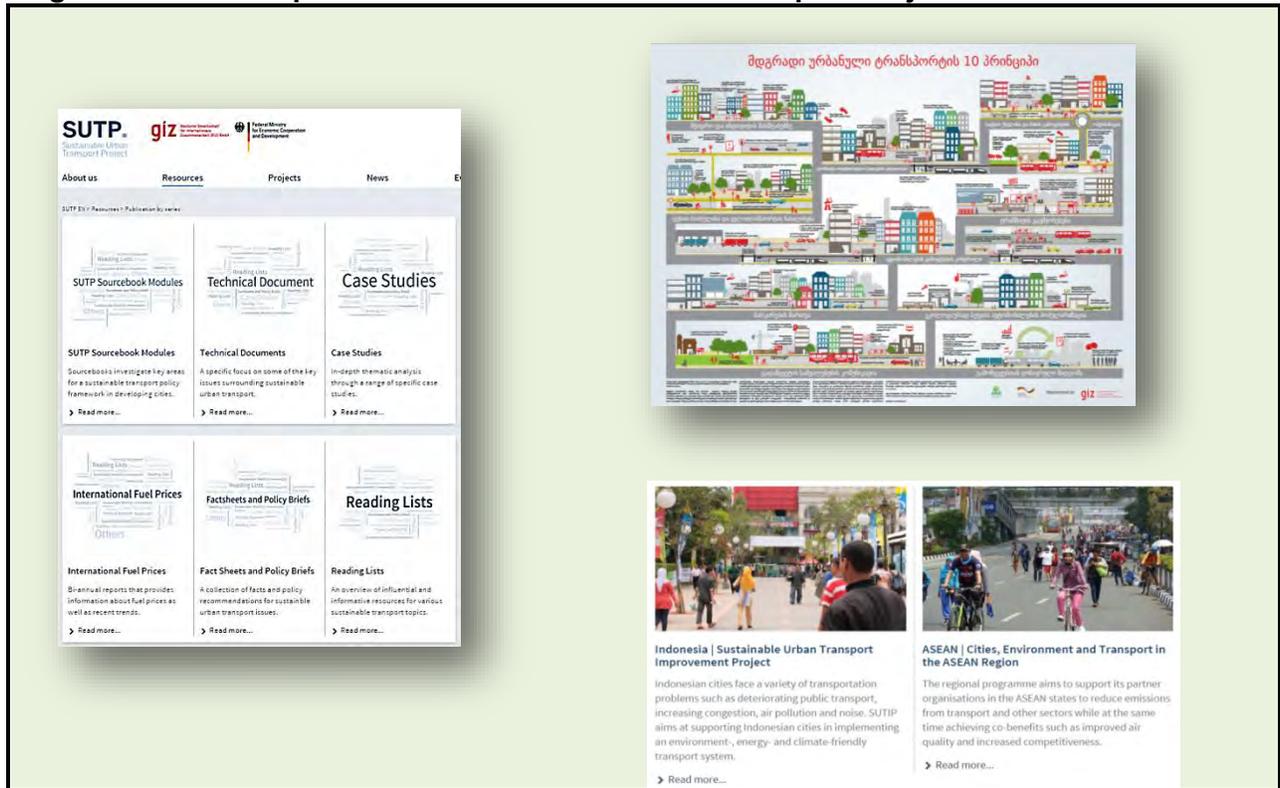


EMBARQ works to promote sustainable urban development around the world, particularly in Asia. It sponsors research, information sharing, publications and professional development programs.

German International Cooperation

The German International Cooperation (GIZ) Sustainable Urban Transport Project (SUTP) provides policy advice and capacity building to help create more sustainable cities. During the last decade, SUTP has published dozens of documents and sponsors numerous technical sharing programs, many targeted to Asian countries. It is an EST Asia partner.

Figure 9 Examples of GIZ Sustainable Urban Transport Project Resources in Asia



The GIZ Sustainable Urban Transport Project (SUTP) provides policy advice and capacity building to help create more sustainable cities.

ICLEI-Local Governments for Sustainability

The International Council for Local Environmental Initiatives (ICLEI) is the world's leading network of over 1,000 cities, towns, and metropolises committed to building a sustainable future. It directly impacts over 20% of the global population.

Figure 10 Examples of ICLEI Programs and Resources in Asia

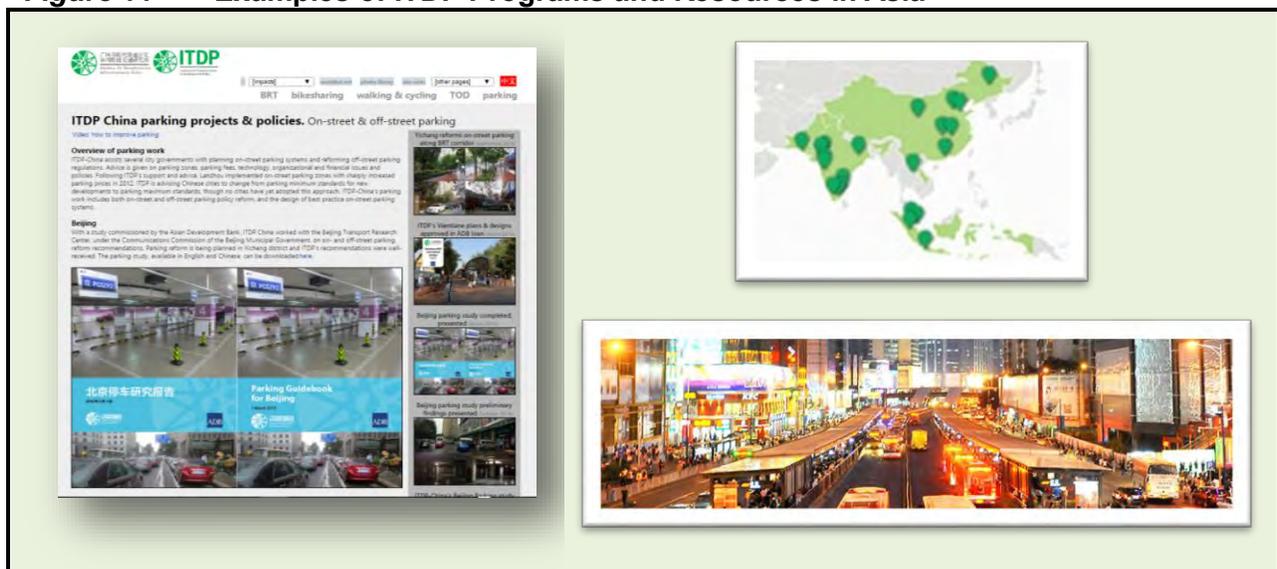


The International Council for Local Environmental Initiatives (ICLEI) provides policy advice and information.

Institute for Transportation and Development Policy

The Institute for Transportation and Development Policy (ITDP) works around the world to support transport policies and planning practices that make cities more livable, equitable, and sustainable. ITDP uses its know-how to influence policy and raise awareness globally of the role sustainable transport plays in tackling greenhouse gas emissions, poverty and social inequality. ITDP has offices around the world, including the people’s Republic of China, India and Indonesia.

Figure 11 Examples of ITDP Programs and Resources in Asia



The Institute for Transportation and Development Policy (ITDP) provides policy advice and information to support sustainable transport planning. Its programs have been very successful in Asia.

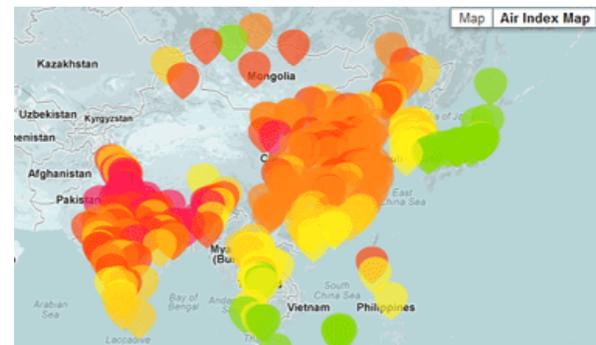
Partnership on Sustainable, Low Carbon Transport

The Partnership on Sustainable, Low Carbon Transport (SLoCaT) promotes the integration of sustainable transport in global policies on sustainable development and climate change. SLoCaT consists of a multi-stakeholder partnership of over 90 organizations, which is supported by the SLoCaT Foundation. It is a multi-stakeholder partnership with more than 90 members. SLoCaT provides coordination among these organizations, and leadership on key issues such as its *Global Transport Intelligence Initiative*, which is working to improve and standardize planning data collection, and efforts to include sustainable transport in world economic development and climate change emission reduction agreements. It is an EST Asia partner.

Asia Regional Organizations

Clean Air Asia

Clean Air Asia is an international non-governmental organization that leads the regional mission for better air quality and healthier, more livable cities in Asia. Its goal is to reduce air pollution and greenhouse gas emissions in 1000+ cities in Asia through policies and programs that cover air quality, transport and industrial emissions and energy use. It works with ministries (energy, environment, health and transport), cities, the private sector and development agencies to provide leadership and technical knowledge on science-based, practical solutions. Its biannual *Better Air Quality Conference*, held since 2002, attracts over 1,000 policy makers, practitioners and industry leaders in achieving cleaner air and more livable cities.



Institute for Global Environmental Strategies

The Institute for Global Environmental Strategies (IGES) was established in March 1998 under an initiative of the Japanese government and the Kanagawa Prefecture based on the *Charter for the Establishment of the Institute for Global Environmental Strategies*. Its goal is to achieve a new paradigm for civilization and conduct innovative policy development and strategic research for environmental measures, reflecting the results of research into political decisions for realizing sustainable development both in the Asia-Pacific region and globally.



South Asia Co-operative Environment Programme

South Asia Co-operative Environment Programme (SACEP) is an inter-governmental organization, established in 1982 by the governments of South Asia to promote and support protection, management and enhancement of the environment in the region.

National and Local Organizations

Center for infrastructure, Sustainable Transportation and Urban Planning

The Center for infrastructure, Sustainable Transportation and Urban Planning (CiSTUP) of Indian Institute of Science, established in 2009, provides sustainable transportation research and training in India and abroad. It is working urban and community planning and mobility issues, including analysis of the causes and consequences of urban sprawl, strategies for more integrated urban land use and transport planning, plus planning and zoning regulation reforms to achieve sustainable development goals.

Centre For Science And Environment (CSE)

The Centre For Science And Environment (CSE) is a network of professionals interested in environmental and sustainable development issues, located in New Delhi, India.

The Korean Transport Institute

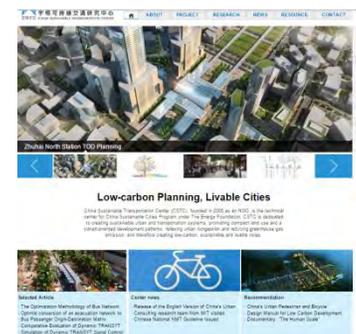
The Korean Transport Institute (KOTI) is an official research agency for the government of the Republic of Korea. Its mission is to provide information and policy guidance for creating optimal transport systems in the Republic of Korea and around the world.

China Urban Transport Research Centre

Established in 2006, with the support of Volvo Research and Educational Foundations, The China Urban Sustainable Transport Research Center (CUSTReC) strives to be a national, regional, and international Center of Excellence for research and development, communication, education and training in future urban transport.

China Sustainable Transportation Center

The *China Sustainable Transportation Center* (CSTC) is the technical center for China Sustainable Cities Program. CSTC is dedicated to creating sustainable urban and transport systems, promoting compact land use and transit-oriented development patterns, relieving urban congestion and reducing greenhouse gas emission, and therefore creating low-carbon, sustainable and livable cities. It supports sustainable city planning, sustainable transportation design, and research on relevant policies in the people's Republic of China.



Beijing Transport Demand Management

TDM in Beijing – Emission Reduction in Urban Transport is a Sino-German project that works to identify and evaluate suitable non-technical measures to reduce vehicle traffic and associated pollution emissions. According to the 2009 action plan and the 2011 development plan, the municipal government intends to implement an ambitious programme of policies and measures. The project partners will focus on innovative, non-technical measures.

Challenges and Recommendations

Although some public and private institutions are leaders in promoting and applying sustainable transportation planning in Asia, others are only starting to understand the concepts. Because transportation affects and is affected by many factors, sustainable transportation planning requires coordination between different jurisdictions, agencies and community organizations. For example, in order to create a high quality public transit network with transit-oriented development it is necessary to coordinate public or private transit service providers, roadway planners, municipal planning agencies, commercial developers, property owners, and neighborhood associations. Such networks often connect multiple municipalities, and so require regional planning and inter-jurisdictional cooperation. Some countries have governance structures that support coordinated planning, but many do not. Where it is lacking, governance reforms, such as the creation of regional planning and financing organizations, may be critical to success.

Most developed countries have well-established professional development programs, including requirements for professionals to regularly upgrade and update their skills (for example, requirements for a certain number of professional development credits each year), and professional organizations that meet regularly to share information and hear speakers. These provide an excellent way to disseminate information and support new ideas related to sustainable transport planning. Many Asian countries could benefit from expanded professional development resources and requirements for planners and engineers.

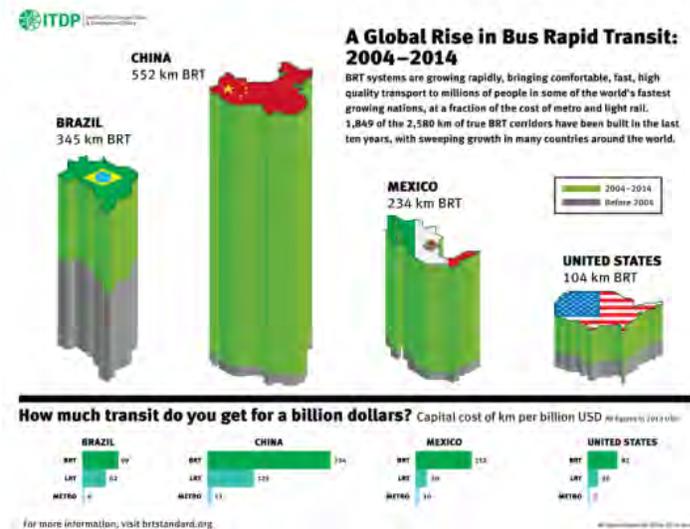
Infrastructure Development

Asian countries are currently engaged in major infrastructure development programs, many of them related to transport, including highways, rail lines, ports and airports. During the last decade, there have been growing efforts to incorporate sustainable transportation concepts into these programs (Venkatachalam 2010). However, there are often major gaps between high level policy shifts and substantial changes in daily practices. Some examples of these changes are examined below.

Bus Rapid Transit In Asian Cities

Bus Rapid Transit (BRT) is a high-quality bus transit system that includes design features which result in fast, frequent, convenient and comfortable service. Compared with roadway expansions and rail transit systems, BRT tends to be very cost effective and quick to develop. During the last decade, the number of BRT systems, and ridership on those systems, has grown rapidly, particularly in Asia. Many EST Forum participants strongly support BRT development, and have used previous Forums to share information about this concept (EMBARQ India 2009 & 2014). It is unlikely that such rapid BRT system growth could have occurred without it.

Figure 12 BRT Systems in Asia (<http://brtdata.org> and ITDP 2014)



During the last decade Asia has embraced BRT. There are now more BRT systems in 41 Asian cities, and more are being developed, due largely to EST Forum members' leadership.

Despite this rapid growth, BRT has only achieved a small portion of its total potential. In smaller, developing cities, BRT can provide higher quality transit service than is currently provided by informal taxis and buses. In larger and more affluent cities, BRT can attract discretionary travelers (people who would otherwise travel by automobile), which helps reduce traffic and parking congestion, accidents and pollution emissions. Even in cities with rail transit services, BRT can provide efficient feeder services and accommodate continued growth. As a result, virtually every city should have an integrated network of high-quality, high-frequency bus routes with dedicated bus lanes.

Improving Active Transport (Walkability and Cycling) Conditions

Although active transport modes (walking and cycling) are common travel modes in Asia, and play important roles in an efficient and equitable transportation system (see box below), they tend to be overlooked and undervalued in conventional transport planning. In the 1980s, the World Bank and other major development agencies were criticized for ignoring these modes (Hook 1994); to its credit, the Bank responded by hiring some of their critics as non-motorized transport policy consultants (Replogle 1992). In recent years, there has been a boom in active transport planning by many agencies and organizations.

Active Transport Roles in An Efficient and Equitable Transport System

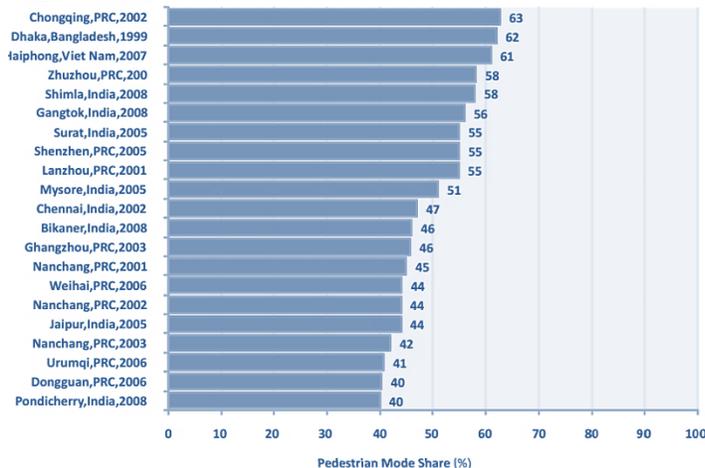
- A major portion of trips are made entirely by active modes, and even trips that involve motorized travel usually include active links. For example, most public transit trips include walking and cycling links and motorists walk between parked cars and their destinations. As a result, walking and cycling improvements can help improve public transit travel, and by expanding the pool of parking spaces that serve destinations, help solve parking problems.
- Active transport improvements can help achieve many planning objectives including reduced traffic and parking congestion, energy consumption and pollution emissions, and help create more compact, Smart Growth urban development.
- Walking and cycling provide affordable, basic transport. Physically, economically and socially disadvantaged people often rely on walking and cycling, so improving active transport can help achieve social equity and economic opportunity objectives.
- Active transport is the most common form of physical exercise. Increasing walking and cycling is often the most practical way to improve public fitness and health.
- Pedestrian environments (sidewalks, paths and hallways) are a major portion of the public realm. Many beneficial activities (socializing, waiting, shopping and eating) occur in pedestrian environments. Residential and commercial districts and resort communities depend on good walkable environments to attract customers.
- Walking and cycling are popular recreational activities. Improving walking and cycling conditions provides enjoyment and health benefits to users and supports related industries including retail, recreation and tourism.

The ADB report, *Walkability and Pedestrian Facilities in Asian Cities: State and Issues*, (Leather, et al 2011), and pedestrian-oriented planning in specific cities (Efroymsen 2012) are examples of these efforts by major infrastructure investment agencies. These studies examine existing walking conditions, identify problems and recommend reforms. The ADB report concludes:

“These actions need the support of key stakeholders, identified to be the national government, city government, civil society, development agencies, and the private sector. The city government is identified as the key stakeholder group for pedestrian facility development and implementation. The national government’s substantial role is in the development of policies catering to pedestrians or building the capacity of city governments’ efforts to develop their own policies.

There is a pressing need to overhaul the existing pedestrian guidelines or develop appropriate guidelines for Asian cities. The available guidelines are often ambiguous or inequitable and rarely enforced in cities. Traffic experts still rely on speed as the basis of performance measurement in urban areas, as found in the United States Highway Capacity Manual. This antiquated view emphasizes the improvement of speed rather than planning for streets that promote accessibility for all users. In practice, many pedestrian level-of-service concepts are based on vehicle travel, in which faster speed indicates efficient flow of foot traffic.”

Figure 13 Pedestrian Mode Share in Asian Cities (Leather, et al. 2010)



Although walking is the most common travel mode in most Asian cities, it often receives little consideration in conventional transport planning. Sustainable transport planning recognizes the important roles that walking plays in an efficient and equitable transport system and so tends to provide far more support for this mode. New planning resources help make this possible.

the people’s Republic of China’s Ministry of Housing and Urban-Rural Development has produced the *Guideline for Urban Pedestrian and Bicycle Transportation System Planning and Design*, the first national- level technical policy document of its kind in the field. The Guideline was developed by China Academy of Urban Planning and Design (CAUPD) and China Sustainable Transportation Center (CSTC), supported by the Energy Foundation China Sustainable Cities Program (CSCP).

Figure 14 Chinese Active Transport Planning Guidelines (CAUPD & CSCP 2014)



The Republic of Korea has made major commitments to active transport (Shin, et al. 2013). For example, the *EcoMobility World Festival* held September 2013 in Suwon, Republic of Korea, showcased an ecomobile urban lifestyle in the neighborhood of Suwon City, which became car-free for the month. The Festival was jointly implemented by the City of Suwon under the leadership of Mayor Yeom, ICLEI and UN-HABITAT.

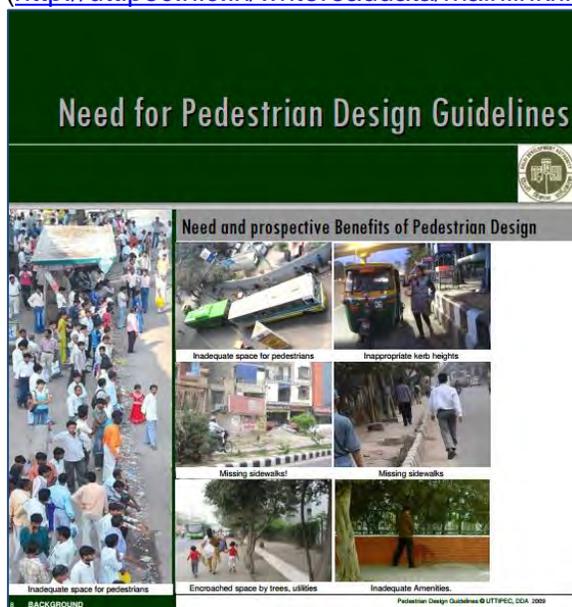
Figure 15 Suwon City EcoMobility World Festival (<http://emwf2013.iclei.org>)



The EcoMobility World Festival held September 2013 in Suwon is one of many policies and programs to promote active transportation in the Republic of Korea. Larger Korean cities are also devoting significant resources to improving and encouraging walking and cycling.

Civic groups in India are working to improve walking and cycling conditions (CSE 2009), and some government agencies including the National Transport Policy Development Committee and the Delhi Development Authority, which published the *Pedestrian Design Guidelines: Don't Drive... Walk*, are institutionalizing more pedestrian-oriented urban transportation planning.

Figure 16 Delhi Pedestrian Design Guidelines (<http://uttipeec.nic.in/writereaddata/mainlinkfile/File215.pdf>)



Design guidelines help institutionalize new concepts and practices, such as this document for improving the accommodation of pedestrians in Indian cities.

Clean Air Asia (CAA 2012) conducted a walkability study in six Indian cities, including three big cities (Chennai, Pune and Bhubaneswar), and three smaller but growing cities (Surat, Rajkot and Indore). The project's objective is to improve the state of walking and pedestrian facilities in Indian cities by policy, strategic documents, regulations and projects development. Based on the study findings it developed specific recommendations for improving walking conditions, and identified various stakeholders who should play a role in developing policies and projects to improve walkability in Indian cities.

Complete Streets refers to roadway design and operating practices intended to safely accommodate diverse users and activities including pedestrians, cyclists, motorists, public transport users, people with disabilities, plus adjacent businesses and residents. Complete Streets planning recognizes that roadways often serve diverse functions including through travel, recreational walking, socializing, vending, and nearby living, which must be considered and balanced in roadway design and management. Complete Streets planning is an effective way to implement more multi-modal planning and encourage more compact development. It is supported by many professional organizations such as the Institute of Transportation Engineers and the American Planning Association, and although Asian transport planners increasingly understand the importance of accommodating diverse modes and users (NTDPC 2012), the term, Complete Streets, is only starting to be recognized in developing countries.

Challenges and Recommendations

One specific challenge is the need for credible modelling tools that can predict the impacts, including greenhouse gas emission reductions, from more sustainable policies and projects in a particular situation (Bongardt, et al. 2011). In some cases, targeted funds and credits are available for strategies that reduce emissions, but only if funders and regulators have confidence that projected benefits will occur.

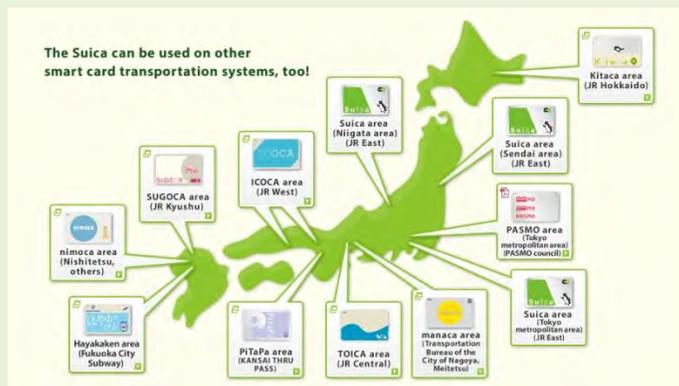
Technologies

Some Asian countries are world leaders in developing and operating state-of-art transportation systems, including sophisticated traffic management and user information, payment technologies, and traffic control systems. Technology implementation is particularly high in Singapore, Japan and the Republic of Korea.

Contactless Transit Fare Payment Systems in Japan and Republic of Korea

(<http://bit.ly/1NFQcVV>), 17 April 2014

More than 90% of the total global value of Near Field Communication (NFC) payment transactions was generated in the Asia Pacific region, particularly in Japan and Republic of Korea. Japan has more than 70 million NFC-enabled devices, compared with approximately 3 million in the US. In December 2010 alone, 9.8 million Japanese consumers used their mobile wallet to make a purchase, including 2.7 million public transport fare purchases using mobile telephones. More than 30 million Suica Cards have been issued, which can be used for transport fare and other purchases.



Republic of Korea's contactless payment market has at its centre the T-money services, which were first implemented in 2004 as a basic transit fare card in Seoul, but evolved into a rechargeable smart card that can be used to purchase public transit fares in all major Korean cities and for other purchases. T-Money 'cards' come in different shapes and sizes ranging from standard credit cards, key chains, charms, watches, rings, stuffed animals, and embedded in mobile phones.



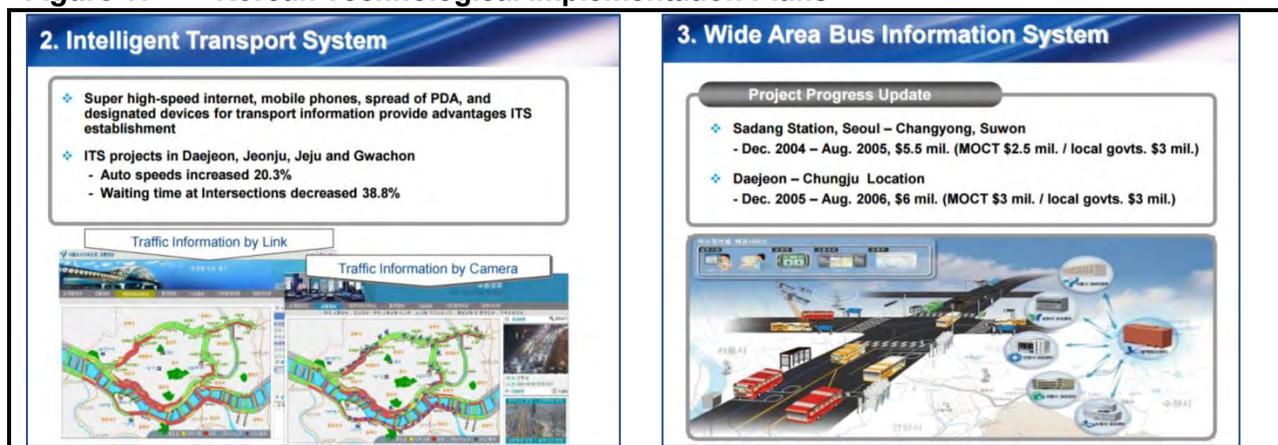
New technologies, including improved logistics, vehicles and terminals, are also important for improving freight transport sustainability (CAA 2015). Freight is the fastest-growing source of transport emissions around the world. Sustainable transport policies tend to focus on personal travel and often overlook freight. Freight transport efficiency can be improved by policies that result in cleaner fuels, higher fuel economy, infrastructure improvements, fleet upgrades and information technology. Clean Air Asia's *Green Freight Website* provides access to information on policies and programs, technologies and logistics, and data relevant to the freight sector, especially for developing countries.

Challenges and Recommendations

Despite major progress in some cities, many Asian cities are still using older technologies and lack implementation plans to deploy better technologies, or are failing to integrate programs so new information or payment systems only function on a portion of the transport network. For example, as automobile ownership increases in a city, it is useful to develop a standard regional platform for parking information and payment systems that includes both municipal and commercial parking facilities. Similarly, as public transit systems evolve from informal taxi and buses services to formalized public bus systems, it is useful to establish a regional platform for transit information and fare payment systems, accessible by Internet and mobile telephones.

Integrated technological implementation requires coordinated planning between public agencies, private companies and users. This can be challenging. Without government leadership, the technological platforms may become fragmented, reducing the quality of service provided to users.

Figure 17 Korean Technological Implementation Plans

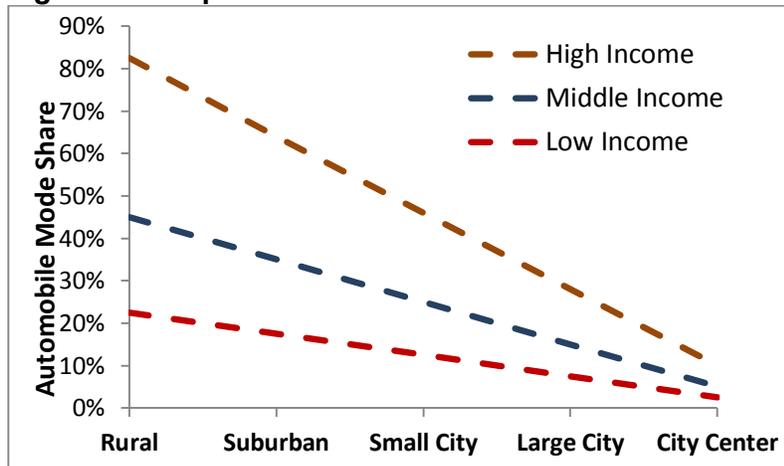


In order to maximize impacts and benefits, technological innovation often requires strategic planning and coordination between various stakeholders.

Transportation Demand Management

Cities are, by definition, places where many people and activities locate close together, so urban space is always scarce and valuable. As a result, efficient and equitable urban transport requires limiting vehicle ownership and use to what city streets can accommodate. Many Asian cities are implementing transportation demand management (TDM) strategies to reduce vehicle travel to what roadways can efficiently accommodate.

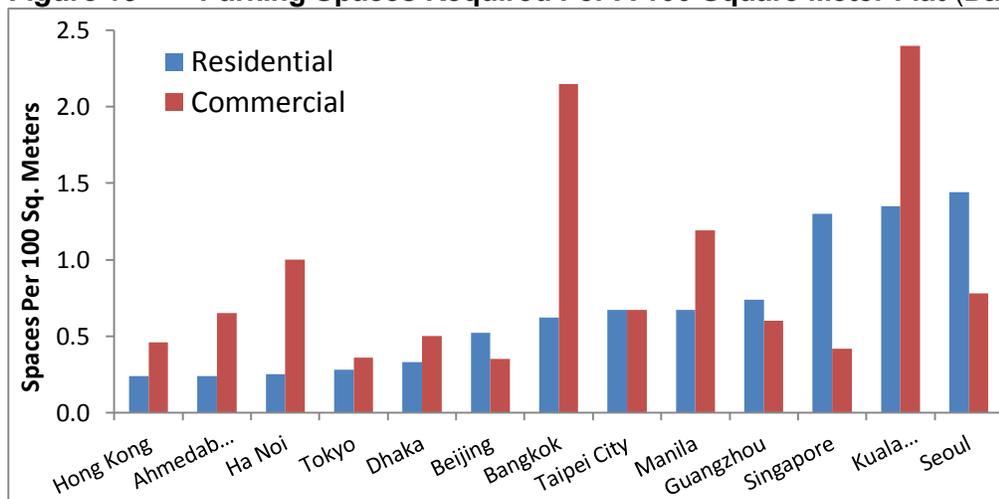
Figure 18 Optimal Automobile Mode Share



As cities become larger and denser, the portion of trips made by automobiles should decline. With an efficient transport system, even wealthy people walk, bicycle and use public transit for a major portion of urban trips.

An important TDM strategy is to reduce or eliminate minimum parking requirements for new developments, and shift to more market-based parking supply, so motorists pay directly for the parking spaces they use. Many Asian cities continue to impose high minimum parking requirements on new developments (Figure 19), but this is changing as sustainable transportation advocates and practitioners become more familiar with more efficient parking management strategies (SUTP 2010; Weinberger, et al. 2013).

Figure 19 Parking Spaces Required For A 100 Square Meter Flat (Barter 2010)



Many Asian cities require large amounts of parking for new developments. Such policies subsidize vehicle ownership and use, and discourage affordable urban infill, which contradicts sustainable transport goals.

Some jurisdictions, most notably Tokyo, require motorists to demonstrate that they have an off-street parking space in order to register a vehicle in that city. This rule reduces on-street parking congestion problems and has reduced per capita private car ownership (Di 2013).

Singapore uses a combination of high vehicle licensing fees and road tolls to control vehicle ownership and use. Hong Kong Special Administrative Region of China does not directly restrict vehicle ownership but has very high parking prices and crowded streets. These policies significantly reduce vehicle ownership and use, even in these affluent and economically successful cities: Singapore has just 10.1 cars per 100 residents, and Hong Kong Special Administrative Region of China has just 6.3 cars per 100 residents (Di 2013).

Singapore Vehicle Control Strategies

New car buyers are required to purchase one of a limited number of *Certificate of Entitlement* (COE) which are auctioned to the highest bidders.

Motorists are charged for driving on major roads using an Electronic Road Pricing (ERP) system. Cars are equipped with an In-Vehicle Unit (IU), which automatically deducts a fee each time the vehicle passes under a gantry.



Singapore uses Electronic Road Pricing (ERP) that charges for driving on major roads during peak periods

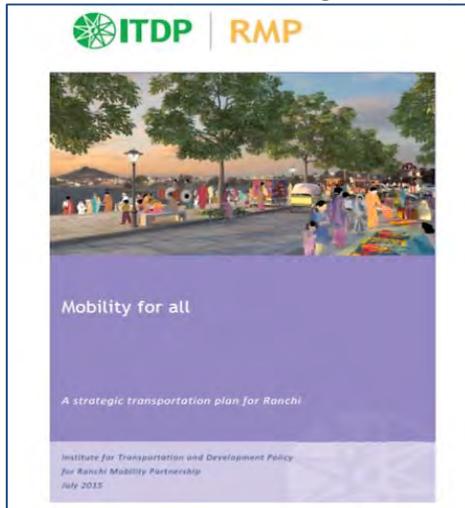
Chinese cities have adopted various programs to restrict private vehicle ownership and use (Suwei and Qiang 2013). Shanghai holds auctions, Beijing uses lotteries, and Guangzhou uses a hybrid of these two mechanisms to allocate vehicle licenses. Since 2008, Beijing prohibits vehicles from driving on public roads one day per week based on their license plate numbers, and since 2009, prohibits vehicles that have not passed emission tests (called “yellow-label”) from driving into the central city. This diversity of strategies provides real world testing of their advantages and disadvantages.

Strategic Transportation Plans

Strategic transport plans are key to assembling the combination of policies and projects for more sustainable transportation in an urban region or city. A good example is the strategic transport plan created for Ranchi, India, the capital of Jharkhand. Ranchi and the other cities of Jharkhand are growing rapidly. The use of personal motor vehicles is expanding rapidly in Ranchi, leading to congestion in central areas and safety challenges. Ranchi current lacks a formalized public transport system; most people rely on walking and paratransit for their day-to-day travel. Until recently, the city’s solution to traffic problems consisted primarily of road widening and flyovers. To develop more equitable, affordable, safe, accessible, and sustainable transport in Ranchi, a variety of civil organizations with diverse interests and backgrounds established the Ranchi Mobility Partnership (RMP). The RMP obtained a grant to fund the Institute for Transportation and Development Policy (ITDP) to lead a comprehensive, multi-

stakeholder strategic planning process which produced the report, *Mobility for All: A Strategic Transportation Plan for Ranchi*.

Figure 20 Ranchi Strategic Transportation Plan (ITDP 2015)



The Ranchi Mobility Partnership obtained a grant to fund the development of a comprehensive, multi-stakeholder strategic planning process for more equitable, affordable, safe, accessible, and sustainable transport in their city.

The process began by developing the *Ranchi Mobility Charter* which outlines the coalition's position on mobility issues. It established the principles that should guide transport planning:

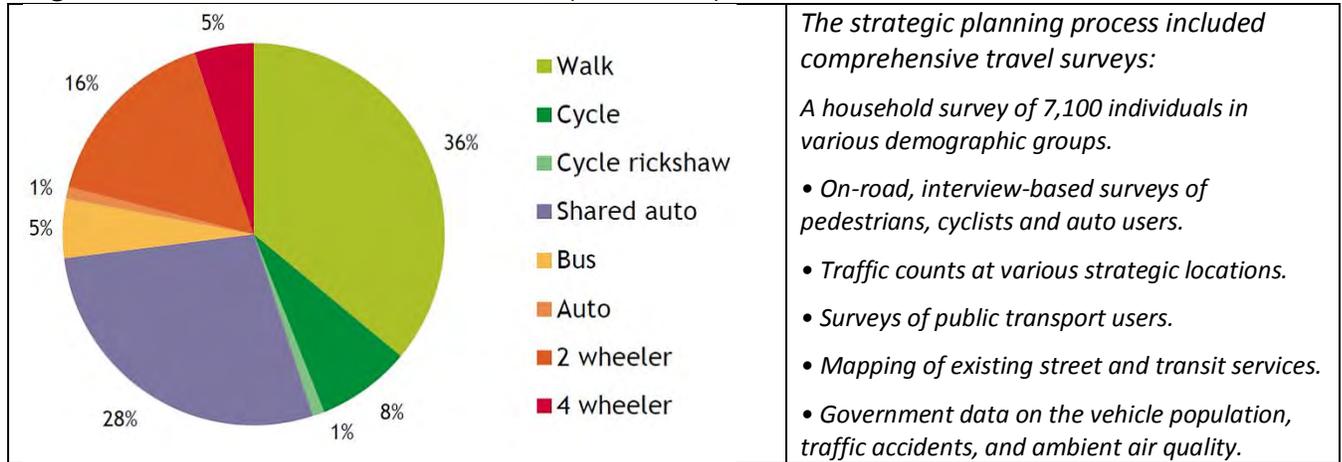
- *Equity*: The needs of all people (including the differently able), regardless of the modes of transport they use, should be the primary criteria in the design of transport systems.
- *Sustainability*: The transport system should consume as few resources as possible; yet provide attractive, comfortable, and convenient service. The resources in this context include urban space, clean air, fossil fuels
- *Liveability*: Urban landscapes should provide ample public spaces for uses like casual recreation, relaxation, social gathering, and managed street-side vending.

RMP's Charter stresses that transport planning should focus on the movement of people, not vehicles, a goal clearly expressed in the National Urban Transport Policy (NUTP), but reflects a major change from traditional traffic and transport studies that emphasize movement of vehicle traffic. In light of these principles, the Mobility Charter calls on the city to carry out a specific set of infrastructure initiatives:

- Improve, expand, and manage a high-quality, bus-based public transport system.
- Develop design guidelines for complete streets that take into account all street users, especially pedestrians, cyclists, and various stationary activities.
- Construct complete streets that allocate street space equitably among all users.
- Develop an effective parking management framework.
- Develop compact, pedestrian friendly neighbourhoods around public transport

The plan is based on standard transport planning practices, expanded to be more comprehensive and multi-modal. For example, the process included a comprehensive travel survey which provided data on the travel patterns of all demographic groups. These planning process also investigated specific concerns and problems, such as special risks that women face traveling, the quality of transit services, vehicle parking problems, and vehicle air pollution. The results provide a foundation for rational transport planning that serves all system users and addresses diverse planning objectives.

Figure 21 Ranchi Mode Share Data (ITDP 2015)



Based on this research, the researchers developed specific recommendations for roadway and public transit service improvements, roadway design and operational changes, parking management, and land use development policies, that reflect international best practices for more efficient and equitable, and therefore more sustainable, urban transportation planning. The study also includes detailed administrative and funding proposals, a five-year implementation plan, and analysis of resulting economic, social and environmental impacts.

Figure 22 Ranchi Street Conditions and Plans (ITDP 2015)

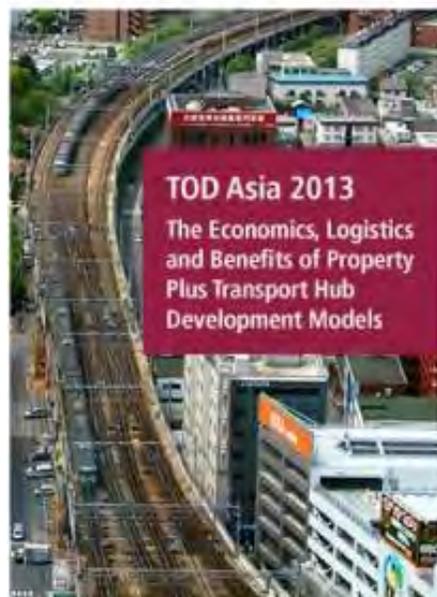


Ranchi strategic transportation plan defines principles, objectives, targets, policy reforms and planning practices for more sustainable transportation in a typical growing Indian city.

Integrated Transport and Land Use Planning

Transportation and land use planning can be integrated in ways that support more sustainable transportation. For example, development policies can support more compact, mixed walkable development, along major transit corridors, in order to maximize transit ridership; this is often called *transit-oriented development* or *Smart Growth*.

Most transportation professionals understand the basic concepts of integrated planning, and a number of good resources are now available to provide guidance, but there are still major problems with implementation (Suzuki, Cervero and Iuchi 2013). For example, many cities restrict development densities, impose minimum parking requirements, or in other ways compact urban infill development (Litman 2014). In other cases, municipal governments encourage greenfield development outside existing urban areas, which isolates residents and increases their transport costs.



Key Challenges and Recommendations

This section discusses some important challenges facing Asian countries as they implement more sustainable transportation.

Urban Livability and Social Equity

The combination of rapid motor vehicle growth, unplanned urban expansion plus limited resources has resulted in many Asian cities lacking quality-of-life features such as safe streets, public parks and playgrounds, attractive streetscapes, and shade trees. In order to create more attractive, livable and equitable cities, Asian urban development policies and planning practices should incorporate the following features:

- Roadways designed to ensure safe and comfortable walking and cycling, with speed control, sidewalks, crosswalks, and bike lanes where appropriate.
- Streets designed with amenities such as shade trees, benches, and garbage cans.
- Parks and recreation facilities within a five-minute walk of most houses.
- A diversity of housing types in each neighborhood, so households can find housing that meets their needs.

Planning Data Quality

Planning, evaluation and research all require high quality data, such as those listed in Table 6. These data must be comprehensive, accurate, consistent, transparent, and available. Sustainable transportation planning requires new data in order to account for more impacts and modes than conventional planning.

Table 6 Examples of Transport-Related Data

Facilities and Services	Activities	Impacts	Land Use
Road and railroad supply and quality	Vehicle ownership (by type and user)	Transport facility and service expenditures	Density and mix
Parking supply and price	Vehicle travel (by type, purpose and location)	Household transport expenditures	Various measures of accessibility
Public transit service supply and quality	Freight transport	Traffic accidents and casualties by mode	Portion of land devoted to transport facilities
Walking and cycling facility supply and quality	Person travel (by mode, purpose and location)	Energy consumption	Land valuation (as impacted by transport facilities and services)
Port and airport size and condition	Mode share	Pollution emissions and exposure	Costs and market values
Transport system connectivity	Non-motorized travel	Traffic and aircraft noise	
Accessibility indicators	Travel speeds and delay (congestion)	Transport quality for disadvantaged groups	

This table lists various types of data needed for transport policy, planning and research.

Currently, quality of transport planning data is highly variable in Asia. Some jurisdictions have excellent data, but others lack basic data, such as motor vehicle ownership and type, roadway quality, and traffic casualties. Even where high quality data are available, they are often incompatible with data collected at other times and places, making it difficult to track and compare changes.

This may be an opportunity to improve transport planning data by establishing Asia-wide standards for basic data collection practices, similar to current efforts to standardize European transport statistics (EuroStat 2014). This effort could be coordinated by international or professional organizations.

Motorcycles and Scooters

One major issue which is particularly significant in Asian cities is the large number of motorcycles and motor scooters. This provides both benefits and costs. Compared with automobile travel, motorcycles are less expensive, require less space for travel and parking, and consume less fuel. However, although motorcycles have less impacts than cars, they still cause traffic and parking congestion, accident casualties and air and noise pollution.

To minimize motorcycle pollution some cities, particularly in the people's Republic of China, have banned fossil fuel motorcycles and scooters. This created demand for electric scooters that are now widely used in those cities and elsewhere around the world. This shift provides large reduction in noise and air pollution, and because electric scooters tend to have lower maximum speeds, they help reduce accident risk.

Banning fossil-fuel motorcycles can be considered a policy intervention that significantly reduced pollution and energy consumption, and helped create a market for more sustainable transportation.

Lessons Learned

A decade of experience with EST Forums in Asia has provided several useful lessons.

Most important, the Forums demonstrate the value of leadership. They show that, given suitable opportunities, diverse countries and organizations can create a common vision for a better future, and assemble the resources needed to make that vision reality.

The Forums also demonstrate that the transport planning paradigm is truly shifting: a growing portion of policy makers, practitioners and the general public understand the value of more comprehensive planning and integrated solutions that address social equity and community livability objectives.

Transport policies have huge economic, social and environmental impacts, they affect virtually every aspect of our lives and our communities. As a result, transportation planning must be comprehensive – it must consider diverse impacts, objectives and options. One size does not fit all!

Asia is rapidly changing. We are right now in the middle of a period of population and economic growth, and urbanization that is unprecedented in history, and once completed will probably never be repeated. Billions of people whose grandparents were peasant farmers living traditional village lifestyles are moving to cities where, for better and worse, their grandchildren will live modern urban lifestyles. These changes affect every aspect of life.

Asia is extremely diverse. The continent contains the world's tallest mountains, some of the largest deserts, many of the largest and most affluent cities, and some of the least developed regions on earth. As a result, the problems communities face, and the solutions they choose, vary tremendously and must be tailored to each situation.

Another important lesson is that stakeholders have diverse priorities and concerns. This is a challenge, but also an opportunity – it means that we can build a broad partnership to support sustainable transport if we can communicate the benefits that potential partners consider important. For example, some people are more concerned about affordability or safety than environmental protection, and so will support sustainable transport policies that help achieve those objectives. Fortunately, many do – our challenge is to identify those win-win solutions and effectively communicate their value to targeted audiences.

One of the most dramatic changes over the last decade is the growth and increasing sophistication of international, regional and national sustainable transportation research and advocacy organizations. These organizations produce high quality reports, fact sheets, websites, videos and software programs. Some of these are being translated into multiple languages and tailored to specific audiences. Such organizations are important EST Forum partners and make important contributions to positive change.

Some additional lessons learned are summarized below:

What went right?

- The Forums have helped improve our understanding sustainable transport concepts. Policy makers, practitioners and the general public seem to increasingly support many sustainable transport concepts, such as improved walking, cycling and public transit.
- The Forums have helped governments establish clear goals and measurable targets, and through the country and city reports, track progress toward achieving those goals. This is an effective way to focus attention and stimulate progress on these issues.
- The Forums have contributed to more multi-modalism planning. Many transportation agencies and professional organizations are changing their policies, investments and planning practices to give more consideration to non-auto modes. This has significantly increased support for active transport (walking and cycling). Many jurisdictions are developing walking and cycling plans, and services such as bikesharing.
- Many cities have implemented, or are in the process of deploying, technologies that improve traffic and public transit operations, and facilitate payments for public transit fares, parking fees and road tolls. In many countries, most residents have access to digital information technologies, such as mobile telephones and the Internet, which can make travel more convenient and safer.
- Fuel subsidies are declining, and a few cities are implementing parking pricing reforms.

What went wrong?

- There are still frequent conflicts between the transportation policies of different agencies and jurisdictions, such as municipal minimum parking requirements that encourage driving in areas that are trying to encourage travel by alternative modes.
- Although most people agree on the importance of social equity objectives (such as ensuring basic mobility for physically and economically disadvantaged people, increasing affordability, and reducing traffic risks to vulnerable users), these are often treated as special issues rather than being incorporated into day-to-day planning decisions.
- There has been little progress with pricing reforms. More efficient road tolls and parking pricing often face severe political opposition. Road and parking pricing are sometimes implemented to generate revenue, but seldom as demand management strategies.
- In some countries there is no system for on-going professional development by transport planners and engineers, so many practitioners continue to use outdated methods.
- Many cities have poor land development policies. They fail to effectively guide development, resulting in either too few housing options or too much sprawl.
- Some new public bus systems, including some BRT systems, have failed to achieve their ridership and revenue targets.
- New technologies are sometime difficult and costly to implement. As a result, many areas still lack integrated public transit information and payment systems.
- Many cities lack effective traffic and parking regulation enforcement, and driver training.

Have Asian countries and cities been successful in addressing social equity objectives?

- In many Asian communities, physically and economically disadvantaged people endure very poor travel conditions due to a combination of inadequate facilities (sidewalks and paths), inadequate or expensive public transit services, and rapid increases in automobile traffic. In some cities, conditions are getting worse, rather than better, due to increased vehicle traffic speeds and volumes, and parking on walkways, which make walking on roadways infeasible.
- In many cities, most lower-priced housing is located at the urban fringe, leaving low-income households isolated. In a modern, industrialized economy, providing affordable housing within convenient walking distance of urban jobs and services is an important way to improve disadvantaged people's economic opportunities.
- There is evidence that women are frequently harassed while walking, cycling and using public transport. Although some agencies are trying to address these problems, progress is slow.

What are critical EST areas for Asian countries over the post-2015 development era?

- Many countries need to better coordinate the policies of different ministries, agencies and jurisdictions to allow more integrated transportation policies and planning practices. For example, transportation, environment and health agencies should coordinate their efforts to encourage shifts from private automobile travel to more efficient, less polluting and healthier travel modes, and transport and housing ministries should integrate development policies to create more compact, multi-modal cities.
- Governments need to develop better funding options. Federal governments can establish optional taxes that municipal governments can use to support sustainable transport, such as high quality public transit, and walking and cycling facility improvements.
- Practitioners (analysts, planners and engineers) need better tools for evaluating the full costs of business-as-usual, and the full benefits of sustainable transport policies and projects. We need better models for predicting how specific transport system and land use development changes will affect travel activity (how and how much people travel), and tools for quantifying the resulting economic, social and environmental impacts.
- Sustainable transport advocates need better resources for responding to common criticisms and political attacks on sustainable transport policies and programs. For example, we need information and community advocacy that can counter motorists' opposition to bus- and bike-lanes, and efficient parking pricing.
- Governments, advocacy organizations, and universities can promote a culture of innovation that encourages public officials and practitioners to implement pilot projects to test new ideas, with a plan identifies how it can be scaled up if the concept proves to be successful.
- We need better data for planning, evaluation and research purposes. The EST Forum can provide a platform to develop global or regional standards and best practices for planning data collection.
- To help public officials and practitioners understand the problems that people with disabilities face while traveling, they should spend a few days traveling their city in a wheelchair.

The Way Forward

This analysis indicates that the EST Forums in Asia are overall very effective and beneficial. As a result, the best way forward is to continue these events, and expand their influence in response to future demands.

This analysis suggests that the need for more sustainable transportation policies will increase, due to population and economic growth, urbanization, and growing environmental concerns, all of which increase the value of more efficient and equitable transport systems. Many sustainable transport concepts have completed their testing stage and have proven their value. We have good knowledge about how and where these strategies should be applied, and are now in the promotion and growing application stages. This suggests that the EST Forums should help scaling up implementation programs.

Although the EST Forums have proven very effective at building leadership at the national level, and in some cities, these only directly affect a small portion of the decision-makers who affect transportation policies and planning practices. For this reason, it may be time for EST Forums in Asia to support the development of numerous smaller-scale events with similar goals and methods, at the national, regional and local levels. These Forums can involve a similar set of policy makers and their advisors, practitioners, advocacy groups, and experts who can work together for more sustainable transport policies in their communities. Several examples exist, including the *Urban Mobility India* (www.urbanmobilityindia.in) conference held annually in New Delhi, and regional conferences and workshops sponsored by planning and engineering professional organizations.

One possible adjustment to the Forums would be to change the name from *Environmentally Sustainable Transportation Forums* to *Sustainable Transportation Forums*, or *Sustainable Development Forums*, in recognition that sustainability requires considering social and economic, as well as environmental goals – it's about *balance*. This reflects our evolving understanding of the meaning of *sustainability*, and may help build partnerships with organizations that have other priorities besides environmental protection.

Conclusions

Wow, a lot can happen in a decade!

Asian countries are experiencing growth and urbanization at a scale that is unprecedented in human history. As a result, many Asian cities are facing severe problems including congestion and pollution problems, rising inequity, and declining quality of life. Climate change, and associated threats such as sea level rise and extreme weather events, have become more apparent. These problems have become clearer and demand for action is increasing.

Fortunately, sustainable transportation advocates have swung into action, in part, through EST Forums. A review of Forum activities and outputs indicates that these international conferences are a powerful catalyst for more sustainable transport. These Forums have large leverage effects. They have helped change the way public officials and practitioners think about and solve transport problems, and helped forge alliances between diverse jurisdictions and interest groups. Many of the ideas and recommendations presented at the EST Forums are now being widely adopted throughout Asia. Although it is difficult to measure the full extent of these impacts, they are probably very large.

Figure 24 EST Forum Leverage Effects

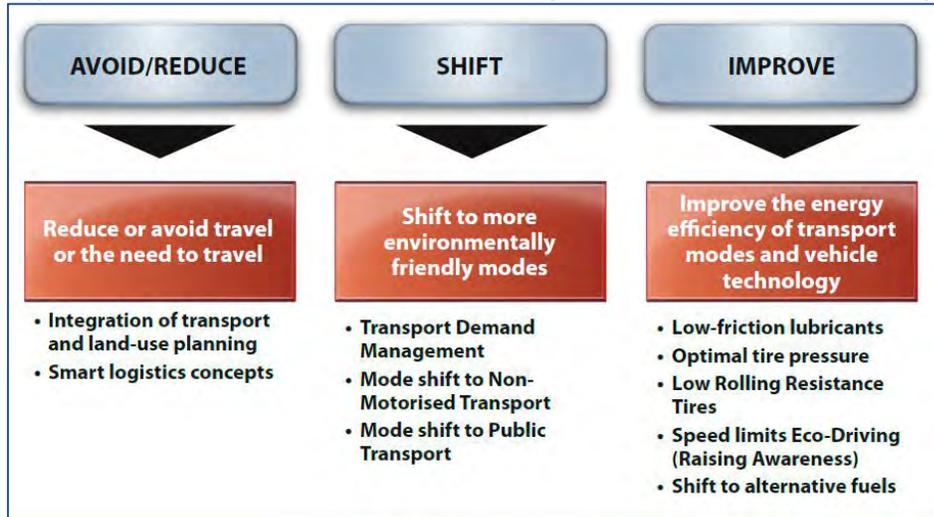


The EST Forums influence federal policies, which result in more sustainable transport planning, which leads to improved walking, cycling and public transit conditions, plus other TDM strategies, which result in better economic, social and environmental outcomes. These impacts can be large and durable.

During this decade, our understanding of sustainable transport issues has improved significantly. The EST Forums originally focused on local and global air pollution, but it quickly became evident that *everything is connected*, and more comprehensive solutions can help build broader support for change. For example, we prefer the *win-win* emission reduction strategies which also help reduce traffic congestion and improve mobility options for physically, economically and socially disadvantaged people. These are true sustainable transportation strategies, because they balance economic, social and environmental goals.

Many win-win solutions exist. They include policies that improve resource-efficient modes, such as walking, cycling and public transit; incentives for travelers to choose the most efficient mode for each trip; and more compact and multi-modal urban development which reduces the distances that people must travel to reach destinations. These reflect the concept of *Avoid-Shift-Improve*, which provide a framework for prioritizing solutions to maximize total benefits.

Figure 25 **Avoid-Shift-Improve** (Bongardt, Breithaupt and Creutzig 2011)



Avoid-Shift-Improve is a recipe for maximizing sustainable transport benefits.

During the last decade, many of these strategies have been tested and proven their value, and we have developed good understandings of where and how they should be implemented to maximize their benefits. This means that we are now entering the promotion and adoption stage during which these concepts will be widely implemented. It is time to scale up!

Table 26 **Where We Want To Be**

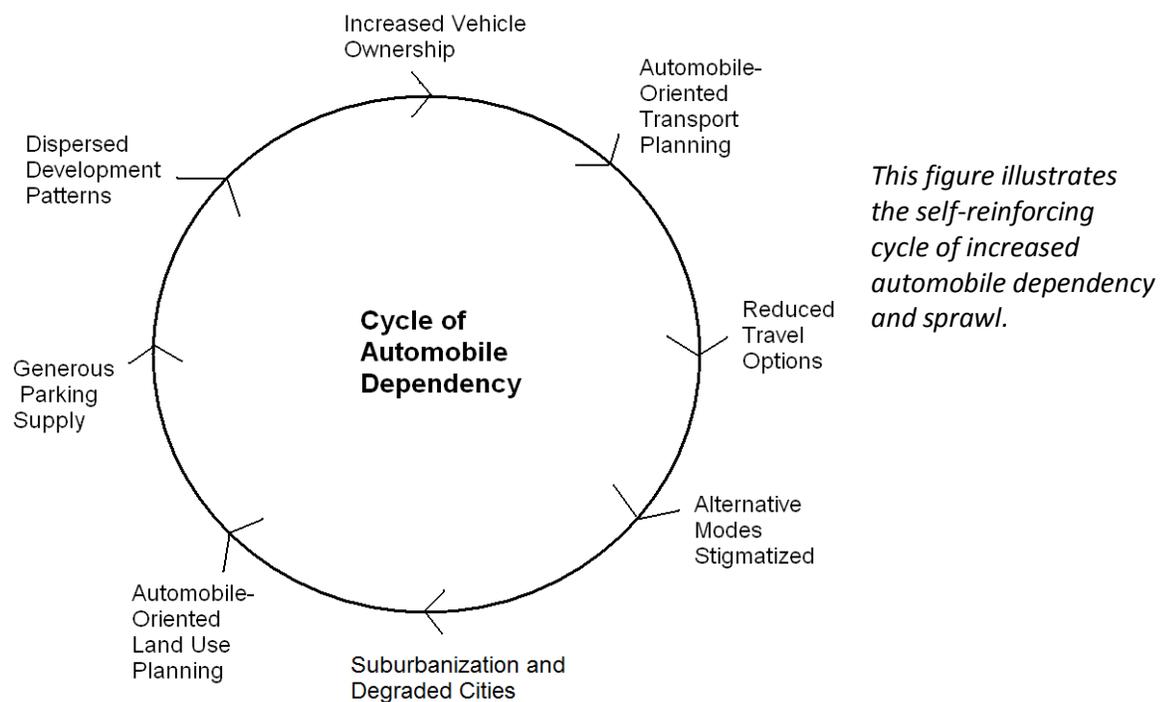


Sustainable transportation innovations are likely to follow a predictable growth pattern. Many strategies are currently in the “understanding” and “promotion” phases, and are starting into a “rapid adoption” phase. We should prepare to scale up to meet growing demands for smart solutions.

This requires leadership: people and organizations that will work to create a shared vision and create the resources needed to make that vision reality. Who will provide this leadership? We will! The public officials, practitioners, advocates and researchers who participate and support the EST Forums are the natural leaders for creating more sustainable transportation in Asia.

We face significant challenges. Many Asian countries continue policies and planning practices that reflect the old, mobility-based paradigm which favors automobile travel over more resource efficient modes, and supports sprawled urban development. These include dedicated highway funding, roadways designed to maximize vehicle traffic speed, inadequate walking and cycling facilities, restrictions on urban infill densities, and minimum parking requirements in zoning codes that essentially subsidize automobile ownership and use. These policies create a self-reinforcing cycle of automobile-dependency and sprawl.

Figure 27 Cycle of Automobile Dependency and Sprawl



Creating more sustainable transport systems requires more than just good ideas; it requires changing the paradigm people use to define transport problems and evaluate potential solutions, and more comprehensive and integrated planning. This means, for example, that we recognize the important roles that walking, cycling and public transit can play in an efficient and equitable transportation system, and so make significant investments in these modes.

Critical sustainable transportation strategies such as road tolls, parking fees and bus-lanes sometimes face significant political opposition by people and groups who only perceive their costs and ignore their numerous benefits. Sustainable transportation can provide many diverse benefits, including some that are outside the traditional scope of transport planning, such as

increased affordability, improved public fitness and health, and local economic development. We need to do a better job of communicating these benefits. For example, we can do a better at communicating the full benefits of bus-lanes including benefits to people who do not use that mode, such as reduced congestion for motorists and reduced parking costs to businesses.

Similarly, many sustainable transport planning strategies help achieve social equity objectives. For example, walking, cycling and public transit facility improvements ensure that non-drivers receive a fair share of public resources (road rights of way and public investments) devoted to transportation, which reflects horizontal equity, and they benefits physically, economically and socially disadvantaged people, which reflects vertical equity. Many people understand this intuitively, but advocates need better tools for communicating and quantifying these impacts.

We need better tools for quantifying the economic development benefits of more resource-efficient transport. Many Asian countries import vehicles and fuel, so policies that reduce motor vehicle ownership and use, and so reduce expenditures on imported goods, increasing economic productivity. Sustainable transport policies can also increase productivity by expanding employment opportunities and reducing road and parking facility costs.

As sustainable transportation planning scales up, it will be important to educate and inspire a much larger number of practitioners – the planners, engineers, designers, technicians and law enforcement officials who make many of the decisions that affect transport conditions and activities. Although Asia has many high-level conferences and related events, there is a need for regional and local professional development programs, such as lectures, one-day workshops, webinars and training courses organized by professional organizations and universities. It should become normal for practitioners to attend one or two professional development programs each year. This will be an effective framework for disseminating information on sustainable transportation concepts.

Management experts often emphasize that what gets measured gets managed. Improving data collection is an important issue for policy makers and analysts. The EST Forums already collect some data through country and city reports; it may be useful to expand this to include a standardized set of statistics, or support for an international transport data improvement program, similar to the global Transport Intelligence Initiative.

The EST Forums in Asia demonstrate the value of leadership. During the last decade they helped create a shared vision and assemble the resources needed to create more efficient and equitable transport systems. Since the first EST Forum in 2005, many sustainable transport concepts identified in these forums have been tested and proven. We now know that more integrated and multi-modal planning, efficient transport pricing, walking and cycling improvements, and Bus Rapid Transit can succeed. It is now time to scale up implementation of these concepts in order to achieve their full potential.

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