

Staff Working Paper
May 2010

SUSTAINABLE TRANSPORT INITIATIVE

Operational Plan



Asian Development Bank



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Abbreviations

ADB	–	Asian Development Bank
CO ₂	–	carbon dioxide
DMC	–	developing member country
GDP	–	gross domestic product
IED	–	Independent Evaluation Department
ITS	–	intelligent transport system
NGO	–	nongovernment organization
OECD	–	Organisation for Co-operation and Development
PPP	–	public–private partnership
PRC	–	People’s Republic of China
PSOD	–	Private Sector Operations Department
STPF	–	Sustainable Transport Partnership Facility
STI	–	Sustainable Transport Initiative
TCOP	–	Transport Community of Practice

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Introduction and Background

Aligning ADB's Transport Operations with Strategy 2020

Through Strategy 2020,¹ the Asian Development Bank (ADB) has established three strategic agendas to guide its work up to 2020—inclusive economic growth, environmentally sustainable growth, and regional integration (Appendix 1). The need for better transport is common to each of these agendas. Transport will be a major part of future ADB operations in infrastructure—one of its five core areas of operational focus. Transport is also integral to the five drivers of change of Strategy 2020—private sector development and private sector operations, good governance and capacity development, gender equity, knowledge solutions, and partnerships.

In implementing Strategy 2020, ADB needs to adapt its transport operations to the changing context of transport in its developing member countries (DMCs) in Asia and the Pacific. Various factors—including economic growth, rising incomes, growth and aging of populations, trade, and urbanization—have led to changes in the types of transport support that DMCs require. Many DMCs have strengthened the capacity of their transport institutions, and their requirements for ADB support have become more sophisticated. Also, it has become clear that, alongside its beneficial contributions, transport can have negative side effects, and these need to be carefully avoided or mitigated. Some of these effects—e.g., congestion, damage to the local environment, and traffic accidents—are localized, while others, including carbon dioxide (CO₂) emissions, can cause problems of global significance. Across the various aspects of ADB's transport operations that now need to be updated, the overarching theme is that ADB should assist DMCs to develop transport that is more sustainable—economically, socially, and environmentally.

ADB has established the Sustainable Transport Initiative (STI) to align its transport operations with Strategy 2020 and provide technical and other resources to build a portfolio of enhanced lending and technical assistance to support sustainable transport. The STI is being implemented under the guidance of ADB's Transport Community of Practice (TCOP). Preliminary work on the STI was conducted in 2008–2009. This included research on aspects of sustainable transport that were relatively new to ADB, and the introduction of additional operational support for sustainable transport in DMCs on a pilot basis. ADB also began to establish partnerships with development partners and centers of excellence to strengthen collaboration and knowledge sharing on sustainable transport.² The TCOP built consensus for the STI through a series of consultations among ADB transport professionals, obtained advice and support from regional departments, and sought guidance from ADB Management. Feedback was also received from DMCs and the

¹ ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank 2008–2020*. Manila.

² These include memorandums of understanding with the Korea Transport Institute and the Inter-American Development Bank, and a letter of agreement with the Clean Air Initiative for Asian Cities Center. ADB is an active part of the Global Road Safety Partnership. ADB is currently leading the Partnership on Sustainable Low Carbon Transport, the largest multistakeholder initiative on sustainable low-carbon transport.

international transport community.³ Drawing upon the outcomes of this preliminary work, this report presents the operational plan for subsequent phases of the STI for 2010–2020.

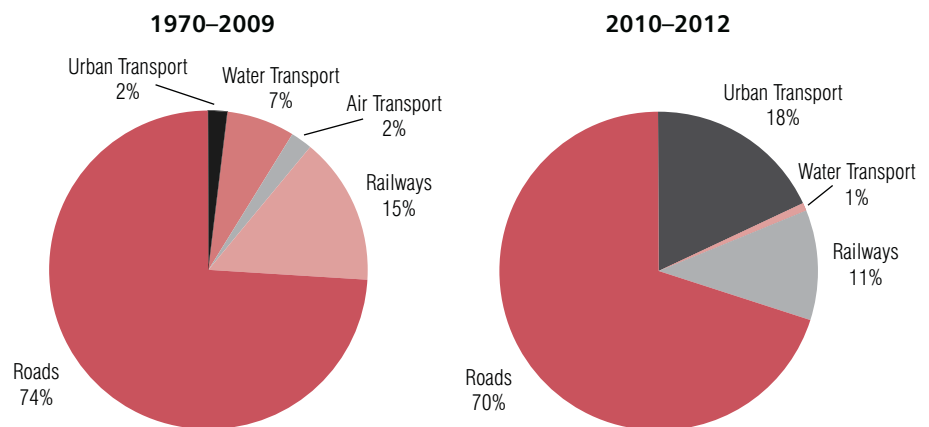
The STI operational plan is a tool to help ADB adapt its transport operations to serve the changing transport needs of DMCs. The plan seeks to build upon the strengths of ADB’s existing transport operations, while introducing effective models of support for new and emerging fields of sustainable transport. The operational plan is results-based with measurable, monitorable targets, and includes details of required human and financial resources and institutional coordination arrangements. By embracing all parts of the ADB transport community, it invites interdepartmental and interdisciplinary approaches, and sends a signal that fresh ideas in transport are welcome in ADB. Looking beyond ADB, the plan offers a starting point for strengthening partnerships in transport. ADB’s updated focus can energize its partnerships with DMCs to work together on addressing critical transport issues. It also creates a basis for development partners and centers of excellence to join ADB as partners in the STI.

Past ADB Transport Operations

Transport is one of the main sectors that ADB supports—a reflection of the important role that transport plays in enabling economic development and poverty reduction. Transport has accounted for 21% of ADB lending since it was established in 1966, and 27% during 2005–2009.⁴ Within the 2010–2012 lending pipeline, projected transport lending is \$3.4 billion per year.

Most ADB transport lending has been for roads and, to a lesser extent, railways (Figure 1). ADB has an established competence for supporting roads, including in the fields of infrastructure development (national and international highways, rural roads); institutions (asset management, road funds, tolling, corporatization); services (logistics, trade); and social dimensions. In

Figure 1: Transport Lending (Public Sector)



³ Useful feedback was obtained at the ADB Transport Forum: Asia on the Move: Energy Efficient and Inclusive Transport, held at ADB headquarters in September 2008.

⁴ This does not include support for urban transport or road improvements that were part of agriculture projects or transport operations of the Private Sector Operations Department.

railways, ADB has a smaller core expertise covering infrastructure development and some aspects of railway policy and institutions. Historically, ADB has also supported ports and civil aviation through its public sector lending operations, but this support declined in the 1990s when private capital became more readily available in these subsectors. ADB has had limited involvement in urban transport, but lending is likely to grow due to demand from DMCs. The pipeline for 2010–2012 shows that urban transport forms 18% of the total lending pipeline.

According to the Independent Evaluation Department (IED), ADB transport projects have generally performed well. During 1970–2005, 83% of transport operations were rated *successful* or better, rising to 91.7% in 2000–2005. The proportion was higher for roads (90%) than for other modes (75%). Transport projects consistently outperformed projects in other sectors—only 53.7% of projects from other sectors were rated *successful* or better.

In recent years ADB transport lending has gradually increased; there were 18 projects for \$2.2 billion in 2004, rising to 22 projects for \$2.3 billion in 2009.

Conceptual Framework for Sustainable Transport

The approach to transport in Asia and the Pacific is being affected by changes in the way that development is conceptualized and advanced. It is now widely accepted that development is about much more than economic advancement, and that more attention should be given to understanding its multiple effects on human life and the natural and physical environment. In this way the beneficial effects of development can be harnessed and adverse effects avoided or minimized.

Strategy 2020 seeks to align ADB's operations with these changes in development thinking. The overall focus is on helping DMCs establish a sustainable pattern of development, one that will enable all people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations. Nowhere is the concept of sustainability more relevant than in the transport sector. Transport is an integral part of most of the activities, goods, and services required for supporting and improving people's lives, yet it also consumes resources and has adverse side effects. A balance has to be found that will enable people's transport needs to be met in a way that neither harms nor depletes.

It is appropriate that ADB should adopt **sustainable transport** as the guiding principle for aligning its transport operations with Strategy 2020. While various definitions are possible, a sustainable transport system may generally be considered to be one that allows the basic access and development needs of individuals, companies, and society to be met safely and in a manner consistent with human health. Sustainable transport supports a competitive economy and balanced regional development, and promotes equity, including gender equity, within and between successive generations. Environmentally, a sustainable transport system minimizes the use of land and emissions, waste, and noise. It uses renewable resources at or below their rates of generation, uses nonrenewable resources at or below the rates of development of renewable substitutes, and limits emissions and waste within the planet's ability to absorb them. In terms of cost, a sustainable transport system is one that is affordable and operates efficiently, taking into account requirements for investment in capacity and the need for maintenance.

Based on these considerations the STI defines a sustainable transport system as one that is **accessible, safe, environment-friendly, and affordable**.⁵ This incorporates multiple overlapping dimensions of sustainability (Table 1).

⁵ Except for explicitly mentioning safety, this is similar to the definition given by the European Conference of Ministers of Transport (ECMT). ECMT. 2004. *Assessment and Decision Making for Sustainable Transport*. ECMT, Organisation of Economic Co-operation and Development (www.oecd.org).

Table 1: Dimensions within the Definition of a Sustainable Transport System

Dimension of Sustainability	Definition of a Sustainable Transport System			
	Accessible	Safe	Environment-friendly	Affordable
Economic and financial	◆			◆
Asset condition	◆	◆	◆	◆
Social equity	◆	◆	◆	◆
Health		◆	◆	
Ecology			◆	
Physical environment		◆	◆	
Air quality and noise		◆	◆	
Climate		◆	◆	

Source: ADB.

Sustainable Transport Needs and Challenges

Despite advances during recent decades, DMCs still have enormous needs for accessible, safe, environment-friendly, and affordable transport. Their needs have increased as a result of population growth and the economic growth facilitated by past transport development.⁶ DMCs also need to adapt and improve upon the type of transport provided for this to be sustainable, and address new and emerging transport needs and challenges.

Continuing Needs and Challenges

Infrastructure gap. A recent study by the ADB Institute found that, in spite of considerable investment, transport improvements have not kept pace with the growth in demand, and that transport consequently remains a critical development bottleneck. There are gaps in every transport subsector, at each level of the transport network, and in terms of accessibility, geographical coverage, and interconnectivity between transport modes, particularly in poor regions. In the years ahead, the demand for freight and passenger transport will continue to grow faster than gross domestic product (GDP). In the next decade the countries of Asia and the Pacific will need to invest \$8 trillion in infrastructure, with much of this being for transport.⁷

Given the enormous financing requirements, DMCs will continue to need support from ADB and other development partners to mobilize financing for transport infrastructure. The nature and extent of this support will vary depending on a country's size, capacity, and access to capital markets. Some small, low-income countries may continue to depend on ADB and other development partners to finance much of their transport investment requirements and to support capacity development. However, for the region as a whole, financing from ADB will only cover a small portion of total transport investment requirements. For this reason, ADB transport operations will need to give much greater emphasis to leveraging additional financing from other sources, in particular by acting as a catalyst, to bring about a much higher level of private sector participation in transport. ADB will also need to add value to the investments through enhanced knowledge support to the DMCs on strategic issues and in specialized fields of transport.

Roads. ADB transport lending has focused mainly on the road subsector (Figure 1). This period has seen road networks and the capacity of existing roads in many DMCs significantly expand, and the proportion of paved roads increase. ADB has financed roads in most DMCs, at all levels of the network. During 2005–2008, ADB projects provided 1,400 kilometers (km) of

⁶ In the 1980s and 1990s, real per capita gross domestic product (GDP) rose more than 6% annually in East Asia and 3% annually in South Asia. GDP growth in Asia and the Pacific has accelerated again since the Asian financial crisis; from 1999 to 2006 it averaged 6% per year. Annual growth in vehicle ownership was even higher—10% in India, Malaysia, and Sri Lanka, and close to 20% in the People's Republic of China (PRC).

⁷ ADB–ADB Institute. 2009. *Infrastructure for a Seamless Asia*. Tokyo.

expressways and 39,100 km of national highways and provincial, district, and rural roads, benefiting an estimated 422 million people.⁸ With road traffic growing faster than GDP in most DMCs, there will be large continuing needs for road construction and improvement in the years ahead, and ADB assistance for roads will remain important.

Construction of expressways and national highways has reduced transport costs and journey times, and thereby enabled economic growth. ADB support has helped assure project quality and financial sustainability, introduce improved construction technologies and features such as tolling, and strengthen safeguards against adverse social and environmental impacts. Alongside its support for investments, ADB has provided assistance to strengthen the capacity of road institutions. With varying degrees of success, it has helped governments with the difficult process of modernizing and streamlining their policy and institutional arrangements for roads, including through reengineering, commercialization, outsourcing, and privatization.

Road improvements at lower levels of the network have played a key role in improving people's access to economic opportunities and services. In most DMCs, the incidence of poverty is highest in rural areas. Often this is linked to geographical remoteness and lack of access to markets and services. In line with its overarching poverty reduction strategy, ADB has supported integrated road network improvements in many DMCs and financed major rural roads programs. Between 1996 and 2009, ADB provided \$4 billion for rural roads, including large programs in India, Indonesia, Pakistan, and Viet Nam. ADB has also provided support for strengthening institutional arrangements and capacity for jurisdiction over rural road networks, project management, and financing and execution of rural road maintenance. To help realize the full potential for rural roads to contribute to more accessible and affordable transport, ADB has also supported improved rural bus services to ensure adequate services, encourage competitive transport markets, strengthen approaches to service regulation, and finance facilities such as bus stations. Rural transport will continue to be an important focus for ADB transport operations.

For road investments to be sustainable, the road assets need to be maintained throughout their intended economic life; otherwise the initial gains in improved accessibility, affordability, and safety will gradually be lost. As a general rule, for every \$1 of essential maintenance that is postponed, the operating costs of vehicles increase by more than \$3.⁹ In many DMCs there continue to be significant shortcomings in the way that road infrastructure is maintained. DMC governments have often emphasized new construction over road maintenance, with the result that maintenance backlogs have built up. Some DMCs have also lacked the necessary policies, institutional arrangements, and capacity for maintenance.

A sustainable approach to maintenance has three pillars: an objective approach to selection of maintenance works, effective execution of works, and adequate financing. For roads carrying large traffic volumes, ADB has helped create self-supporting road agencies (and sometimes public-private partnership [PPP] concessions). These agencies finance road construction and operation from toll revenue, and have adequate technical capability for undertaking maintenance programming and recruiting capable maintenance contractors. For other parts of the road network, ADB has helped establish road asset management systems, strengthen road maintenance agencies, introduce maintenance contracting and performance-based contracts, and raise the level of maintenance budgets. It has also helped some DMCs establish road funds to provide a more reliable source of financing for road maintenance—such as from fuel taxes, vehicle fees, or taxes—and to improve accountability to the public. To support sustainability

⁸ ADB. 2009. *Development Effectiveness Review 2008*. Manila.

⁹ ADB. 2003. *Road Funds and Road Maintenance—An Asian Perspective*. Manila.

in the roads subsector, ADB should continue to include road asset management in its road subsector policy dialogue and operational support, and assist DMCs to address accumulated road maintenance backlogs.

Railways. In contrast with the universal growth of road transport, rail transport in much of developing Asia has experienced declining market share, with expansion and growth confined to a small number of DMCs. The major exception is the People's Republic of China (PRC), which has steadily expanded its railways and reformed its railway institutions. This included a 60% increase in route-kilometers since 1980, with a 17,000 km high-speed passenger network under construction. On a lesser scale, India has invested substantially in expanding its network and initiating reforms. Several other DMCs have also invested in new lines, but most of the region's railways have seen only very modest development and reform. The experience of the PRC has demonstrated that, depending on traffic, geography, and other factors, modern railways can play a major role in enabling inclusive economic growth, and can have positive effects on poverty levels in hinterland areas. It has also shown that railways are an important mode for sustainable transport, as they offer significant safety advantages and have lower environmental impacts and emissions. The experience of other DMCs also shows that many railway administrations have struggled to adapt to rapidly changing market circumstances, and have found it difficult to reform and modernize.

Past ADB support for railways has been mainly confined to Bangladesh, the PRC, India, and Uzbekistan (new lending is also under consideration for Cambodia, Mongolia, and Turkmenistan). During 2005–2008, ADB projects provided 3,200 km of railway lines (footnote 8). These were mostly new lines in the PRC, which also account for two-thirds of the 2010–2012 railways lending pipeline. The major factor that has limited the scale of lending for railways is the reluctance of railway administration bodies to reform and modernize. This has made it difficult to justify large new investments. Another constraint is that it has not been possible to realize the full potential of railways for long-distance transport because of restrictions in cross-border movements as well as gauge differences between countries. In several DMCs there appear to be signs of a new willingness to embrace railway reform and modernization. There may also be prospects for regional cooperation initiatives to unlock the potential for developing cross-border railways. Another opportunity is to support private railway concessions. Through the Private Sector Operations Department (PSOD), ADB has been supporting the preparation of a new mineral railway PPP in Mongolia. Potentially, PPPs can relieve governments of the burden of financing massive railways investments; speed up railway construction and introduce the modern, efficient, and cost-effective approaches to operations that are needed for railways to be competitive.

Other transport modes. While the situation varies from country to country, ADB's support for transport modes other than roads and railways has been quite limited. While aviation, ocean shipping, and ports have grown rapidly in developing Asia and the Pacific, ADB largely phased out its support for these in the early 1990s. This was because the private sector was already performing effectively in these areas. ADB did continue to support a small number of DMCs—such as Nepal, Mongolia, and various Pacific DMCs—where aviation and ocean transport have a unique role due to limitations in land transport, generally linked to factors such as geography and low population density. In the case of inland waterways, the overall growth of traffic and facilities has been slower, and ADB's involvement has been small. Only a limited number of inland waterways within the region have significant navigation potential. Their development has been constrained by the weakness of existing institutions and lack of support for modernization and reform. However, as is evident from PRC's ambitious plans to expand inland waterways transport, when governments are prepared to address the existing constraints, inland waterways

can offer a cost-effective, safe, and low-carbon mode for certain types of freight, and ADB can play a useful supporting role.

Private sector participation. In the past decade, ADB assisted some DMCs with policy, legal, regulatory, and institutional arrangements to support increased private sector participation in transport. Through its public sector operations, ADB helped governments introduce additional forms of private participation, such as build–operate–transfer concessions for toll roads and bridges, public transport service concessions, and performance- and area-based operation and maintenance contracts.¹⁰ Through private sector operations, ADB also financed innovative private ventures in the transport sector, particularly build–operate–transfer concessions.

However, the scale of ADB’s support for private sector participation needs to be greatly increased. Strategy 2020 has set an overall target that private sector operations should reach 50% of total ADB lending by 2020 (footnote 1). This will require ADB-wide changes, including in the transport sector. During 2000–2009, ADB’s average annual private sector lending for transport was only \$23 million—less than 1% of its total lending for transport. This reflects a series of problems and challenges, some concerning the wider environment for transport PPPs in DMCs, and others concerning limitations in ADB’s approach to supporting transport PPPs. At the country level, there are still problems in terms of policy, legal, regulatory, and institutional arrangements that reduce the capacity of DMCs to attract private sector interest. Within ADB, the transport lending pipeline in the country partnerships and strategies focuses primarily on public sector projects. Few staff within the transport and urban divisions have practical experience of transport PPPs, and regional departments and PSOD lack effective arrangements for knowledge sharing, coordination, and collaboration in support of ADB’s role in promoting transport PPPs.

Social and environmental considerations. As incomes and education levels in DMCs have risen, and information has become more widely available, so has the appreciation that different people and groups have different development needs and that most development interventions have both positive and negative effects. In the 2 decades since 1990, ADB has steadily increased the attention it gives to the social and environmental dimensions of development. This has changed the way it formulates transport operations and how it conducts associated policy dialogue. All transport operations now incorporate safeguards to protect people and the environment from the adverse effects of transport projects. The introduction and application of safeguards to transport projects, together with associated dialogue and capacity building support, have helped many DMCs reassess the adequacy of their domestic policies and legal provisions for providing social and environmental safeguards, and their monitoring and enforcement arrangements. In many DMCs this process is ongoing and ADB transport projects can have further influence in future. From an early stage in formulating transport operations, ADB also conducts an assessment of social and poverty issues that then influences the approach and scope of the project. This has led to inclusion of special measures or complementary project components to ensure that the poor or other disadvantaged groups benefit from the project, and to address gender dimensions and the risks of HIV/AIDS and human trafficking. Support from the Japan Fund for Poverty Reduction and other bilateral funds has played a valuable role in helping ADB address such considerations in transport projects. Incorporating social and environmental considerations will continue to be an important feature of ADB transport operations.

¹⁰ For example: ADB. 2001. *People’s Republic of China: Corporatization, Securitization and Leasing for the Road Sector*. Manila.

Anticorruption. It is widely recognized that corrupt practices remain a problem affecting the performance of the transport sector in DMCs.¹¹ Through its involvement in the transport sector, ADB has helped DMCs control such practices in a variety of ways, including at the project level and through policy dialogue and advisory activities. These have included adopting internationally recognized procurement procedures; scrutinizing project procurement activities; financial, procurement, and performance audits; supporting streamlining and reform of government procurement procedures; and introducing whistle-blower mechanisms. ADB needs to continue to pursue anticorruption and good governance in transport through policy dialogue and advisory activities. ADB support for anticorruption efforts will remain relevant for transport operations.

Emerging Needs and Challenges

As a result of past economic development, and changes in settlement patterns and in the way of life, DMCs need to address several emerging needs and challenges in the transport sector. Some of these concern aspects of transport that have received limited attention in the past; others refer to aspects that have become more important and where ADB support needs to be increased.

Urban Transport

With almost 3.9 billion people, Asia has 61% of the world's population. Its share of the world's urban population rose from 9% in 1920 to more than 48% in 2005, and is expected to reach 54% in 2030.¹² About 44 million people are being added to Asia's urban population every year, which is equivalent to 120,000 people per day. A feature of this rapid urbanization is the growth of large cities and megacities—already the region contains 10 of the world's 25 largest cities, and these are among the fastest growing.¹³ ADB has estimated that 80% of Asia's new economic growth will in future be generated in its urban economies, since this is where most jobs and employment opportunities are located.¹⁴ However, there will also be large numbers of urban residents who are poor. About 70% (800 million) of the world's poor live in Asia and, although poverty is sometimes perceived to be a rural phenomenon, the incidence of urban and peri-urban poverty is significant and growing. Although the large cities of Asia are growing rapidly, and it is forecast that more than 80% of Asia's economic growth will be in its urban areas, the reality is that, after more than 3 decades of rapid economic growth, one of the defining characteristics of Asia's cities is poverty—almost 25% of Asia's urban population is poor.¹⁵ About 250 million poor people in Asia reside in urban areas,¹⁶ and this is projected to reach 300 million by 2020.

These trends are placing an enormous strain on transport and mobility in urban areas. Road congestion already costs Asian economies an estimated 2%–5% of GDP every year due to lost

¹¹ According to Transparency International, civil works and construction ranks as the worst sector worldwide for payment of bribes to public officials and state capture. Transparency International. 2008. *2008 Bribe Payers Index*. Berlin.

¹² 2007. *World Urbanization Prospects: The 2007 Revision*. Department of Economic and Social Affairs, Population Division. New York.

¹³ By 2015, projected populations of the largest cities show four (Jakarta, Karachi, Mumbai, and Shanghai) in the 20 million–30 million range, and a further nine cities with 10 million–20 million.

¹⁴ Lohani, B. 2005. *Financing the City: ADB's Perspective*. Paper presented at the Asian Development Bank 38th Annual Meeting, 3 May 2005, in Istanbul, Turkey.

¹⁵ ADB. 2004. *City Development Strategies to Reduce Poverty*. Manila.

¹⁶ ADB. 2002. *Beyond Boundaries: Extending Services to the Urban Poor*. Manila.

time and increased transport costs. Congestion occurs where demand exceeds the capacity of the transport system, including when links in the strategic transport network are missing.¹⁷ In response to growing urban transport needs and rising congestion, there has already been a sharp rise in investment in urban transport systems, including ring roads and mass transit systems. Investment will rise considerably in the near future.

To provide sustainable urban transport solutions, the countries of Asia and the Pacific need to address rapid motorization, which is a major cause of congestion and pollution. As a result of rising incomes, per capita vehicle ownership is rising exceptionally fast; motor vehicle fleets are doubling every 5–7 years. Emerging Asian countries were expected to add 35 million vehicles between 2006 and 2009.¹⁸ Since fleets are growing from a low base, very rapid growth will continue for the foreseeable future unless other transport solutions can be found.¹⁹ The 10 countries in the world with the highest private vehicle future demand index are in Asia; these include the PRC, India, and Indonesia, the three most populous countries in the world.

Uncontrolled growth in urban road traffic and rising congestion are also compromising the health and safety of urban dwellers. The region's cities suffer from the highest air pollution levels in the world, with as much as 80% attributable to transport.²⁰ Respiratory ailments and other diseases related to local air pollution contribute to the premature death of more than 500,000 people each year. According to the World Health Organization, this imposes an economic cost of up to 2%–4% of GDP in many countries.²¹ A recent study estimated that 350,000 lives were lost due to air pollution in PRC cities in 2003, and that air pollution in the PRC resulted in more than 250,000 new cases of chronic bronchitis. The value of lives lost was equivalent to 4% of PRC's GDP. Reducing air pollution levels to those experienced in the United States in 1990 would save more than 200,000 lives annually.²² Road traffic growth has also led to increased traffic safety risks for pedestrians and cyclists.

The unprecedented growth in private vehicle ownership poses a serious development challenge. As some large Asian cities are discovering, constructing urban roads will not in itself provide a solution. Constructing new roads leads to more purchases of private vehicles, which eventually leads to the roads again becoming congested. Moreover, further road building faces severe practical limitations and escalating costs due to the shortage of land in urban areas.

Given its scale and its significance for global climate change, the emerging urban transport problem will be the biggest transport challenge for developing Asia and the Pacific in the coming years. Urban transport provision and urban development need to be closely coordinated to create more livable cities with shorter journey times and journey distances. There will also be a need to improve nonmotorized transport, and this will require principles of nonmotorized transport to be incorporated within the overall approach to urban planning. To arrive at sustainable solutions,

¹⁷ There is always some level of congestion in a city. Efficient management of congestion requires that the costs of congestion should not exceed the costs of available mitigation measures.

¹⁸ ADB. 2006. *Energy Efficiency and Climate Change Considerations for On-road Transport in Asia*. Manila.

¹⁹ In 2006, there were only 28 vehicles per 1,000 people in the PRC and about 12 in India, compared with 586 in Japan and more than 814 in the United States. World Bank. 2009. *World Development Indicators*. Washington, DC.

²⁰ Clean Air Initiative for Asian Cities Center database. www.cleanairnet.org/caiasia/1412/article-59689.html (accessed 5 May 2010).

²¹ ADB. 2008. *Managing Asian Cities*. Manila.

²² Cropper. 2009. *Measuring the costs of air pollution and health in China*. www.rff.org/RFF/Documents/RFF-Resources-173_airpollutioninChina.pdf

there will be a need for multimodal transport systems that use the most sustainable modes. To provide passengers with alternatives to private vehicle use, high-quality urban mass transit systems will need to be developed, including metro rail systems and bus rapid transit. Many of these projects will be very costly and will require sophisticated approaches to financing, tariffs, technology, and operations. At the same time, cities will need to find better ways of managing growth in vehicle ownership and use. As has been demonstrated in Singapore and London, vehicle or road pricing mechanisms can play a central role. These have the added advantage that they can generate financial resources to expand and maintain the urban transport network and systems.

Climate Change and Energy Efficiency

Asia's emissions from motorized transport have become a significant contributor to the global problem of greenhouse gas emissions that leads to climate change. Energy use in the transport sector is dominated by petroleum product fuels. The share of transport within total global greenhouse gas emissions, in particular CO₂, is growing rapidly, with the vast majority of projected increased expected to come from developing Asia. In 2006 transport accounted for 13% of global greenhouse gas, while 23% of global CO₂ emissions from fuel combustion were transport related. Asia accounted for 19% of total transport sector CO₂ emissions in 2006 but by 2030 this figure will increase to 31%.²³ Hence, addressing transport emissions in Asia is crucial for the global CO₂ mitigation effort.

As a result of rapid motorization, energy use for transport is expected to increase dramatically in the years up to 2025, accounting for an additional 30% of world energy requirements. At 2.7% per year, the projected average growth rate for transportation energy use in the non-Organisation for Co-operation and Development (OECD) countries from 2006 to 2030 is eight times higher than the projected rate for OECD countries. The use of liquid fuels in the non-OECD transport sector as a whole is expected to nearly double over the period. In Asia, passenger and freight transportation energy consumption is expected to increase more rapidly than in the other non-OECD countries.²⁴ This will have significant implications for energy demand, pollution (global and local), and energy security across the region. Most Asian countries are importers of fossil fuels, and recent experience has shown that fuel price volatility can have severe impacts on the economy and on the lives of poor and low-income people.

In view of the priority accorded internationally to the issue of climate change, there is an urgent need for ADB to assist in developing effective, efficient solutions that can work on a large scale in the transport sector in developing Asia. A useful conceptual tool to guide this work at the country and regional levels is the "avoid-shift-improve" approach:²⁵

- **Avoid** means reducing the need to travel, for example, by integrating land use and transport planning to create local clusters of economic activity that require less mobility; by changing how production is organized (e.g., doing more online); and by developing multimodal logistics chains to cut wasteful and unnecessary trips.
- **Shift** means changing to more energy-efficient modes or routes, such as shifting from road to rail or waterways, or onto well-defined trucking routes, or shifting passengers from private vehicles to public transport and nonmotorized modes.

²³ International Energy Agency. 2008. *World Energy Outlook*. Paris.

²⁴ Energy Information Administration. 2009 *International Energy Outlook*. www.eia.doe.gov/oiaf/ieo/transportation.html

²⁵ ADB. 2009. *Changing Course: A New Paradigm for Sustainable Urban Transport*. Manila.

- **Improve** means using technologies that are more energy efficient, including through improving vehicle standards, inspection, and enforcement; developing improved vehicle technologies and fuels; and improving transport efficiency using information technology.

A further dimension of climate change is that transport investments are vulnerable to the effects of climate change. Such effects include rises in sea levels; changes in permafrost conditions and locations; changes in precipitation; and increases in the frequency and intensity of storms, floods, and droughts. These have consequences for the design, construction, and alignment of roads, railway tracks, and other transport infrastructure. At the same time, the development of transport infrastructure can inadvertently increase vulnerability to climate change effects, e.g., by reducing natural flood control ecosystems and disrupting migratory patterns of sensitive species. Transportation systems also influence patterns of settlement, which can result in population concentrations in areas that are becoming more prone to extreme weather conditions and disasters. To address these challenges, ADB is undertaking a number of case studies and developing improved analytical tools to systematically integrate adaptation measures into ADB transport operations.

Regional Cooperation and Integration

Globalization and rapid growth of trade are major drivers of economic development and poverty reduction in Asia and the Pacific. By 2020 the region could account for one-third of world trade. Intraregional trade now accounts for 55% of the region's total trade, compared with 43% in the early 1990s.²⁶ Globalization has led to the region's economies becoming more closely intertwined with each other and the rest of the world, and international supply chains span the region to utilize each country's comparative advantage. As tariff barriers diminish, transport costs and bottlenecks emerge as constraints on trade growth. These include the indirect costs associated with unreliable transit times, border-crossing delays, handling and storage costs due to poor terminal infrastructure, risks of theft and property damage, and bribes. Finding solutions to these problems is especially important for landlocked countries that rely on transit through neighboring countries to gain access to international markets.

ADB supports several subregional programs that include substantial transport components.²⁷ A recent IED sector assistance program evaluation found that the Greater Mekong Subregion program has led to benefits that would not have been realized through national initiatives alone.²⁸ ADB support for transport and trade facilitation has led to significant savings in vehicle operating costs and travel time, and reduced border-crossing times. It has also led to expanded economic activities, with new industries and special industrial zones developing along the regional road corridors. However, IED also found that, to achieve the full potential benefits, there is a need to improve the “software” aspect of cross-border agreements and regional institutions.²⁹

²⁶ ADB. 2006. *Regional Cooperation and Integration in Asia*. Background paper for the Asia 2015 Conference. London. 6–7 March.

²⁷ ADB has been supporting several subregional programs: (i) Greater Mekong Subregion (GMS) Program; (ii) Central Asian Regional Economic Cooperation (CAREC); (iii) South Asia Subregional Economic Cooperation (SASEC); (iv) South Asian Association for Regional Cooperation (SAARC); (v) Indonesia–Malaysia–Thailand Growth Triangle (IMT-GT); and (vi) Brunei Darussalam–Indonesia–Malaysia–Philippines East ASEAN Growth Area (BIMP-EAGA).

²⁸ ADB. 2008. *Sector Assistance Program Evaluation of Transport and Trade Facilitation in the Greater Mekong Subregion—Time to Shift Gears*. Manila.

²⁹ IED also saw opportunities for expanding transport and trade facilitation by raising additional funding from the private sector and other development partners.

In adopting regional cooperation and integration as one of ADB's three long-term strategic agendas, Strategy 2020 challenges ADB to substantially expand the scale, influence, and effectiveness of its support for regional cooperation. In the transport sector, this will mean accelerating the investments needed to complete the regional road networks, establishing programs of investments to create a competitive regional railway network, and developing faster and more effective ways of helping regional partners streamline cross-border rules and procedures. A recent ADB–ADB Institute study sets the long-term vision of a “seamless Asia—an integrated region connected by world-class, environmentally friendly infrastructure—in terms of both ‘hard’ (physical) and ‘soft’ (facilitating) infrastructure,” and estimates that improved transport and harmonization of regulations to facilitate new trade and transport patterns would generate \$13 trillion in increased income for Asia over the next 10 years (footnote 7).

Road Accidents and Emerging Social Issues

One of the most serious adverse effects of the rising traffic on Asia's roads has been growing road accidents. Out of an estimated 1.18 million deaths and millions of injuries globally each year due to road accidents, 60% occur in Asia.³⁰ This reflects not only traffic growth but also high road accident rates—accident rates in DMCs are much higher than in advanced countries.³¹ The burden of road accidents falls disproportionately on the poor. According to the World Health Organization, almost half of those who die in road traffic crashes are pedestrians, cyclists, or users of motorized two-wheelers, and this proportion is higher in poorer economies.³² Among the member countries of the Association of Southeast Asian Nations (ASEAN) alone, road accidents cost an estimated \$15 billion each year.

While ADB and other international agencies have long supported road safety in developing countries, such support has not been on a large enough scale or on a sufficiently sustained basis to close this gap. Recent international initiatives have highlighted the extent of the road accident problem, which has been identified as a major public health issue (the leading cause of premature death and disability for children aged 5 and above³³). At the First Global Ministerial Conference on Road Safety in Moscow in November 2009, ADB and other multilateral development banks made a commitment to increase their support for road safety, including road safety management capacity; safe approaches to the design, construction, operation, and maintenance of road infrastructure; road safety performance measures; and mobilizing resources for road safety.

It will not be easy for DMCs to make transport safer. Road safety depends not only on having safer infrastructure and vehicles, but also on changing driver behavior and supporting law enforcement, emergency response, and medical facilities. The multisector nature of road safety means that it requires coordination among government agencies and cooperation between government and members of society. Countries need effective safety legislation and institutions, and good safety practices. They also need systematic, comprehensive accident reporting systems; safer engineering design and safety audit systems; education and awareness programs, aimed particularly at children; improved driver training and vehicle testing; effective enforcement of legislation; and emergency rescue systems.

³⁰ ADB. 2005. *Arrive Alive. ASEAN Regional Road Safety Strategy and Action Plan (2005–2010)*. Manila.

³¹ In most DMCs, the reported rates of road accident deaths per 100,000 people are several times higher than in advanced countries. Due to underreporting, actual rates in DMCs are believed to be several times higher again.

³² World Health Organization. 2009. *Global Status Report on Road Safety: Time for Action*. Geneva.

³³ Commission for Global Road Safety. 2009. *Make Roads Safe A Decade of Action for Road Safety*. London.

In addition to road accidents, more attention needs to be given to realizing the potential positive social impacts of transport and to avoiding and mitigating negative social impacts. Since ADB's overarching goal is poverty reduction, its work on transport should contribute to providing effective solutions to the transport needs of the poor. More effective approaches are also needed for addressing other social dimensions of transport, including gender mainstreaming, participation, and social risks other than those covered by ADB's safeguard policies. These include (i) more participatory approaches to project planning and project strategies to protect against associated HIV/AIDS and human trafficking risks, (ii) incorporating complementary development programs and community-based maintenance, (iii) improving transport services, (iv) providing improved facilities such as public toilets and pedestrian and bicycle lanes to make transport accessible and safe for all users and social groups including women and the elderly, (v) applying core labor standards, and (vi) using tariff and subsidy options to increase access for vulnerable groups.

Future Sustainable Transport Operations

This STI operational plan identifies three main categories of future ADB transport operations. The first category is operations to address continuing needs and challenges where ADB already has a track record of effective operations. This category will constitute the majority of ADB transport operations during the initial years of the STI operational plan and will still account for a substantial portion in 2020. For such operations, the STI will focus on mainstreaming sustainable transport considerations into ADB's approach. The second category is opportunities to introduce new or enhanced operations to address emerging needs and challenges where effective forms of support are already available. These will provide early opportunities to realign ADB's transport operations with Strategy 2020. The third category is potential elements of future sustainable transport operations that require research, consultation, and pilot testing before they can be included in ADB transport operations. These could lead to new types of operations in the later part of the operational plan period.

Mainstreaming Sustainable Transport in Existing Areas of Operations

ADB's existing areas of transport operations—focusing mainly on roads—will remain relevant in most DMCs during the next decade, especially in areas relating to asset management and maintenance. Having an established competence in these areas, as well as close working relationships with executing agencies, ADB is well placed to continue to provide support. At the same time, the adoption of sustainable transport as ADB's guiding principle in transport will require departments and transport staff to review their approach to the existing areas of operations. They will need to question how well past approaches have addressed the multiple dimensions of sustainable transport, and draw upon new sources of ideas and expertise to strengthen sustainability in future. Sustainable transport will need to be mainstreamed into the transport sector road maps in future country partnerships and strategies, and in the approach to formulating and implementing transport and technical assistance projects. This change process will require strategic leadership from the Transport Community of Practice (TCOP), staff training and capacity development, effective use of knowledge and collaboration with knowledge partners, and greater selectivity to focus ADB's role on aspects of sustainable transport where it can offer greatest value addition.

While previous transport sector road maps and projects have addressed some dimensions of sustainable transport, few have done so comprehensively, and this has led to gaps and blind spots. For example, some projects aimed to reduce transport costs and increase vehicle speeds without considering how to avoid some of the adverse impacts this might bring, such as increased road accidents, noise, and emissions. Some projects built highways to make transport more accessible and affordable but did not improve connecting rural roads and bus services or provide facilities needed for women's use of transport. Some projects emphasized cost recovery to support financial and asset sustainability but did not ask if tariff levels were affordable or whether subsidies were justified for some groups. In future, the mainstreaming of

sustainable transport will involve giving attention to all the elements of sustainable transport, and finding the best balance between them to develop transport systems that are accessible, affordable, safe, and environment-friendly. Appendix 2 provides some examples of options to be considered in formulating future road projects.

Mainstreaming sustainable transport in ADB will begin with disseminating and promoting the STI operational plan within ADB through seminars, workshops, and TCOP meetings. The STI will be formally launched at the 2010 ADB Transport Forum on 25–27 May 2010, in the presence of a large audience of ADB staff, DMC officials, development partners, donors, representatives of the private sector and nongovernment organizations (NGOs), and the media. The biannual ADB Transport Forum is ADB's largest knowledge-sharing event for transport. The program for the 2010 forum will be devoted to the STI, and will feature presentations and discussions on aspects of sustainable transport that ADB expects to support in future. As part of the forum, each of the 16 TCOP advisory teams will conduct an activity clinic to assess how sustainable transport should affect ADB's approach in their respective fields of transport.³⁴

The TCOP committee members and advisory teams will carry forward the dialogue on sustainable transport within ADB—at the departmental level and within transport and urban divisions, and among staff with expertise in various specialized fields of transport. In doing so, the TCOP will work closely with other communities of practice that can contribute to ADB's approach to sustainable transport—including those for health, gender, environment, urban development, rural development, education, regional cooperation, and private sector development—and will explore opportunities for involving external partners in the TCOP. Building upon the outputs of transport forum activity clinics, each TCOP advisory team will prepare a sustainable transport action plan for incorporating improved approaches, strengthening capacity and staff training, and providing access to knowledge in their respective specialized fields of transport. Drawing upon these action plans, the TCOP will prepare and implement a consolidated staff training program in sustainable transport to be financed from the staff training budget.

TCOP's quality assurance role within ADB's streamlined business processes will provide an important entry point for mainstreaming sustainable transport within individual transport operations. Beginning at the concept stage, the TCOP will use its sector-focused peer reviews of transport sector road maps and individual transport project proposals to strengthen the sustainable transport focus of future transport operations.

The TCOP will establish a special section on sustainable transport in its electronic library of best practices in transport. This will provide staff with web-based access to international and ADB best practices. The TCOP will also work in collaboration and partnership with DMCs, development partners, and centers of excellence to create new and improved mechanisms for knowledge sharing on sustainable transport, including through websites, exchange visits, and workshops and seminars.

While many DMCs still require considerable investment in new road infrastructure, there is also a need to give more attention to the sustainability of existing road assets. ADB will provide increased support for asset management and road maintenance. This will include financing programs to establish and implement improved systems for selecting, implementing, and

³⁴ The TCOP has 16 advisory teams covering the following specialized fields of transport: highways, rural roads, road asset management, road safety, road transport services, railways, ports and water transport, air transport, cross-border transport and logistics, urban transport, climate change and vehicle emissions, private sector and public-private partnerships, transport economics, financial management in transport, social and environmental sustainability, and administration of transport projects.

financing road maintenance works, as well as financing investments in road rehabilitation and programs to reduce maintenance backlogs.

A further aspect of mainstreaming sustainable transport concerns private sector participation. Since greatly increased private sector participation will be essential if the region’s enormous infrastructure financing needs are to be met, ADB’s infrastructure operations will need to become more effective at attracting private sector participation. This challenge extends across all infrastructure sectors—not just transport—and will require ADB-wide efforts to strengthen ADB’s orientation toward private sector participation, augment its capacity for supporting PPPs, optimize synergies between regional departments and the Private Sector Operations Department (PSOD), and develop financing models capable of attracting private sector participation on a much larger scale. Emphasizing private sector participation in transport will therefore be an integral part of mainstreaming sustainable transport.

The final part of mainstreaming sustainable transport will be to encourage selectivity in ADB’s approach to supporting sustainable transport. To optimize its contribution, ADB should focus on roles within sustainable transport where it can significantly add value. The optimal focus will vary from country to country but the following approaches will generally be considered:

- **Use knowledge.** In addition to country knowledge, the design of ADB operations should build on ADB-wide and international best practices in sustainable transport.
- **Add value.** ADB financing should be channeled to projects and activities where ADB involvement will result in increased sustainability.
- **Be catalytic.** ADB assistance should help DMCs overcome sector obstacles to wider adoption of sustainable transport.
- **Scale up successful approaches.** ADB should help DMCs to replicate successful approaches to sustainable transport on a larger scale.
- **Attract additional financing.** ADB should use innovative approaches to attract partners to provide additional financing to expand the scale of investments in sustainable transport.
- **Emphasize private sector participation.** Within transport sector road maps and project proposals, ADB should exert vigorous efforts to identify projects that can be implemented as PPPs.

Introducing New and Enhanced Sustainable Transport Operations

The STI operational plan identifies four opportunities for introducing new and enhanced ADB lending operations to scale up ADB’s support for sustainable transport (Table 2).

Table 2: Opportunities for New and Enhanced Sustainable Transport Operations

No.	Name	Focus of Lending Operations
1.	Urban transport	Scale up operations, model projects
2.	Addressing climate change in transport	Model projects for mode shifting and distance shortening
3.	Cross-border transport and logistics	More effective transport facilitation within planned and existing operations
4.	Road safety and social sustainability	Scale up operations, model projects, best practices

Source: ADB.

Urban Transport

During the first phase of the STI, ADB has studied and pilot tested various approaches to urban transport operations, including public mass transit systems.³⁵ While the scope of ADB urban transport operations will depend on DMC needs, taking into account good practice and the lessons from ADB experience, the following elements are likely to feature, both individually and in combination:

- **Public transport systems.** These are needed to provide urban populations with safe, secure, accessible, rapid, efficient, and user-friendly transport, and to reduce pollution, congestion, and accidents. ADB support will include bus rapid transit and rail-based public transport systems.
- **Nonmotorized transport.** Integrated urban transport solutions should make provision for nonmotorized transport infrastructure together with pedestrian zones and walkways, segregated cycle paths, and bicycle parking and rental programs.
- **Integrated urban transport planning.** Urban transport plans should be integrated with urban land use plans to support more efficient approaches to planning urban expansion and redevelopment, limit trip lengths needed, make sustainable modes convenient for users, and optimize system integration.
- **Demand management.** In parallel with improving public transport and nonmotorized transport, cities need to use demand management to limit congestion and improve traffic flows by reducing the attractiveness of private vehicle use in busy urban areas. Options range from relatively simple systems, such as charging for vehicle licenses and parking fees, to more advanced computerized road-pricing schemes.
- **Traffic management.** Traffic engineering and traffic management systems are needed to optimize traffic flows on the available urban transport infrastructure.

Until 2005, ADB's urban transport operations were less than 2% of transport lending (inclusive of lending through transport divisions and urban divisions). After 2005 urban transport operations started to expand rapidly, and are expected to reach 16% of transport lending by 2011.³⁶ ADB is therefore already rapidly scaling up its urban transport operations. To ensure the success of this process, the STI will provide regional departments with additional expertise and resources to help them establish and consolidate high-quality transport lending operations.

To assist regional departments while they are still building urban transport expertise, ADB will recruit urban transport experts with strong operational expertise to work full-time in assisting regional departments with urban transport operations. Through the TCOP, ADB will also form partnerships with international and regional institutes and NGOs to provide specialized urban transport expertise as needed.

³⁵ Including through the following regional technical assistance projects: ADB. 2006. Technical Assistance for Sustainable Urban Transport. Manila (TA 6350-REG); ADB. 2007. Technical Assistance for a Development Framework for Sustainable Urban Transport. Manila (TA 6416-REG); and ADB. 2009. Technical Assistance for Preparing the Implementation of Asian City Transport—Promoting Sustainable Urban Transport in Asia Project. Manila (TA 7243-REG).

³⁶ Urban transport projects in the pipeline include the following: Hanoi Metro Rail System and Ho Chi Minh City Metro Rail System in Viet Nam, Sustainable Urban Transport in Georgia, Kathmandu Urban Transport in Nepal, Xi'an Urban Transport in the PRC, Ulaanbaatar Urban Transport in Mongolia, Greater Dhaka Sustainable Urban Transport Corridor in Bangladesh, Pimpri Bus Rapid Transit Project in India, and Yerevan Sustainable Urban Transport in Armenia.

Addressing Climate Change in Transport

While some approaches to addressing climate change and energy efficiency in the transport sector may yield results only in the medium to long term—e.g., developing new types of vehicle technologies—there are other opportunities for ADB to contribute to early improvements on a large scale. This can be done by expanding operations to **shift** traffic to modes with lower emissions and energy consumption, and **improve** transport efficiency on existing modes as follows:

- **Mode shifting.** Railways and inland waterways can offer more efficient, lower emission transport solutions for long-distance freight and passenger traffic. This is particularly so when they are supported by improved logistics facilities and services to offer effective multimodal transport solutions that combine the comparative advantages of the different modes. There is also potential for increasing the share of mass transit systems and nonmotorized transport within urban transport.
- **Distance shortening.** Strategic investments in missing links can shorten journey distances on existing modes, thereby reducing emissions and energy use.

Through the STI, ADB will expand its operations for developing competitive long-distance railways and inland waterways, and provide support for investment in missing links that will reduce energy consumption and emissions through distance shortening. These will serve as demonstration projects to encourage wider use by DMCs. In supporting railways and inland waterways, ADB will be promoting business models capable of realizing the potential competitiveness of these modes—within the public sector, privately, or through PPPs. To support regional departments and PSOD in this work, the STI will make available additional specialized expertise in railways, inland waterways, logistics, transport PPPs, and transport emissions measurement. The STI will also support regional departments and PSOD in accessing global climate change funds.

ADB will also mainstream climate adaptation measures into its transport operations. These will include making climate adaptation adjustments to engineering specifications, alignments, and master planning; incorporating associated environmental measures; and adjusting maintenance and contract scheduling.

Cross-Border Transport and Logistics

As part of ADB's support for regional economic integration, transport has a critical role to play in enabling growth in trade. ADB has already provided substantial lending for constructing regional road infrastructure and has a large pipeline of planned lending operations. The long-term effectiveness and sustainability of these operations will depend not only on constructing transport infrastructure but also on incorporating efficient solutions to enable seamless regional transportation of goods from point of loading to point of discharge.

ADB's regional transport operations will need to incorporate improved approaches to assisting DMCs with transport facilitation.³⁷ This includes simplifying formalities, processes, and procedures; harmonizing national procedures, operations, and documents with international

³⁷ Trade facilitation also has an important role to play in regional economic integration. Trade facilitation may be defined as the simplification and harmonization of international trade procedures including the collection of presenting, communicating, and processing data required for more efficient movement of goods in international trade. Efforts to support transport facilitation need to be closely coordinated with those to support trade facilitation.

conventions, standards, and practices; and standardizing in accordance with internationally agreed formats for practices, procedures, documents, and information. There is also a need to address bottlenecks in freight mobility and reduce the turnaround time of cargo vehicles, including by providing facilities, equipment, and infrastructure to streamline transport connections at gateways, ports, and feeder connections, and creating dry-port facilities and logistics centers, including in hinterland areas. Attention will be given to addressing the special needs of landlocked countries.

Under the STI, ADB will establish a specialized transport facilitation team at staff level. This will be supplemented by technical assistance and by establishing partnership arrangements with transport research and representative organizations. This will be used to lead a concerted approach to implement transport facilitation on a corridor-by-corridor basis as part of ADB's support for regional transport corridors, including for both existing and proposed projects. The time frames for this support will be adjusted to fit with the requirements to implement transport facilitation solutions. Results monitoring will be integrated within ADB's results-based monitoring of subregional programs.

ADB will also assist DMCs and regional cooperation organizations to draw up plans and investment programs to create a competitive regional railway network. This can build upon recent progress at the country level, including the development of advanced passenger and freight railways in the PRC to link its major economic centers and connect with its borders, progress with railways upgrading and introduction of cross-border services in India and Bangladesh, and the renewed interest in regional railways among the countries of Southeast Asia and Central and West Asia. This is potentially a major new area for regional cooperation, and ADB will be required to recruit additional railway experts and long-term consultants.

Road Safety and Social Sustainability

To have a more sustainable impact on road safety in DMCs, ADB needs to increase the scale, quality, duration, and continuity of its support for road safety. Though the STI, ADB will develop comprehensive road safety operations in selected DMCs, based on providing stand-alone lending for road safety. These operations will support engineering and behavioral approaches to the safe design, construction, operation, and maintenance of road infrastructure; the use of intelligent transport systems (ITSs) for road safety; and the development of road safety management capacity, road safety performance measurement, and resource mobilization. In view of the complex nature of the road accident problem, the need to involve multiple agencies and civil society, and the current limitations in the institutional capacity of DMCs in road safety, ADB will provide substantial technical assistance for advisory, capacity development, and project preparation purposes.

To support social sustainability, ADB will expand its work on pro-poor dimensions of transport, including through improving rural bus services and nonmotorized transport, and on other social dimensions of transport—including gender mainstreaming, participation, HIV/AIDS and human trafficking, core labor standards, and use of tariff and subsidy options—to optimize the balance between accessibility and affordability.

To provide the expertise that regional departments will initially need to scale up and improve their approach to road safety operations, the STI will recruit road safety experts to join as staff of a new road safety unit in the Regional and Sustainable Development Department. These staff members will work full-time on assisting regional departments to prepare and implement model road safety operations, and will also develop guidelines and sample terms of reference for incorporating road safety considerations at each stage in the project cycle. To support this work and expand ADB's work on social sustainability, a technical assistance facility will be

established to procure specialized consulting services in the fields of road safety and social sustainability. ADB will also establish partnership agreements to support increased collaboration with reputable international road safety organizations and social development institutes active in developing Asia.

Preparing New Types of Sustainable Transport Operations

The STI operational plan also identifies several opportunities for further expanding and improving ADB's support for sustainable transport over the medium term. These focus on assisting DMCs to incorporate sustainability considerations within transport investment planning and policies, and conducting research and pilot testing to establish new types of support that ADB could introduce within its operations by the second half of the STI operational plan period.

Sustainable transport development plans. In the 1970s and 1980s, the international community helped many countries to prepare national transport plans that were used to guide prioritization between modes and to plan transport investment programs. At that time the yardstick was economic efficiency, focusing mainly on the direct economic costs and benefits of the different transport modes used. Today this yardstick needs to be augmented to account for carbon emissions and other adverse externalities. A new type of sustainable transport development plan is needed to take a fresh look at the future roles of different transport modes and to guide medium- and long-term priorities and policies to bring about sustainable transport.³⁸ Preparation of such plans can play a significant role in supporting application of the avoid–shift–improve approach.

Support for preparing sustainable transport development plans will provide ADB an opportunity to provide more policy support and have strategic influence on the policies of DMCs to guide the long-term transport mix in developing Asia. Through the STI, ADB will provide technical assistance support to help several DMCs prepare sustainable transport development plans.³⁹ The level of technical assistance resources will be sufficient to prepare highly professional plans that can form a model for wider replication. The DMCs will be selected based on their level of interest in developing comprehensive integrated plans for sustainable transport development. The plans will focus at the national, regional, or city level. To enable full consideration of choices between modes, the implementation arrangements will ensure that the plans are developed and approved at a high government level, e.g., by having an inter-ministerial steering committee chaired by a minister responsible for finance or planning, or by a transport minister responsible for all modes.

Transport demand management and road pricing. Trends in advanced countries suggest that advanced approaches to transport demand management and road pricing have an important role to play in sustainable transport in developing Asia, especially in urban areas. Private vehicles have to be managed through physical means or pricing to address increasing congestion, pollution, and safety and health aspects, and ensure full cost recovery. Restrictive measures—such as traffic limitation for certain types of vehicles in certain areas or corridors, road rationing through alternative driving schemes, vehicle purchase auctions and compulsory scrapping of old and

³⁸ Sustainable transport development plans would also have implications for other aspects of urban development and renewal, and would require investments in other related infrastructure (e.g., infrastructure required for higher-density developments near stations and transportation hubs).

³⁹ In several DMCs, the United Nations Centre for Regional Development is supporting the preparation of environmentally sustainable transport strategies.

inefficient polluting vehicles—are fairly simple but effective transport management tools. An efficient transport pricing system that correctly reflects transport costs including externalities is a powerful tool for promoting a sustainable and balanced transport system. Examples include road tolling, area or cordon pricing for urban centers, parking pricing, subsidized transit fares, pay-as-you-drive vehicle insurance schemes, and fuel or vehicle tax increases.

While ADB is already supporting simpler types of demand management within its operations, it has potential to act as a center of excellence and knowledge conduit to support the use of more advanced transport demand management options, including automated systems of road pricing. As part of the STI, ADB will build its knowledge and expertise in how to apply advanced traffic management and road pricing in Asia with a view to introducing components in its transport operations in the latter part of the STI operational period. To support this, ADB will establish a staff position for a transport demand management and road pricing expert, establish partnerships with institutes and existing government practitioners to support knowledge acquisition, and provide support for future operation. It will also undertake regional technical assistance to examine and share best practices and conduct prefeasibility studies of prospective advanced schemes that can be taken up by regional departments.

Intelligent transport systems. The use of information technology through intelligent transport systems (ITSs) is likely to be another major tool for sustainable transport in future. ITSs already include equipment and in-vehicle technology and software for traveler information, transport systems management, driving assistance, and electronic transactions. They can benefit transport managers, users, and the environment by offering improved operational efficiency and reduced travel uncertainty, and can reduce avoidable trips and increase safety. The use of ITSs can improve real-time traffic management, reduce congestion, reduce the need for additional infrastructure, and provide more accurate information to support traffic monitoring, forecasting, and investment project design.

As part of the STI, ADB will conduct studies to assist DMCs to demonstrate the potential for using ITSs. It will also support development of the necessary environment and system architecture to support ITS acquisition, adaptation, and development at sector level, with a view to subsequent expansion of ITS investment components within future ADB transport lending.⁴⁰

Vehicle, engine, and fuel technology. Advances in vehicle technology are expected to influence future cost-effectiveness, energy efficiency, and emissions reduction in the transport sector. While ADB has little role in vehicle technology research and commercialization, it may be able to support the introduction and take-up of more sustainable vehicle-related technologies by assisting governments to establish and implement policies, standards, and enforcement mechanisms. It will also explore potential roles as a catalyst to assist governments and vehicle manufacturers to work together to develop more sustainable technologies.

Other future opportunities. During STI implementation, other opportunities are expected to also be identified. These could include, for example, examining the potential of promising new transport technologies; studies to improve understanding on behavioral determinants of transport demand, congestion, and road safety; and updating ADB's approach to economic analysis of transport projects to incorporate various dimensions of sustainable transport. Depending on their relevance and potential to contribute to sustainable transport, such additional opportunities could be considered for inclusion in the STI.

⁴⁰ ADB has recently assisted PRC's Ministry of Transport to formulate policy recommendations, an action plan, and guidelines for a national transport information system integrated across modes, jurisdictions, and network levels.

Implementation of the Operational Plan

Introduction

The STI is a change initiative. It focuses on adapting ADB's transport operations to serve the changing transport needs of DMCs, taking into account the diversity of these needs. This staff working paper indicates the major directions and time frames for the changes required, and outlines the proposed arrangements for establishing partnerships to support implementation.

Time Frame

Implementation will be undertaken in three phases (Table 3). Phase 1 will cover 2010–2011, and its focus takes into account the need to initially mainstream sustainable transport and build ADB's capacity for undertaking sustainable transport operations. It also allows for phases 2 and 3 to incorporate the lessons from implementation of phase 1, and to introduce further types of support for sustainable transport after conducting initial research and pilot testing. The STI operational plan will be updated before the start of phases 2 and 3.

Table 3: Implementation Phases of the Sustainable Transport Initiative

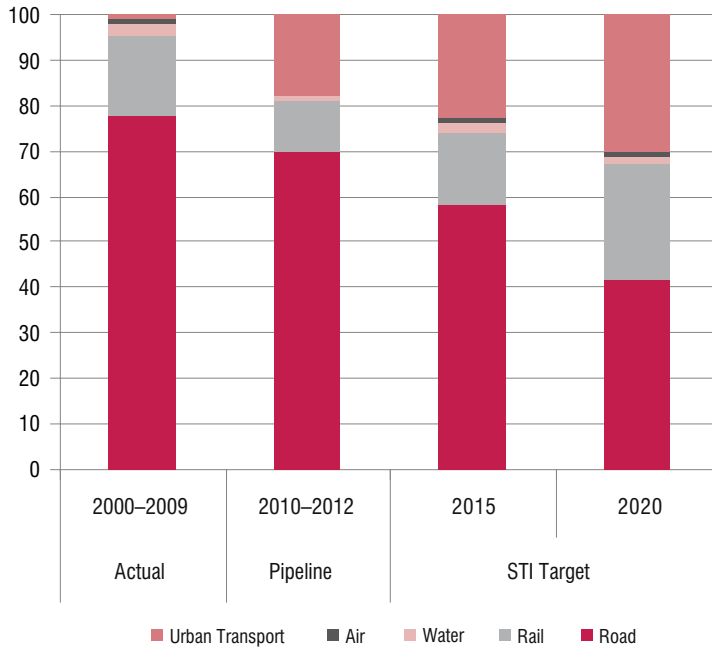
Phase	Years	Focus
1	2010–2011	Mainstreaming sustainable transport in existing areas of operations Initial implementation of new and enhanced sustainable transport operations Studies and pilot testing of new types of sustainable transport operations
2	2012–2015	Full implementation of new and enhanced sustainable transport operations Initial implementation of new types of sustainable transport operations
3	2016–2020	Full implementation

Source: ADB.

Directional Targets

Implementation of the STI will build upon and extend the patterns of changes in the transport lending pipeline for 2010–2012 that are already evident in the existing country partnerships and strategies. There will be a shift in the transport sector portfolio of ADB. The changes will include (i) a significant expansion in the lending for urban transport and railway projects, and (ii) lending for roads will continue to rise, but by 2020 it will be overtaken by other transport sectors. Subsector shares within past public sector transport lending and the lending pipeline, and directional targets for 2015 and 2020, are shown in Figure 2.

**Figure 2: Subsector Shares of ADB Transport Lending—
Actual, Pipeline, and Target
(%)**



STI = Sustainable Transport Initiative.

Source: ADB.

Sustainable Transport Partnership Facility

ADB plans to establish the Sustainable Transport Partnership Facility (STPF) to provide a mechanism for partners to provide financing and expertise to support the STI. The STPF will also act as a catalyst to support the preparation and implementation of innovative forms of support for sustainable transport within individual ADB operations.

The **partnership window** of the STPF will provide a mechanism for donors, research institutes, and NGOs to provide financing, expertise, and in-kind support to contribute to the work of the STI to improve and increase ADB's operations to support sustainable transport. The following are examples of support through this window:

- **Financing contributions.** For financing the STI operational plan, the regional technical assistance, or specific elements of these. This may include donor financing of partnerships with centers of excellence (such as reputable institutes and NGOs with expertise in specialized fields of transport required for the STI).
- **Expertise contributions.** Provision of specialized expertise required for the STI core group and for other possible STI roles through provision of staff on secondment, fixed-term staff, and long-term consultants. This may include self-financed contributions of expertise by centers of excellence.

The **innovation window** of the STPF will provide grants to finance a range of measures that will generally include one or more of the following:

- **Policy advisory work on sustainable transport.** To support DMC transport strategies and policies that provide incentives for the development of low-carbon transport—including through land-use planning, hybrid and alternate fuel vehicles, fuel economy norms, traffic demand management, and sustainable financing mechanisms.
- **Prefeasibility and feasibility studies for sustainable transport projects.** For example, heavy and light rail, metros, bus rapid transit systems, public transport services, franchising structures, service rationalization, paratransit, and cycling and pedestrian infrastructure.
- **Finance "add-on" components to existing projects that enhance sustainability.** For example, safety components, traffic management, fleet renewal and replacement with low-emission vehicles, integrating public transport systems and ticketing, bicycle hire schemes, and establishing revolving funds to finance sustainable transport improvements in cities.

As transport is recognized as one of ADB's areas of comparative advantage, and the STI operational plan seeks to refine ADB's transport operations to address key agendas that have widespread international support, it is expected that development partners will wish to support the STI. The STPF will provide partners with a unique opportunity to help in shaping ADB's future approach to transport—one of the main sectors of ADB's operations. The STPF is therefore expected to attract significant participation from development partners.

Appendix 1

Highlights from Strategy 2020

Strategic Agendas

Inclusive Economic Growth

Support by the Asian Development Bank (ADB) will include investing in (i) infrastructure to achieve high sustainable economic progress, connect the poor to markets, and increase their access to basic productive assets; and (ii) education and essential public services, such as water and sanitation, which particularly benefit the poor and women.

Environmentally Sustainable Growth

ADB will support the use of environment-friendly technologies, adoption of environmental safeguard measures, and establishment of institutional capacities to strengthen their enforcement.

Regional Integration

ADB will step up implementation of its regional cooperation and integration strategy to accelerate economic growth, raise productivity and employment, reduce economic disparities, and achieve closer policy coordination and collaboration in support of regional and global public goods, including work to combat climate change and HIV/AIDS.

Drivers of Change

Private Sector Development and Private Sector Operations

To spur market-led growth, ADB will invest in infrastructure and advise governments on the basics of a business-friendly environment, including reliable rules, regulations, and policies that do not disadvantage private sector enterprise. Change will be catalyzed through greater private investment in developing member countries through direct financing, credit enhancements, risk mitigation guarantees, and innovative new financial instruments. ADB will promote public–private partnerships in all core operational areas, gaining experience first in middle-income economies, and then expanding the efforts to all developing member countries.

Good Governance and Capacity Development

ADB will bring the four elements of good governance—accountability, participation, predictability, and transparency—deeper into the mainstream of its operations and activities. ADB will regard accountability for economic performance, effectiveness of policy formulation and implementation, and the efficient use of public resources as essential to preserving financial resources for development purposes.

Gender Equity

ADB will promote gender equity through operations that deliver specific gender outcomes, such as improved access for women and girls to education and health services, clean water, better sanitation, and basic infrastructure.

Knowledge Solutions

ADB's knowledge services will address its clients' immediate knowledge needs, while determining and passing on best practices. ADB will support pilot projects from which lessons will be distilled and disseminated. ADB will distribute knowledge in ways that have both an immediate impact and catalytic force—e.g., the knowledge of how a developing member country can approach public–private partnerships to provide social services and achieve benefits for the poor.

Partnerships

To meet the region's many development challenges and deliver aid effectively, ADB will expand and diversify its engagement with partnerships. Current arrangements include international development agencies, multilateral and bilateral institutions, and nongovernment and community-based organizations. New arrangements that include the private sector and private institutions will be forged.

Appendix 2

Some Considerations for Making Road Projects More Sustainable

Aspect of Sustainability	Examples of Options to Consider
Affordability	<p>Affordability requirements of different social groups</p> <p>Range of different technology options</p> <p>Arrangements for provision and regulation of transport services</p> <p>Approach to tariffs and subsidies</p>
Accessibility	<p>Need for rural roads if there are major gaps in rural accessibility</p> <p>Local road components to link new highways with hinterland population</p> <p>Programs of small rural infrastructure investments to provide year-round access, e.g., bridge repair, drainage, minor road improvements</p>
Road maintenance and road asset management	<p>Effective covenants on maintenance of Asian Development Bank-funded road sections</p> <p>Support for sector-level improvements in asset management systems and funding, with support continuing long enough to yield results</p> <p>Knowledge sharing and collaboration across developing member countries and regions</p>
Road safety	<p>Road safety audits</p> <p>Interjurisdictional road safety programs</p> <p>Collaboration with private partners such as fuel companies and vehicle manufacturers and distributors</p> <p>Use of intelligent transport systems</p> <p>Pedestrian and cycle paths</p>
Environmental impacts	<p>Roadway size minimized so that land take is minimized</p> <p>Dust minimized</p> <p>Tighter vehicle emission and fuel quality standards supported</p> <p>Inspection and maintenance schemes improved</p>
Social impacts	<p>Participatory approach to project planning and preparation</p> <p>Roadway size minimized so that land take is minimized</p> <p>Complementary development programs to realize potential opportunities created by road improvement</p> <p>Core labor standards</p> <p>Community-based road maintenance programs</p> <p>Pedestrian and cycle paths</p>

continued on next page

Appendix 2 (continued)

Appendix 2

Aspect of Sustainability	Examples of Options to Consider
Carbon dioxide emissions	Reuse of road pavement materials Vehicle standards and inspection to reduce emissions supported Policy interventions to make users pay for adverse externalities through congestion, road, or fuel pricing
Climate adaptation	Climate resilience measures within engineering design
Health impacts	HIV/AIDS protection strategies in large construction projects Measures to reduce vehicle emissions and noise
Gender dimensions	Community-based road maintenance programs Facilities and standards for roads, buses, coaches, and stations Measures to combat human trafficking
Needs of elderly and disabled	Facilities and standards for buses, coaches, and stations Approach to tariffs and subsidies

Sustainable Transport Initiative Operational Plan

Strategy 2020 sets the long-term strategic framework of the Asian Development Bank (ADB) for 2008–2020. During this period, ADB lending and technical assistance operations in Asia and the Pacific will emphasize inclusive economic growth, environmentally sustainable growth, and regional integration. The Sustainable Transport Initiative Operational Plan provides details of how ADB will update its operations in the transport sector in line with Strategy 2020. ADB will focus on creating transport systems that are accessible, safe, affordable, and environment-friendly.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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