

Cambodia

Transport Sector Assessment, Strategy,
and Road Map



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Transport Sector Assessment, Strategy, and Road Map

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Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
Tel +63 2 632 4444
Fax +63 2 636 2444
www.adb.org

For orders, please contact:
Department of External Relations
Fax +63 2 636 2648
adbpub@adb.org

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Currency Equivalents

(as of 15 November 2011)

Currency Unit	=	riel (KR)
KR1.00	=	\$0.00024
\$1.00	=	KR4,065

Abbreviations

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
ASR	–	assessment, strategy, and road map
BEC	–	Board of Engineers of Cambodia
CDRI	–	Cambodia Development Resource Institute
COBP	–	country operations business plan
CSF	–	Commune/Sangkat Fund
GMS	–	Greater Mekong Subregion
IRITWG	–	Infrastructure and Regional Integration Technical Working Group
JICA	–	Japan International Cooperation Agency
KfW	–	Kreditanstalt für Wiederaufbau (German Development Bank)
km	–	kilometer
MPWT	–	Ministry of Public Works and Transport
MRD	–	Ministry of Rural Development
NSDP	–	National Strategic Development Plan
PPP	–	public–private partnership
PRC	–	People’s Republic of China
RAMP	–	Road Asset Management Project
RCVIS	–	Road Crash and Victim Information System
RGC	–	Royal Government of Cambodia
SAPE	–	sector assistance program evaluation
TA	–	technical assistance

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This report was prepared by a team led by Shihiru Date, senior transport specialist, Southeast Asia Department (SERD), and team members Peter Brimble (senior country economist, Cambodia Resident Mission [CARM]), Peter Broch (senior transport specialist, CARM), Nida Ouk (senior project officer, CARM), and Michael O’Connell (consultant). Guidance and support was provided by Kunio Senga (director general, SERD), James Lynch (director, Transport and Communications Division, SERD), Richard Bolt (advisor, Office of the Director General, SERD), and Munawar Alam (unit head, Project Administration, SERD). The team wishes to thank the Department of External Relations and the following staff for their support in preparing and editing the report—Elizabeth Alimurung (project analyst, SERD) and Pinky Villanueva (operations assistant, SERD).

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1. The Southeast Asia Department of the Asian Development Bank (ADB) is systematically updating sector assessments, strategies, and road maps (ASRs)¹ to better harmonize program and project planning with member countries and development partners. The preparation of this transport ASR is an integral part of project planning to ensure coordination between Cambodia's priorities and those of ADB's Strategy 2020 and the ADB Sustainable Transport Initiative (ADB 2010h). This sector ASR also provided the basis for dialogue between the Royal Government of Cambodia, the ADB Transport and Communications Division, and the ADB resident mission in developing the ADB country partnership strategy for 2011–2013.

2. The ASR on Cambodia's transport sector focuses mainly on roads and railways, but also considers urban transport. The important role of airports and water ports is discussed as well. The report was developed primarily through consultations with the Ministry of Public Works and Transport (MPWT), which manages the national and provincial road networks and the railways; the Ministry of Rural Development (MRD), which manages rural roads; and development partners working in the transport sector.

¹ For this report, ASR stands for "assessment, strategy, and road map," although the "A" is often taken to represent "analysis."

Sector Assessment: Context and Strategic Issues

A. Overall Transport Sector Context

3. Cambodia currently has four drivers of growth: agriculture, tourism, manufacturing (mainly garments for export), and commercial and residential construction. With the exception of agriculture, each of these sectors suffered a severe downturn during the global financial crisis of 2008–2009, and this likely contributed to an increase in poverty (ADB 2010g). Expansion and diversification of Cambodia's drivers of growth, especially agriculture, are important development objectives for the government.
4. Efficient transport is critical for economic growth. The agriculture sector relies on road and sea transport for exports; the tourism sector relies on international air carriers and road transport; the construction sector relies on water and road transport for delivering construction materials; and industry (primarily garment manufacturing) relies on road and water transport to deliver the materials needed for manufacturing and to export finished products.
5. The two main transport subsectors in terms of passenger and freight volumes are roads and railways (Japan International Cooperation Agency [JICA] 2006). The ports, both inland (Phnom Penh) and on the coast (Sihanoukville), play an important role in the transport sector, as do the three international airports (Phnom Penh, Siem Reap, and Sihanoukville).² Rehabilitation and further development of the transport sector are being undertaken to improve access and connectivity, both domestically and subregionally, as part of the Greater Mekong Subregion (GMS) initiative, and regionally, as part of the road and rail connectivity objectives of the Association of Southeast Asian Nations (ASEAN).
6. The largest subsector is road transport. In 2007, Cambodia's road vehicles totaled 1,066,192—273,243 cars and light vehicles such as motorcycles and auto-rickshaws; 4,067 buses; 37,098 trucks; and 511 other vehicles (National Institute of Statistics 2008). Since 2007, the annual growth rate for all categories of vehicles has been an estimated 5.1%.
7. Until 2007, Cambodia's railways were in severe decline. Rehabilitation of railway infrastructure has been under way since then, and some freight rail services resumed in 2010. The rail locomotive fleet is severely diminished, with only four functioning in 2010. Additional locomotives and rolling stock will be rehabilitated or purchased as the railway is reestablished, with more units needed for the southern line than for the northern line (ADB 2006). The principal goods to be carried by rail are cement, petroleum, and containers. Rail traffic is expected to grow by 7%–12% per year to 2030, with a projected increase in locomotives from the current 4 to 30. Railways are also expected to reduce the load on the road network.

² Sihanoukville airport has been recently upgraded, but as of mid-2011, regular services have not resumed.

8. The two major water ports are Phnom Penh inland port on the Tonle Sap River, accessed via the Mekong River, and Sihanoukville seaport. Phnom Penh port, which can handle containers, also handles ships and barges transporting fuel and oil directly to Phnom Penh. Sihanoukville seaport provides access for other heavy goods that are presently transported by road, but in the future will be transported by rail. Infrastructure at both ports is currently being expanded. Since 2010, Sihanoukville has handled 1.6 million tons of cargo and Phnom Penh port has handled 0.7 million tons. In 2005, Sihanoukville port accommodated 700 vessels and Phnom Penh about 1,070 vessels, most of which were smaller barges. Container vessels accounted for 60% of vessels using Sihanoukville port, while tanker barges accounted for 65% of vessels using the Phnom Penh port. Other major cargoes are garments for export from factories centered around Phnom Penh and raw construction materials imported for domestic use. Sihanoukville port is being upgraded to handle container traffic, and a deepwater container pier and 70-hectare special economic zone are also being developed, with completion of all expected by 2015. Once rail transport is well established again, heavy and dangerous goods, such as petroleum products and container goods, will be transferred by rail.

9. The policy, legal, and regulatory framework covering the transport sector requires further strengthening. Some important advances have been made, such as the road traffic law and the law on economic concessions. But to improve the effectiveness, efficiency, and sustainability of the road system, other important policies and laws concerning roads need to be formalized. The government has identified a wide range of regulatory improvements for priority action. These are summarized in Appendix 1.

10. In accord with the National Strategic Development Plan (NSDP), the government and development partners have planned an ambitious transport sector expenditure program for 2010–2012 worth \$485.3 million (17.15% of the NSDP budget; RGC 2005). The goal of this plan (RGC 2008b), which was developed by the Infrastructure and Regional Integration Technical Working Group (IRITWG), is to support greater economic growth by improving transport infrastructure. The Minister of MPWT is the chair of IRITWG, and ADB and JICA serve as the group's co-facilitators.

11. Since the government and development partners cannot shoulder all the costs of improving transport infrastructure, including roads, railways, and both dry and water ports, private investors are required. However, to attract investors, good governance and a strong legal and regulatory framework are needed to protect investors. As a start, the government passed the Law on Concessions and it is prioritizing additional relevant legislation on private sector participation.

12. Substantial support for Cambodia's transport sector has been provided through the Greater Mekong Subregion (GMS) cooperation and integration initiative. This initiative, which is also supported by ADB's Strategy 2020, envisions an integrated, prosperous subregion based on interlinked economic corridors. The GMS Transport Sector Strategy 2006–2015 is designed to achieve this goal through a seamless network of transport services that connect the whole subregion. This multimodal³ network, which is being developed with private sector participation, is expected to give Cambodia better links and synergies across the entire GMS. Three of the nine GMS transport corridors cross Cambodia: the Southern Corridor, the Southern Coastal Corridor, and the Central Corridor. Developing these GMS transport corridors into economic corridors is expected to create needed jobs and improve incomes across rural Cambodia (ADB 2010d).

³ Means more than one mode of transport is involved.

B. Subsector Assessments

1. Road Transport

13. Cambodia's national road network comprises 2,117 kilometers (km) of paved roads connecting Cambodia to other GMS countries; in some cases, these are also part of the ASEAN highway network. The national network also includes 3,146 km of secondary roads and 6,441 km of provincial roads that are mostly unpaved (laterite). For the period 2010–2015, the joint monitoring indicator target for new national roads (both primary and secondary) is 2,580 km, with a target of 4,100 km for rehabilitated roads. Based on ADB estimates, existing and contracted primary and secondary national paved roads should total 3,400 km by 2015. A total of 33,005 km of earth or laterite-surfaced roads serve rural communities. Many are in a poor state and impassable during the 7-month wet season, despite considerable efforts to maintain these roads. To cross Cambodia's many rivers and streams, permanent bridges are also essential transport infrastructure. In 2010, Cambodia had 2,121 bridges on the national and provincial road networks, and many more on the rural network.

a. National and Provincial Roads

14. MPWT manages an infrastructure investment program that in 2010 was worth \$1.3 billion. Funded by 10 development partners, this budget is spent primarily on roads and bridges. The budget for 15 high-priority projects in the pipeline in 2010 was \$803 million, including \$500 million for a new railway link from Phnom Penh to Viet Nam (Ministry of Planning 2009). Currently, MPWT and its development partners are largely targeting secondary national roads and roads that link to other GMS countries. Improving rural road access to provincial towns is a longer-term target.

b. Rural Roads

15. The rural roads managed by MRD compose 71% of Cambodia's total road network, and most are in poor condition. Recent investments have improved some rural roads to a good standard, but roads are damaged by poor-quality local gravel used in construction, heavy rains for 7 months a year, and high traffic, making it necessary to re-gravel roads as often as every 3 years. Cambodia's high road maintenance requirements compete for budget with demands to upgrade rural roads.

16. The MRD 2009 budget for rural road development was \$241 million, and was partially funded by KfW (a German development bank) and the World Bank. MRD and related ministries also manage other aspects of rural infrastructure development (most importantly, domestic water supply). MRD's budget for investments in rural infrastructure, excluding roads, was \$923 million in the 3-year program 2010–2013, and its budget for high-priority rural road work (upgrading 7,800 km of rural roads and some 6,000 culverts and small bridges) was \$130 million (Ministry of Planning 2009).

17. Decentralization and deconcentration reforms to establish government at the commune level has been under way since 2009. Related financing from the Commune/Sangkat Fund (CSF)⁴ for public infrastructure development and repairs is intended to upgrade rural roads in order to improve rural people's access to government services and economic opportunities. Small CSF contracts (each valued at about \$10,000) are used to repair or build local roads and related infrastructure, such as culverts for cross drainage. Collectively, CSF contracts added up to \$18.6 million in 2009. Projects are tendered through

⁴ The Commune/Sangkat Fund (CSF) is a mechanism for fiscal transfers from the national government to finance the administration and development expenditures of the rural communes and urban sangkat councils. It was established in 2002.

competitive bidding, and contractors must meet technical, social, and environmental criteria in order to get paid (National Committee for Sub-national Democratic Development 2009).

18. MRD has developed a comprehensive plan for its high-priority projects and will need development partner support for both financing and institutional capacity development, so that ministry technical capacity matches that of MPWT. Both ministries also need to improve their collaboration. To improve MRD institutional capacity, funds for this have been included in an ADB loan that was approved in 2010 (ADB 2010h). MRD currently has limited experience in managing the construction or upgrading of earth or gravel-surfaced roads that are paved with bitumen. However, MRD does have designs and quality standards for paved roads that were developed under the South East Asia Community Access Program (MRD 2009). MRD's rural road designs and quality standards, like those of MPWT, are flexible in order to save money by allowing thinner pavement on roads with less traffic.

c. Regional Roads and Border Facilities

19. GMS infrastructure to improve cross-border road traffic is advancing rapidly. Now that the main GMS road links are in place and at an adequate standard, cross-border facilities have been improved at the Poipet border crossing with Thailand, and new facilities have been built to GMS standards at Bavet, on the border with Viet Nam. Construction or rehabilitation of other cross-border facilities is also in progress in southwest and southeast Cambodia.

2. Rail Transport

20. The railway originally consisted of the northern line from Phnom Penh to Poipet (386 km) on the Thai border, and the southern line from Phnom Penh to Sihanoukville (264 km). The section of the northern line to Sisophon (338 km from Phnom Penh) is in a state of disrepair, while the final section from Sisophon to Poipet (48 km) no longer exists; it was destroyed during the civil war of the 1970s, and now requires replacement. At Poipet, the northern line used to connect with the Thai railway, and the southern line connected with the Sihanoukville port. Once they are functioning again, both of Cambodia's rail lines are expected to become part of the GMS Southern Economic Corridor and help Cambodia become more competitive by offering faster and less expensive transport.

21. Although some investment was made in the late 1990s to partially rehabilitate the railways after the end of civil strife in 1998, in recent years, lack of investment has made road transport more reliable and less expensive than rail. In 2009, railway rehabilitation resumed after the Royal Railway of Cambodia was transferred to the Department of Railways under MPWT Sub-Decree No. 163. Since then, loan agreements have been made with ADB and private cofinanciers to rehabilitate rail infrastructure. A private company has been granted a 30-year concession to operate the railway, but only freight services are expected to be available.

22. In addition to reestablishing the northern and southern railway lines, rail improvements will include a 6 km branch line from Phnom Penh station to the petroleum depot on the Tonle Sap River, and a second link will be built from Sihanoukville container terminal to the city's port. A new freight and rolling stock maintenance station, big enough to meet future rail requirements, will be established at Samrong. Upgrading or strengthening selected parts of the main line will also be undertaken, along with building additional sidings and terminals to facilitate connectivity with water and road transport. At Poipet, a GMS cross-border rail facility and rail and road freight terminal are to be built. The newly established railway will unlikely provide passenger service because this would not be profitable. Also, operating passenger trains on single-track lines is challenging because passenger service requires substantially more safety features than is the case with freight trains.

23. There is interest in providing a railway from Thailand to Viet Nam, which would complete the GMS network connected with rail lines in the People's Republic of China (PRC). To achieve the link to Viet Nam, a new railway line must be built through Phnom Penh to Ho Chi Minh City. A feasibility study for this line will be finished by 2012 and private financing of \$500 million–\$600 million will be sought to pay for it. All of this proposed construction aligns with the GMS railway strategy (ADB 2010f).

3. Water and Air Transport

24. The length of navigable inland waterways in Cambodia is 1,750 km, although year-round navigation is only possible along 580 km of the Mekong River and its tributaries. Of the total navigable waterways, the principal ones are the Mekong River (30%), the Tonle Sap (15%), and the Bassac River (5%). Other Mekong tributaries account for the remaining 50% of navigable waterways. Primary use of inland waterways is for petroleum, container, and general cargo shipments. Barges operate along the Mekong River from ports in Viet Nam to Phnom Penh. Inland water transport has generally been on the decline in recent years, as cargoes were switched to road transport. Current waterway improvements include dredging to maintain the navigable length and providing safety markers. Inland water transport can offer a cheaper alternative to road transport and also improve rural access to markets. A master plan for waterborne transport on the Mekong River system was prepared in 2006 with assistance from Belgian Technical Cooperation (MPWT 2006).

25. Since the government declared an “open skies” policy, Phnom Penh, Siem Reap, and Sihanoukville airports have all been upgraded to international standards, using international loans, and the airports are all operated by the same concessionaire (Société Concessionnaire de Aéroport [SCA]). SCA improved the Sihanoukville airport through a build-operate-and-transfer scheme. The Phnom Penh and Siem Reap airports welcome 1.5 million tourists annually, whose spending represents a third of Cambodia's gross domestic product. Other tourists, about half of the total, arrive by road or sea. The other (domestic) airports are managed by the State Secretariat of Civil Aviation, but are closed or rarely receive passengers. Nevertheless, the Ministry of Planning had identified six high-priority infrastructure development projects for five of these domestic airports (Ministry of Planning 2009).

C. Core Sector Issues, Causes, and Effects

26. Cambodia's underdeveloped transport sector constrains regional integration, as well as regional and global trade, and therefore holds back economic development and poverty reduction. The strategic challenges facing the transport sector are lack of connectivity to services and markets, resulting in lost economic opportunity; high operating, maintenance, and logistics costs; lack of competitiveness; and unsafe and unsustainable infrastructure. These problems are caused by incomplete national and regional transport policies and legal and regulatory frameworks; low institutional capacity; low private sector participation; and incomplete and inefficient transport infrastructure networks, especially with regard to provincial and rural roads and railways. The poor condition of the transport network is due to a variety of factors, including low capacity for performing maintenance, vehicle overloading, heavy rain for 7 months a year, and poor traffic safety. For more details on these problems, see the “strengths, weaknesses, opportunities, and threats” analysis in Table 1.

27. Four priority problems have been identified for the transport sector in Cambodia. Generally, these apply to the road and rail subsectors, where ADB has extensive experience.

Table 1 Strengths, Weaknesses, Opportunities, and Threats Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> Recognition that the transport sector is vital for socioeconomic growth <p>Law and policy</p> <ul style="list-style-type: none"> Some MPWT and MRD policy documents drafted Road traffic law adopted Law on Concessions adopted Rail infrastructure legal requirements complete Department of Railways established Operating concessionaire appointed (30 years); rehabilitation of railway infrastructure ongoing, will relieve roads of some heavy goods due to cargo transport modal shift <p>MPWT roads</p> <ul style="list-style-type: none"> GMS and primary national roads paved, providing good access to borders and international connectivity Development partner funds attracted to develop the national network; currently, 10 development partners have projects MPWT has the capability to deliver large investment projects through its project management units Development partner funds have been secured for primary road periodic maintenance Permanent weighbridges in place at seven locations Technical specifications suitable for Cambodia using historical climate patterns Technical specifications adapted for vulnerable road users (use of road shoulders) <p>Rural roads</p> <ul style="list-style-type: none"> Government commitment for rural road infrastructure development high Rural road development to laterite standard carried out to a good standard Draft technical standards consistent with national standards prepared Government decentralization and deconcentration program gaining support with a multitude of small value contracts being enacted by small-scale contractors, improving access <p>Rail infrastructure</p> <ul style="list-style-type: none"> Investment assured and rehabilitation in progress; concession operator in place <p>Inland waterways</p> <ul style="list-style-type: none"> Mekong dredging in progress Navigation improving <p>Air transport</p> <ul style="list-style-type: none"> International airports regulated and operated privately 	<p>Law and policy</p> <ul style="list-style-type: none"> Road law not in place Draft policy documents not finalized Road traffic law on overloading not enforced <p>MPWT roads</p> <ul style="list-style-type: none"> Most secondary national network unpaved Many provincial roads unpaved (laterite) and have insufficient width Funding for further development of national roads unsure Future national funding for road network maintenance unsure Technical specifications not suitable for climate change adaptation Road safety not improving significantly <p>MRD rural roads</p> <ul style="list-style-type: none"> MRD has attracted few development partner projects Planned investments not sufficiently focused Capacity of MRD weak and does not exist for paved road development Laterite roads not suitable in many cases for traffic and climate of Cambodia; material quality low and resources for materials being depleted Gravel roads not suitable from a health perspective for populated zones (dust); earth roads even less suitable for roadside communities because of very fine soils Rural road quality not adequate to meet requirements of agriculture and other sectors Decentralization and deconcentration program for rural roads requires development partner support and strong technical management to succeed <p>Rail</p> <ul style="list-style-type: none"> Railway unlikely to support passenger traffic GMS link to Viet Nam required <p>Inland waterways</p> <ul style="list-style-type: none"> Bassac River not navigable; Tonle Sap very limited navigability Rural Tonle Sap ports not supported as alternative mode <p>Air transport</p> <ul style="list-style-type: none"> Domestic airports not sufficiently functional; there are no scheduled flights <p>Support for thematic areas</p> <ul style="list-style-type: none"> Transport sector does not adequately support poverty reduction, social development, and sustainability of the environment

continued on next page

Table 1 Continued

Opportunities	Threats
<ul style="list-style-type: none"> • Continued development partner leadership in transport sector • Infrastructure and Regional Integration Technical Working Group to assist with <ul style="list-style-type: none"> – road maintenance initiatives – prevention of vehicle overloading – improvement of road traffic safety • Promote public–private partnerships in the sector • Develop strong and sustainable transport institutions • Develop paved rural roads around semi-urban centers to link markets • Pave provincial roads • Maintain environment and social safeguard standards 	<ul style="list-style-type: none"> • Decline in economic or political stability • Sector development not supportive of development directions (e.g., agriculture and tourism) • Sector does not support diversification of socioeconomic opportunities • Policies not focused or not explained adequately • GMS bilateral agreements for road and rail traffic not completed successfully • Lack of policy inhibits development partner support • Private sector partnerships not attracted or sustained • Heavy vehicle loading regulations not enforced • Traffic safety regulations not further developed or enforced • Development partners not attracted to rural road infrastructure • Pace of urban development exceeds that of rural development • Technical requirements for international movements of trains not resolved • Inadequate or expensive transport preventing achievement of Asian Development Bank theme objectives in poverty reduction, social development, and sustainability of the environment

GMS = Greater Mekong Subregion, MPWT = Ministry of Public Works and Transport, MRD = Ministry of Rural Development.

Source: Asian Development Bank.

Sector Problem 1: Lack of Laws and Formalized Transport Policies, Incomplete GMS Border Agreements, and Low Institutional Capacity

28. Completion of the law on roads and the national transport policy, as well as related legal and regulatory frameworks, is required for efficient management of transport infrastructure. These instruments include the national policy on the transport sector, which MPWT has submitted for cabinet approval in 2009. The draft policies, laws, and regulations being prepared by MPWT include the law on river transport, an amendment to the road traffic law, the master plan on inland waterway transport, the law on transportation, the national policy and administrative management system for the ports subsector, a policy on maritime transport, a national policy and the law on ports, the master plan on waterway transport in the Mekong River system, the master plan on development of the road network, and the master plan on maritime transport and seaports. A list of priority laws, policies, legal and regulatory frameworks, and requirements for their enforcement can be found in Appendix 1.

29. In the case of road transport, with technical assistance (TA) from ADB and other development partners, both MPWT and MRD have developed supporting strategies and policies. However, these have not been approved by the cabinet. Once cabinet approval is given, greater development assistance is likely to be provided for the sector, which is essential for reaching transport development targets. One important role for development partners is helping counterparts prepare focused public investment programs.

30. Through TA and loan implementation support, capacity-building targets have been attained; in general though, these targets have not been sustainable due to the relatively short duration of projects and loans, the low number of staff trained, and the low retention of staff after training. As a result,

institutions are not developing the capacity to operate without international support. The solution is institutionalizing the training and certification process so that individuals gain the qualifications they need to advance professionally. The Board of Engineers of Cambodia (BEC) was recently formed to register graduate engineers and to assist them gain internationally recognized qualifications such as ASEAN's certification for engineers (BEC 2009). The newly formed BEC requires support in defining its identity in relation to similar international entities. It also requires support for training professional trainers and effectively using technical training institutions. The establishment of BEC and the certification of its members as internationally qualified professional engineers should strengthen the capacity of local firms that hire BEC members, and also help these firms attract international partners for large ventures.

31. The private sector, both contractors and consultants, also requires support from a professional body. If private operators form their own associations, they will be able to lobby collectively about shared concerns and provide government with feedback on proposed policies, laws, and regulations.

32. The Law on Concessions was approved by the Senate in October 2007. Other laws and regulations to support Cambodia's private sector have been put in place and more are planned. To accelerate development of the transport sector, it is also essential that additional regulations to protect investors are implemented in order to attract private financing for projects such as the railway to Viet Nam.

Sector Problem 2: Lack of Transport Infrastructure and Efficiency in Roads and Railways, and Lack of Urban Public Transport Services

a. Paved Roads

33. The primary reason for high road transportation costs in Cambodia is the lack of paved roads. Laterite-surfaced gravel roads lack durability and are often impassable in the wet season. In a report by the Infrastructure and Regional Integration Technical Working Group (2009), the percentage of paved roads was listed as 99.1% for Cambodia's primary national network, 30.2% for the secondary national network, 1.7% for provincial roads, and 0.3% for rural roads. Also, 99% of primary national roads have at least two traffic lanes, but only 52% of secondary roads and 15% of provincial roads have two lanes. Widening will be required to improve the safety and efficiency of these roads, but before widening can take place, people living close to the roads will have to be resettled. As of 2010, 10.0% of Cambodia's roads were paved, an increase from 6.5% in 1995. Cambodia's percentage of paved roads remains much lower than in neighboring countries such as Thailand (98%) and Viet Nam (25%) (ADB 2009b, CDRI 2009). Clusters of developed roads are required to support semi-urban development, agriculture and agro-enterprise development, and GMS towns.

34. A rough cost estimate for paving the unpaved national and provincial road network, and 30% of the rural road network, is \$3 billion (consultant's estimate). The cost of completing the railway link to Viet Nam is an estimated \$0.5 billion, which would establish the planned GMS rail link. Public sector participation in constructing the rail line to Viet Nam is likely, but probably with significant private financing as well. A "first concept" cost for a north-south rail link is \$1.6 billion. With costs of such magnitude, clear policies are urgently needed to establish development priorities based on the road law and to attract substantial private sector participation. The government and its development partners will undertake additional road development, which should target paving selected rural roads in order to enhance their connectivity. It will be essential as well for private sector entities to undertake other large-scale projects largely or entirely on their own; one example is the north-south rail link, which will become crucial for shipping ore if mineral exploration in northern provinces leads to successful mining ventures.

35. Cambodia's transportation costs remain high due to inadequate and inefficient transport infrastructure and services. The transport cost estimated by the Cambodia Development Resource Institute (CDRI 2009), was \$10.00 per ton/100 km. Using World Bank 2009 figures, CDRI updated this estimate in 2009 to \$15.00 per ton/100 km. Transport costs in neighboring Thailand and Viet Nam are far lower—\$4.00 per ton/100 km and \$7.50 per ton/100 km, respectively (CDRI 2009). This shows that expected transport cost reductions have yet to be realized in Cambodia. Without undertaking a formal analysis, Cambodia's transport costs appear to have declined only on upgraded links. This is understandable, given that only primary roads have been paved. A significant reduction in transport costs will only be achieved when more secondary, provincial, and rural roads are paved. Lack of connectivity of roads is another serious transport challenge, especially in rural areas. This results in low “farm-gate” prices because bulk purchasers have to recoup their high transport costs by paying farmers less. Clearly, high transport costs affect all aspects of life for the rural poor, with too much of their limited income spent on transportation-related costs rather than on other essential needs.

36. Although development of the primary national road network is almost complete at the national and subregional levels, the paving of the secondary or provincial network is progressing slowly. At the same time, the rural road network is deteriorating as rapidly as it is being built. The primary and secondary networks provide the foundation for reducing poverty, but unfortunately these roads have yet to reach and benefit the rural poor. In order to raise rural incomes, rural roads must be improved so farmers and value-adding rural agro-enterprises can transport their produce and products to the market and ensure shipments arrive on time and undamaged.⁵

b. Subregional Transport Efficiency

37. Progress in implementing GMS initiatives is essential in order to realize the benefits of improved transport infrastructure in Cambodia. The first essential step is signing, ratifying, and depositing the GMS trade and transport and cross-border transport agreements—a total of 17 annexes and 3 protocols.⁶ The January 2009 IRITWG report states that Cambodia has signed and ratified all 20 of the GMS documents, but only 12 have been deposited.

38. For the movement of trains internationally on the newly established railway, a cross-border bilateral agreement with Thailand is required. Other than that, the main obstacle for subregional train movements is technical. Although most GMS countries use meter-gauge track, the PRC operates on the wider, standard-gauge track. The obvious route for a rail link to the PRC is through Viet Nam. Some sections of the northern railway in Viet Nam already link to the PRC with dual-gauge rail track, which allows narrower gauge trains to run on wider PRC track. Other challenges, such as differing heights when coupling train cars, have to be overcome, but all these problems have solutions. For road vehicles, the problem is the switch from right-hand drive in Thailand to left-hand drive in Cambodia, Viet Nam, and other countries.

c. Urban Transport

39. In Phnom Penh, public buses are nonexistent. Instead, people use their own vehicles or hire a *mototaxi*, *tuk-tuk*, or meter-taxi. Few traffic control systems are in place and driver behavior is erratic.

⁵ Addressing needs in the agriculture sector is the subject of another ADB sector assessment, strategy, and road map (ADB 2010a). In that agriculture sector ASR, the importance of providing good rural roads and other infrastructure is stressed, and needs are consistent with those described in this report.

⁶ “Depositing” is a process whereby a government informs GMS member countries about protocols or annexes and when they are ready to be implemented.

Lack of understanding and enforcement of traffic laws poses a grave risk to all road users and pedestrians. In 2001, JICA prepared a transport master plan for the Phnom Penh metropolitan area. Traffic problems identified in this plan include an incomplete road network; traffic congestion on arterial roads; lack of access to developing residential, industrial, and commercial areas; inefficient public transport; chaotic and mixed-traffic flows and a high level of traffic accidents. Urban development is essential for Cambodia's economic development, and efficient urban transport infrastructure and services are essential for urban development (ADB 2010e).

40. In recent years, installation of traffic signals and improvements to the layout of some major intersections have improved safety and alleviated congestion. JICA's master plan for Phnom Penh is currently being updated under a new technical assistance project that began in late 2010.

41. The transport system in Cambodia is not multimodal or integrated. Changing over to a multimodal urbanized transport system is essential in order to lower transport costs and attract competition in services. The lack of rail services, limited inland waterway services, and limited docking facilities—especially for container ships—all contribute to high transportation costs.

Sector Problem 3: Lack of Sustainability through Low Maintenance Capability, Vehicle Overloading, Poor Traffic Safety, and Lack of Climate Change Resilience

42. As already stated, road maintenance funding is insufficient, overloaded vehicles are damaging the road network, road safety is severely lacking, and transport infrastructure is threatened by the effects of natural disasters due to climate change. Lack of investment in water and rail transport and a falloff in their use due to improved roads threatens Cambodia with the loss of affordable alternatives and competition in the transport sector.

a. Road Maintenance

43. Historically, the provincial departments of MPWT have undertaken road maintenance. Recognition of road maintenance needs is a recent phenomenon. Formerly, very small annual budgets were allocated but have grown considerably to \$33 million (2008), and the government has committed to increasing maintenance funding by 5.5% per year (ADB 2009c). Although a road fund was seen as an appropriate mechanism to ensure annual funding, the government preferred to allocate funding from central government sources. To raise financing for road development and maintenance, a surcharge on fuel of \$0.02 per liter of diesel and \$0.04 per liter of gasoline was introduced in 2000. An interministerial road maintenance committee manages allocation of this fund. Members of the committee are from the Ministry of Economy and Finance, MPWT, and the private sector. MRD should also become a member of the committee. The Road Asset Management Project (RAMP), cofinanced by ADB and its partners, Australia and the World Bank, is positioned to significantly improve the maintenance of the national road network, and importantly, all work will be done by private contractors.

b. Vehicle Overloading

44. Vehicle overloading damages roads and is a widespread problem in Cambodia. The worst abusers apply the equivalent of 50 heavy vehicle passes for the passage of one vehicle, while the legal loading limit is the equivalent of 3 or 4 heavy vehicle passes. Thus, road engineers must either compensate for this overloading when designing roads, which leads to much thicker and more expensive road pavements than otherwise necessary, or the road structure becomes damaged in a fraction of the time expected. The road traffic law has been passed, which defines loading limits and also permits authorities to punish offenders. Six permanent weighbridge stations have been operating on major roads in the country since

March 2011. The rural road network is severely at risk, especially where technical and economic necessity requires the paving and sealing of some roads with bitumen. Once paved, defects and destruction of the road cannot be simply (or inexpensively) “graded-out” periodically; a damaged bitumen road must be torn up and rebuilt. Rural roads are at risk because many overloaded vehicles begin their journey on the rural network (for example, carrying stone from quarries). Regulation and axle load control and enforcement are essential on the rural network. To achieve overloading control on national roads, the government has established the Working Group on Overloading Control and Management (2007).

c. Traffic Safety

45. Traffic safety has deteriorated severely in recent years and Cambodia now has the worst road traffic accident rate in Southeast Asia, at 15.1 per 10,000 registered vehicles (1,638 fatalities) per year. Although this represents a decline from 17.8 accidents per 10,000 registered vehicles in 2007, it is still more than twice the national target of 7.0 for 2010, and far from the 2020 target of 2.0. Human error accounted for 98% of the accidents, and motorcycle users accounted for the 77% of the casualties and 68% of the fatalities. Most motorcycle accidents were in Phnom Penh. The two leading causes of fatalities were speeding (51%) and alcohol abuse (18%). A disproportionately large number of victims are working-age males (on average, age 28), which makes their loss economically damaging as well as tragic. The traffic safety problem is being addressed by the National Road Safety Committee with its 15-point National Road Safety Action Plan, supported by information collected and reported under the Road Crash and Victim Information System (RCVIS 2009). Following the introduction of the road traffic law in January 2009, motorcycle drivers have been required to wear helmets, and this is being enforced in Phnom Penh. The RCVIS report advocates a series of measures to force a reduction in accidents which is in line with the World Health Organization’s “safe systems” approach. These include (among many other steps) enforcement of speeding, drinking and driving, and helmet laws. Through further legislation, motorcycle passengers will have to wear crash helmets and right-hand drive vehicles will be banned. The RCVIS can also report on accident “black spots” (places where multiple accidents occur) through the use of global positioning units.

46. Help in improving motorcycle safety can be sought from major motorcycle manufacturers and retailers by asking them to market only brightly colored machines and to install safety features such as lights that are permanently on. The government and police are responsible for ensuring that owners have licenses and that registration and insurance documents are in order.

47. Trains have suffered frequent derailments. These are lower now only because the southern line services have been terminated and the northern line is down to one joint freight and passenger train per week. Attention to safety at road crossings and use of signaling will be important when train services resume, especially because trains will be operating at a higher speed (50 km/hour) than before. For many years, the poor condition of rail infrastructure has reduced speeds to about 15 km/hour.

d. Climate Change Adaptation

48. Even the primary road network is threatened by climate change. Changes in rainfall patterns—particularly wetter conditions with greater flows and higher water levels in catchment areas—can damage road and rail transport infrastructure. Higher moisture levels in soils make roads weaker, and with heavy rains, the capacity of cross-drainage structures and bridges may be exceeded, leading to flooding, impassability, and expensive repairs. Changes in land use and poor land management can increase erosion. For climate adaptation to be successful, a firm technical basis is required. The engineering community requires design guidelines and technical specifications to justify what may otherwise be seen as an unwarranted increase in structural dimensions and cost. The problem requires a centralized solution through adaptation of design manuals and technical specifications to achieve better use of more

durable natural or processed materials, even though there appear to be cheaper alternatives. With regard to future climate change trends, the historical rainfall records used for hydrological design parameters and methods may not be appropriate for weather conditions that are expected to change significantly in the future.

49. Coastal infrastructure faces rising sea levels that will inundate land. Koh Kong is particularly at risk because rising sea levels will cover parts of the city.

Sector Problem 4: Attraction and Retention of Private Finance

50. Private finance has an important role in the development of transport infrastructure. Important goals, such as the extension of the railway to Viet Nam, may be beyond the current borrowing capacity of the government. To attract private investment, further regulation and transparency are required. It is also important to continue current concessions, such as that of the existing railway, as well as to support the newly established Department of Railways at MPWT.

51. A strong contender for private sector participation is the expansion of dry ports and maritime ports to facilitate multimodal transport. Toll roads will unlikely be of interest to private investors because traffic volumes are too low to warrant investment. Alternative approaches, such as public investment in road infrastructure and private sector operation of toll collection, are possible, and would have the advantage of generating fees for the government.

52. Cambodia in recent years has improved the legal environment to facilitate formal private sector development. ADB's country operations business plan (COBP) 2009–2012 (ADB 2009a) lists important laws and regulations that have been introduced. These include (i) the Law on Commercial Enterprises (2005), the Law on Commercial Arbitration (2006), the Law on Customs (2007) and many related regulations, the Law on Secured Transactions (2007), the Law on Concessions (2007) governing public–private partnerships (PPPs) in infrastructure, the Law on Insolvency (2008), and other regulatory reforms such as streamlined business registration procedures and decentralization of registration to the provincial level; (ii) an increase in the number of registered businesses from around 1,700 in 2006 to 2,886 in 2008; (iii) initial implementation of the Automated System for Customs Data in May 2008 at the port of Sihanoukville and further rollout at the Phnom Penh International Airport in late 2009; (iv) the 2007 Diagnostic for the Trade Integration Strategy that reviewed key trade-related policies and developed a sector-wide approach that addresses issues in three strategic pillars (reforms and cross-cutting issues for trade development, export development, and capacity building for trade development); (v) the Government–Private Sector Forum, an ongoing mechanism set up for public and private sector consultation on investment climate and business environment issues (ranging from policy to day-to-day operations), which has received high marks for its organizational effectiveness and impact on the reform process and private sector development alike; (vi) establishment of several special economic zones; and (vii) establishment of the Institute of Standards of Cambodia in 2008.

A. Government Sector Strategy and Plans

53. The government's national strategy for growth is set out in the Rectangular Strategy Phase II (RGC 2008a). It builds on the original Rectangular Strategy; emphasizes the need for growth, employment, equity, and efficiency; and forms the socioeconomic policy agenda of the political platform of the government in the fourth legislature of the National Assembly. The primary document to guide government is the *NSDP Update 2009–2013* (RGC 2009), which was adopted at the midterm review in 2008 for the period to 2013 to match the term of the fourth legislative period (RGC 2008b).

54. The *NSDP Update* noted that development efforts had contributed to reduced poverty levels from 34.7% in 2004 to 30.1% in 2007, according to estimates based on the latest Cambodia socioeconomic survey (2007). The poverty rate reduction is approximately 1% per year. The document also acknowledges the potential impact of the 2008–2009 global crisis on Cambodia's economy, which was likely to set back poverty reduction.

55. In the Rectangular Strategy Phase II, the role of the transport sector was clearly defined. It emphasized that although progress had been made, further rehabilitation and construction of transport infrastructure was essential. This is because in the current context of Cambodia, the transport network acts as a prime mover of economic growth, as arteries linking all parts of Cambodia into a cohesive economic body provide the means to integrate Cambodia's economy into the region and the world. The strategy prioritizes the rehabilitation and reconstruction of a multimodal transport network connecting all parts of the country and neighboring countries. This will enable provision of convenient, stable, safe, economically efficient, lower cost transportation and logistics services, aimed at fostering trade, tourism promotion, rural development, regional and global economic integration, and national defense.

56. Finally, the *NSDP Update* stated that rural infrastructure (construction, improvement, and maintenance) was vital for rural progress, to take services and inputs to the interior, and to improve market access to outputs from the interior. In 2006 and 2007, 1,030 km of new roads were constructed; 1,604 km of rural roads were repaired; 3,761 km of rural roads were regularly maintained; and 96 small bridges and 726 culverts were built. MRD now estimates that the rural network has increased from 28,000 km to 32,318 km.

57. The government has made progress in developing PPPs, notably operations for three international airports, one primary national road (NR4), and the operation of the railway. In all, 36 public–private schemes are listed by MPWT as in various states of consideration, with 12 that are active.

58. The Law on Concessions⁷ was approved by the Senate in October 2007. To accelerate the development of the transport sector, it is essential that further regulations are put in place to convince

⁷ The Council for the Development of Cambodia. 2007. Law on Concessions.

potential private sector entities to contribute to infrastructure development. A very important example would be in developing the railway to Viet Nam.

59. In addition, innovative schemes, such as contracts for building and maintenance for long periods—say, 15 years (longer than the implementation of loans)—could be considered. This would lead to large national contractors delegating smaller contracts for long-term maintenance to local contractors, including those contractors that are eligible for decentralization and deconcentration contracts.

B. ADB Sector Support Program and Experience

60. ADB's overarching goal in Cambodia remains sustainable poverty reduction as set out in the CSP (2005–2009) and confirmed in the country partnership strategy, 2011–2013. The poverty situation is set out in a country partnership thematic assessment for 2011–2013 (ADB 2010c). In line with the priorities and strategies identified in the government's Rectangular Strategy, the current country partnership strategy focuses on broad-based economic growth through investments in physical infrastructure, support for greater regional integration, decentralization and deconcentration initiatives to strengthen local participation in government, and improvements in public service delivery. To ensure broad-based and inclusive development, the focus is on the geographic area of the Tonle Sap basin and subregional aspects (GMS). This approach supports one of the poorest and most environmentally sensitive regions of Cambodia and leads to benefits from the broader opportunities provided by the GMS program.

61. The COBP (ADB 2009a) recognized that economic growth was projected to decline from an average of 10.2% between 2004 and 2008 to –1.5% in 2009 because of the global economic crisis. It reported an expected modest recovery in 2010 to 3.5%.

62. A midterm review of the CSP 2005–2009 in 2007 concluded that a sharper focus was required on rural development and private sector growth (as well as on agriculture and an intensification of risk management). This focus was consistent with the Rectangular Strategy Phase II and the NSDP 2006–2010. The COBP reflects ADB's intention of undertaking fewer but larger projects and programs than in the past, and these would be better sequenced and integrated across sectors. Transport sector projects include the 2009 GMS Cambodia Northwest Provincial Road Improvement Project to improve connectivity within the region and externally around the border areas of Thailand, with the provision of cross-border facilities (at O'smach). The ADB program also included two rural road improvement projects for 2010 (already approved) and 2013, respectively. The projects extend and maintain the connecting rural roads network to improve access to markets and social services for the rural poor. A Provincial Road Improvement Project is planned for approval in 2011.

63. A sector assistance program evaluation (SAPE) (ADB 2009c) was completed in September 2009. The evaluation period was 1998–2008. During this period, assistance from ADB to the transport sector consisted of six ADB loan projects (Table 2, items 2–7), four grant projects financed by bilateral donors, and 13 TA operations, for a total of \$235 million (24% of the total assistance program). Table 2 shows all the loans, including the rehabilitation of Siem Reap Airport (which was carried out before the SAPE period), a recent loan (item 8), and planned loans given in the COBP 2009–2012.

64. ADB also administered a grant-funded project (Grant No. 9048: Mainstreaming Labor-Based Road Maintenance to the National Roads Network Project) and administered other development partner funding in support of the projects listed in Table 2.

65. Items 12 and 13 in Table 2 are loans provided by ADB to the rural development sector, largely to improve rural road infrastructure.

Table 2 ADB Loans to the Transport Sector in Cambodia, 1998–2008

Item	Loan No.	Loan Title	Year Approved	Current Status
1	1503	Siem Reap Airport	1996	Closed
2	2288	GMS: Rehabilitation of the Railway in Cambodia	2006	Active
3	1659	GMS: Phnom Penh to Ho Chi Minh City Highway (Regional)	1998	Closed
4	1697	Primary Roads Restoration	1999	Closed
5	1945	GMS: Cambodia Road Improvement	2002	Active
6	2373	GMS: Southern Coastal Corridor (Regional)	2007	Active
7	2406	Road Asset Management Project	2008	Active
8	2539	GMS Northwest Provincial Road Improvement Project	2009	Active
9	2602	GMS: Rehabilitation of the Railway in Cambodia – supplementary	2009	Active
10	2670	Rural Roads Improvement Project	2010	Active
11	TBD	Provincial Roads Improvement Project	Pre-TA	Pre-TA
12	1824	Emergency Flood Rehabilitation Project	2000	Closed
13	1385	Rural Infrastructure Improvement Project	1995	Closed

ADB = Asian Development Bank, GMS = Greater Mekong Subregion, TA = technical assistance.

Sources: ADB sector assistance program evaluation (transport, 2009) and Ministry of Rural Development.

66. Project completion reports rated road projects to be satisfactory and the project performance evaluation reports rated loans 1659 and 1697 *successful*. Benefits were lower than expected for National Road 1 (item 3); traffic growth was low because a major bridge project was needed at Neak Loeung. This bridge is now being built with financing from JICA.

67. Overall, the sector assistance program evaluation and project completion reports concluded that ADB has substantially contributed to improvements in Cambodia's transport sector. Progress had been made on increasing transport efficiency by reducing vehicle operating costs, reducing travel time, and enhancing robust economic growth. Also, TA projects contributed to improved transport planning and policy directly aimed at improving efficiency and resource allocation, although it is noted that the policies remain as drafts.

68. Improved sustainability of the transport sector was achieved through the work to introduce a sustainable road asset management project (Table 2, item 7), which uses contractors instead of government implementation. Improved rural access was achieved in four provinces in northwestern Cambodia by upgrading 50 bridges along two provincial roads (Table 2, item 5), and in one province in southeastern Cambodia by rehabilitating about 100 km of provincial roads.

69. Traffic safety is being addressed through an improvement to the regulatory environment and through loan funding to support the government's National Road Safety Action Plan. Enforcement of the law is now essential.

70. The key issue raised by the SAPE was that the subsectoral focus of ADB's transport sector strategies and programs needs to be sharpened. The SAPE suggested (i) shifting the focus from the national roads to rehabilitating the provincial road network, (ii) developing a future strategy for the railway subsector (footnote 4), and (iii) considering shifting the focus toward areas where ADB could have a high impact, such as road traffic safety, urban transport, and transport service delivery. Other important findings were that the ADB transport sector road map should be revised and that resettlement management was an issue. However, it was also noted that coordination was improving between the Interministerial Resettlement Committee and MPWT, such that safeguard issues were likely to be addressed in a more timely manner in the future.

71. The key lessons learned from the SAPE and project completion reports were that laws, frameworks, and policies in transport are essential for effective sector development and must be established. Sustainability can only be obtained by dealing with the lack of maintenance funding and the issue of widespread vehicle overloading. Road safety has deteriorated and this must be redressed. Capacity building was effective but it was difficult to retain staff.

C. Other Development Partner Support

72. Support for the transport sector was received from other development partners for the period 1992–2009 (ADB 2009b). Thirteen sources of multilateral and bilateral funds are listed in Table 3, totaling approximately \$647 million. Nine of these have supported transport infrastructure development or maintenance over the last 10 years. The projects include one project for ferry rehabilitation. The public investment program for 2010–2012 lists 10 development partners, including ADB, engaged in ongoing projects. There were 28 capital investment projects, of which 19 were road projects, four were major bridge projects, three were port projects, and two were other projects (the Siem Reap sewage system and the GMS Mekong Tourism Development Project). Other development partners have been engaged in support of the rural road network. Commonly, these projects repaired or rehabilitated the roads to earth or laterite standard. Sometimes the works included routine maintenance of the rural roads. Many projects were implemented using labor-based methods. The projects usually involved selected lengths

Table 3 Development Partner Support for Subsectors

Subsector/ Issues	Subcategories	Development Partners		Implications for ADB Support
		Recent	Current	
National and provincial roads	Master plan		JICA	Essential
	Investment		ADB, Australia, PRC, Republic of Korea, Kuwait, OPEC, Thailand, Viet Nam, and World Bank	Further investment support on Road Asset Management Project (RAMP2)
Major bridges	Investment		PRC, JICA, Viet Nam	none
Rural roads	Policy	DFID	ADB (planned)	Strong support required for policy and paving of selected rural roads
	Investment	IFAD, ILO/Sida, WFP	KfW, World Bank	
Railways	Investment		ADB, France, Malaysia, OPEC	Facilitate operation of existing rail and extension of the railway to Viet Nam
	Operation		Private sector	
Inland waterways	Master plan	Belgium		To be considered for Tonle Sap transport of agricultural goods/others
	Investment			
Maritime ports	Master plan	JICA	PRC	none
	Investment			
Airports	International		Private sector	none
	Domestic			
Urban	Master plan (Phnom Penh) Investment	JICA	JICA (planned)	Initiate Phnom Penh Transport Authority

ADB = Asian Development Bank, DFID = Department for International Development of the United Kingdom, IFAD = International Fund for Agricultural Development, ILO = International Labour Organization, JICA = Japan International Cooperation Agency, OPEC = Organization of the Petroleum Exporting Countries, PRC = People's Republic of China, Sida = Swedish International Development Cooperation Agency, WFP = World Food Programme.

Source: ADB.

of roads in many provinces, ranging from 4 to 18 provinces for an individual project. Often the projects involved other aspects of rural development. Currently, the rural roads sector has two active development partners apart from ADB, KfW, and the World Bank. Further details on the projects are in Appendix 2.

D. ADB Sector Forward Strategy⁸

73. The overall forward strategy is to link transport infrastructure development more systematically to growth sectors, such as agriculture, and to reach out to the rural poor by providing good transport infrastructure on the rural and provincial road network, such that markets and services are accessible and low cost. ADB's strengths in the transport sector (road and rail, national and GMS) must be sustained to ensure that environmental and social safeguard standards are maintained and that capacity building is done through permanent institutions. Fewer but larger integrated projects are required, using the skills of the individual line ministries to achieve the benefits. Development partners must be attracted to contribute to the program. Meanwhile, the private sector must be further engaged to maintain and then accelerate the development of transport infrastructure. The current investment projects and those in the pipeline are substantial and correctly directed toward rural and provincial road improvement. A second national road asset management project will be required to develop the private sector maintenance program further before it can be wholly financed from government resources.

74. The COBP for 2009–2012 lists two investment projects to improve rural roads and another project to improve provincial roads. The first of the two planned investment projects includes a package to identify and select roads for the second project through the loan itself. This will ensure that the second loan does not require separate TA and that the program of paving selected roads can roll over from the first loan to the second without a break. If the second project is of a similar magnitude to the first, a further 500 km of rural roads will be paved.

75. The provincial roads project is needed to improve connectivity between provincial centers and is vital in allowing more of the country to participate in economic and social development.

76. The geographical focus of ADB will be on the Tonle Sap region for the development of rural roads. The focus can extend to two other geographic areas in sequence to relieve regional disparities. Beyond the Tonle Sap region, the roads in the plains region need improvement, encompassing the provinces of Kandal, Kampong Cham, Prey Veng, Svay Rieng, and Takeo. This approach builds on the ongoing Rural Roads Improvement Project, beginning in 2011, where some roads in Kampong Cham have been selected for paving. The reason for this need, as described in the ADB poverty analysis (ADB 2010c), is that while the Tonle Sap region contains 1.8 million poor people (38% of the country's total poor in 2004), a further 1.7 million persons in the plains region are poor (36% of the total poor).⁹ The total populations are 4.1 million in the Tonle Sap region and 5.2 million in the plains region. The second geographic expansion needed is to the plateau and mountain regions, where 0.9 million are poor (19% of the total poor) in a total population of 1.8 million.

77. By enhancing connectivity, rural road improvement supports development of other sectors in the Tonle Sap region and provides a further impetus for poverty reduction in other areas. Rural roads can be upgraded at a third of the cost of national roads, providing a cost-effective way for achieving connectivity, lowering transport costs, and reducing poverty. As in the planned Rural Roads Improvement Project, the upgraded roads should link the existing national paved roads to agricultural areas and towns.

⁸ The strategy presented here is for discussion purposes only and represents no commitment on behalf of ADB or its clients.

⁹ Country partnership strategy retreat (June 2010).

78. In terms of GMS infrastructure, the role of ADB is to implement the currently planned rail improvements and dry ports for road and rail movements. Complementary activities are needed to complete the GMS cross-border facilities and to facilitate the completion of bilateral agreements for road and for rail to achieve the objectives of the GMS Cross-Border Transport Agreement.

79. Feasibility studies are being undertaken by the PRC to establish a new rail line to the Viet Nam border and onward to Ho Chi Minh City. This will complete the rail link from Malaysia through Cambodia, and from Viet Nam to Kunming in the PRC. The role of ADB is to facilitate attracting and retaining private sector participation by assisting government prepare the necessary regulatory frameworks.

80. As noted in the Cambodia urban ASR (ADB 2010e), cities and towns create economic opportunities for growth. It is important that both rural and provincial roads connect to these growth centers. There is a strong argument that improvements to provincial and national roads that upgrade the road to the paved standard should include spur or radial rural roads to provide this connectivity. Thus, a more focused and integrated approach should be taken in selecting roads for improvement. The establishment of towns in the GMS will also be an important factor in determining road paving priorities. Formal policies of MPWT and MRD are required to ensure that priorities are set and retained.

81. Given ADB's extensive operational experience in the transport sector in Cambodia, reinstatement of ADB as co-facilitator position in the IRITWG is being requested, with MPWT and JICA support. Issues to be addressed in the IRITWG include portfolio management issues, programming issues, strategy and policy issues, and technical issues.

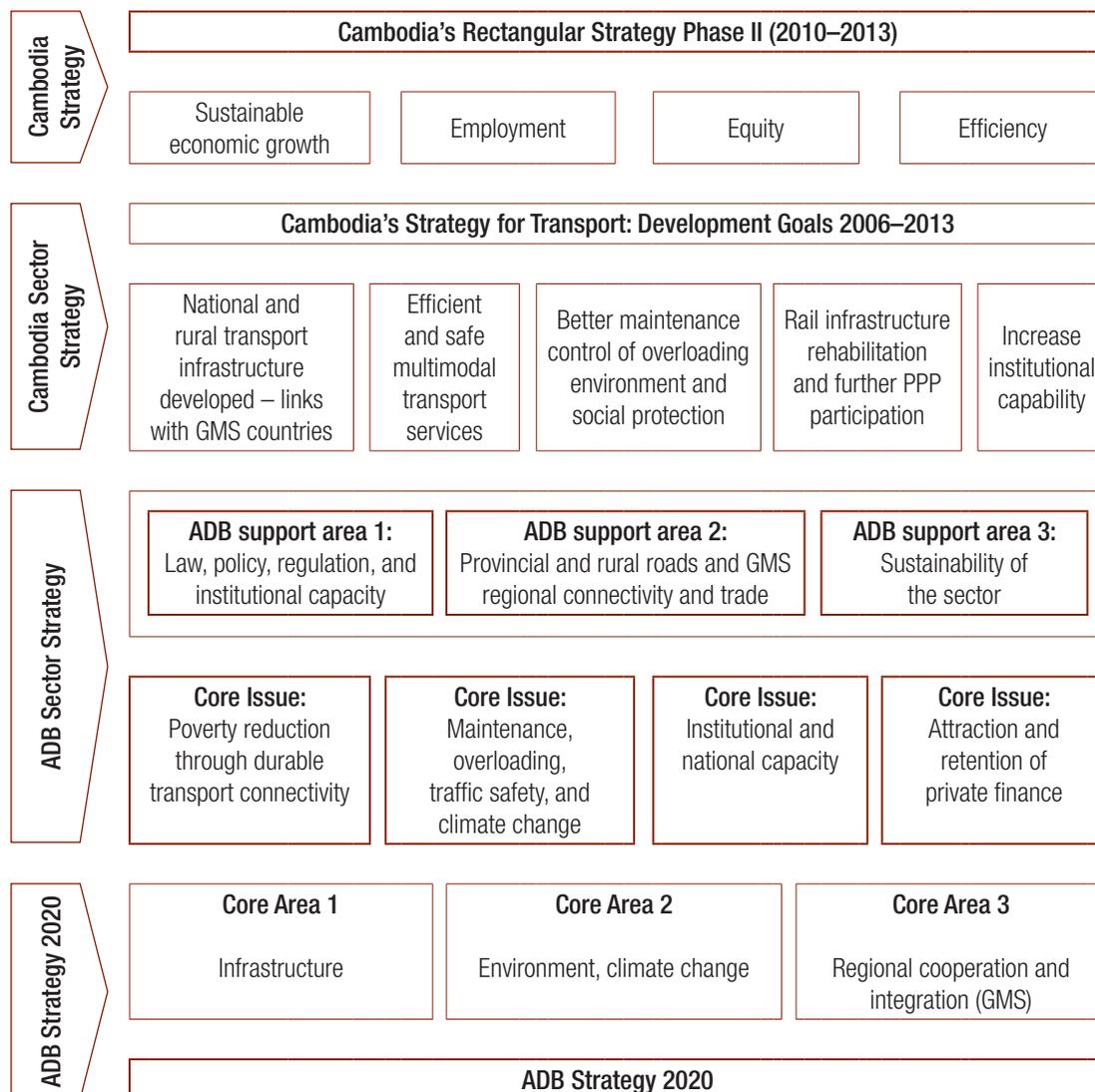
82. In the transport sector, ADB interventions aim to increase women's access to social benefits resulting from improved transport services, including better access to health and education services and to markets and trading opportunities (ADB 2010b). The gender-related benefits from the two provincial road improvement projects and the rural roads improvement project will include (i) better opportunities for women's employment in civil works as well as in rural road maintenance; (ii) increased awareness about and prevention of HIV/AIDS and the trafficking of girls and women; (iii) increased awareness of road safety and reduction of accidents, focusing on local populations, including women and children; (iv) increased opportunities for women to participate in climate change initiatives, including emergency management; and (v) gender-sensitive resettlement plans so that women in affected households secure improved access to compensation and livelihood activities.

83. Knowledge products and services, through technical assistance support and dialogue, will be required to (i) complete the strategies and policies, (ii) develop the concepts for a transport authority in Phnom Penh and for the provision of an urban transport system, (iii) determine the relative costs of different modes of transport nationally in order to assist in prioritizing public sector investments and identifying private sector opportunities, (iv) complete the outstanding cross-border transport agreement provisions, (v) provide capacity building in road asset management and for the development of technical guides and standards to address climate change, (vi) prepare feasibility studies to enable targeting of provincial and rural roads in various provinces for investment in order to upgrade roads to the paved road standard, and (vii) provide support for implementation of ongoing railway projects and for possible new rail infrastructure. Although the above items address some sustainability issues, further support for road safety and enforcement of overloading regulations will also be required.

1. Expected Results

84. The strategic linkages, showing three support areas for ADB, are shown in Figure 1.

Figure 1 Strategic Linkages



ADB = Asian Development Bank, GMS = Greater Mekong Subregion, PPP = public–private partnership.

Source: ADB.

Support Area 1: Law, Policy, Regulation, and Institutional Capacity

85. The road law defines responsibilities and establishes a framework for managing road networks, allocating resources, and regulating the services of transport providers. Because the road law is incomplete for rural roads, the right of way cannot be defined for the entire road network of Cambodia. To maintain a balanced focus on national needs, the road law and the policies and plans of both MPWT and MRD need to be finalized and formalized. This will allow development partners to identify Cambodia's needs as set out in its strategies and policies and to contribute consistently to the NSDP.

86. Funding of approximately \$3 billion will be required to (i) complete the paving of the secondary national road network, (ii) begin and substantially complete paving of the provincial network, and (iii) pave 30% of the rural network.

87. Formalizing the road law and the policies and plans of MPWT and MRD will also permit identification of suitable projects for a PPP approach. The Concession Law goes a considerable way toward creating transparency in the PPP process. However, model sub-decrees should be prepared for high-profile projects to show the private sector the type of agreements preferred by the government. Existing and planned PPPs should be publicized—on a website, for example—to create further transparency in the system.

88. The decentralization and deconcentration policy with respect to rural road infrastructure should be further supported to attract development partner funding and create long-term private sector opportunities in maintaining rural and provincial roads. The technical capacity of the provincial departments of MRD and MWPT should be strengthened to provide consistent quality in the works identified for construction and to assure that completion requirements are met. Environmental and social safeguards for these small contracts must also be strengthened and sustained.

89. The staff of MPWT and MRD, and their provincial departments, require further training, some of which may be achieved by seconding staff from one ministry to the other. Contractors and consulting engineers also require training and experience to achieve professionally recognized national and international standards. Professional associations are also needed. In this regard, the newly established BEC requires financial support and training of trainers.

90. The city of Phnom Penh needs a transport authority to guide its development and expand economic opportunities, including an expanded tourism component. The authority would become a model for transport development in other cities and major towns in Cambodia.

91. **Outcome:** Greater capability within the public and private sectors, with a significant number of professional engineers and planners capable of managing transport sector investments.

92. **Outputs:** A register of professionally trained Cambodian engineers and contractors and establishment of related professional associations. Also, a capacity development technical assistance project has been planned for strengthening the institutional capacity of MPWT.

Support Area 2: Provincial and Rural Roads and Greater Mekong Subregion Regional Connectivity and Trade

93. National development strategies clearly define the role of the transport sector, emphasizing that although progress had been made in paving most national roads, further rehabilitation and construction of transport infrastructure are essential. This strategic approach applies to rural infrastructure and regional and subregional connections as well, since all of these networks are prime movers of economic growth and integrate Cambodia's economy with the region and the world. The priority focus is now on rehabilitating provincial and rural roads in order to provide access to provincial and rural centers via the paved national primary and secondary road network, and on rehabilitating road links that provide regional and subregional connectivity.

94. **Outcomes:**

- i. **An annual increase in paved road length of 1.3%, on average.** Over the period 2010–2013, 400 km of national or provincial roads and 100 km of rural roads are expected to be paved each year.
- ii. **A 10% reduction in transport costs.** The expected reduction in transport costs has not yet been realized in Cambodia. However, for heavy bulk goods, improvements to the railway, construction of a new branch line to an economic zone near Sihanoukville, and improvement of the ports (sea and inland) can be expected to lead to greater competition among transport

modes and lower transport costs. Transport cost reductions for rail passengers can only be achieved from overall reduced costs resulting from an improved paved road network or from greater competition among road transport operators who are attracted because of better and/or more paved roads.

95. **Outputs:**

- i. **Loans.** One rural roads improvement project is ongoing, while another one and a provincial roads improvement project, have been planned.
- ii. **Technical assistance.** Project preparatory technical assistance has been planned for the provincial roads improvement project.

Support Area 3: Sustainability of the Sector

96. Investments in the road sector need to be preserved by an effective and sustainable road maintenance regime that prolongs the life of road assets. This will ensure sustainability of the sector as well. However, a few projects in the ongoing investment program aim to achieve sustainability of the sector.

97. The RAMP will encourage sustainable road maintenance through the use of private contractors. Approximately 950 km of primary roads will receive structural overlays or bituminous seals, accounting for nearly 50% of the primary paved network. To sustain this progress, a second RAMP-type project will be required before private contractors can achieve good technical standards. ADB should support this project.

98. ADB should continue to support the establishment of permanent weigh stations and complement these with portable weighbridges for use on the rural road network (as planned under the Rural RAMP). New permanent weigh stations should be located at other strategic locations in the country, as necessary, to ensure compliance and enforcement of the road traffic law.

99. Because road safety continues to be a major problem, ADB should provide further assistance to ensure that the National Road Safety Action Plan achieves its objectives, which include requiring motorcycle passengers, as well as drivers, to wear helmets. Given the predominance of motorcycle accidents, motorcycle buyers should be required to present their driving license, motorcycle registration, and proof of insurance before being allowed to purchase a new motorcycle. An effective bus service to and from schools and colleges should also be explored to lessen the use of motorcycles for routine journeys.

100. Changes to road design guidelines and technical specifications are needed in order to provide more durable infrastructure that will be resistant to climate change.

101. **Outcomes:**

- i. More durable roads, leading to lower maintenance requirements and allowing concentration on paved road network expansion.
- ii. Reduction in the number of fatal accidents to 7 per 10,000 vehicles (the previously targeted figure).

102. **Outputs:**

- i. New permanent weigh stations; staff trained to operate existing and new weigh stations.
- ii. Revised design manuals and technical specifications.

2. Assumptions and Risks

103. The first key assumption is that the government continues to accord high priority to transport infrastructure development and maintenance in order to support socioeconomic development in Cambodia. Priority must be given to developing those roads (or other transport subsectors) that serve rural areas and, therefore, the rural poor.

104. Second, all new laws, regulatory frameworks, and policies must be put in place.

105. The third assumption is that the government is committed to developing rural towns and a transport authority for Phnom Penh, which would serve as a model for the GMS and rural Cambodian towns intended to serve as focal points for economic development.

106. The main risk is that the government's commitment to reforming the transport sector diminishes.

3. Timing and Resources

107. To facilitate further discussion, see the outline of current and future ADB inputs to the transport sector in Cambodia in Figure 2.

IV

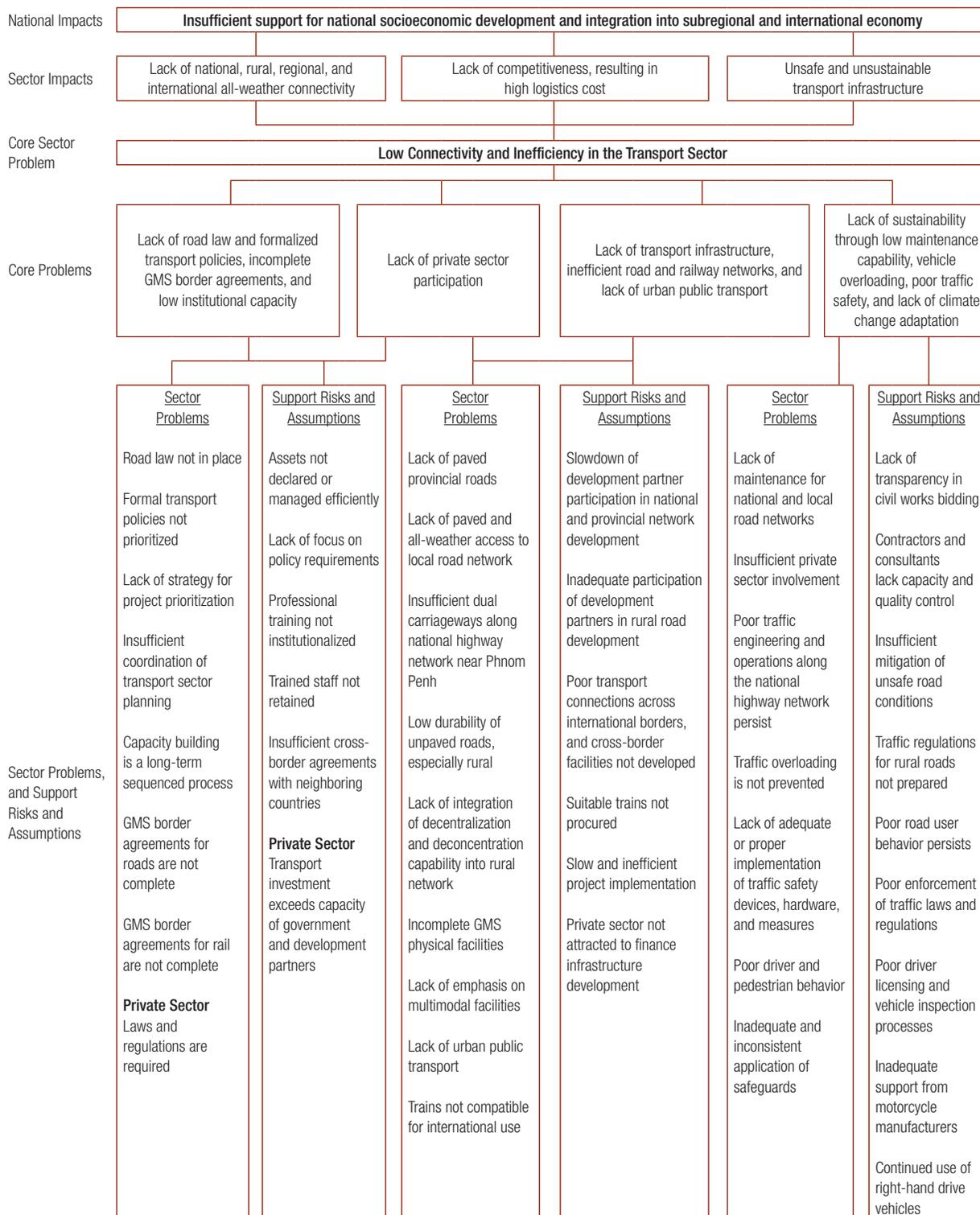
Transport Sector Road Map and Results Framework

Country Sector Outcomes		Country Sector Outputs		ADB Sector Inputs	
Outcomes with ADB Contribution	Targets with Indicators and Baselines	Outputs with ADB Contribution	Indicators with Incremental Targets	Ongoing and Planned ADB Operations	Main Outputs Expected from ADB Interventions
Increased movement of heavy goods by road and rail, in line with weight regulations	<ul style="list-style-type: none"> Cross-border road traffic allowance with Viet Nam increases from 150 vehicles in-country at one time in 2009 to 300 vehicles by 2013 Rail freight traffic (tons/km) increases from 151,152 in 2009 to 1 million in 2013 Total percentage of overloaded trucks inspected at all weigh stations decreases to 5% of total inspected by 2013 (in 2011: 20%) 	<p>Roads</p> <ul style="list-style-type: none"> Increased length of paved road network Increased amount of primary and secondary roads receiving periodic maintenance <p>Weighbridges</p> <ul style="list-style-type: none"> New and existing weighbridges operational <p>Laws, Policies</p> <ul style="list-style-type: none"> Improved policies, laws, and funding for transport issues by MPWT and MRD Effective PPPs 	<ul style="list-style-type: none"> Paved road length increases at 1.3% per year Length of primary and secondary roads subject to routine maintenance increased from 2,138 km in 2009 to 2,947 km in 2013 Number of operational weighbridges increased from 0 in 2009 to 8 in 2013 Road law, transport sector, and rural road policies published (on websites) by 2013 Fines for overloaded vehicles in place by 2011 Increased number of PPP agreements in place (13 in 2010; 25 in 2015) Length of extensions and linkages completed by 2013 Rail safety systems installed, and trains fitted to travel nationally by 2013 Traffic safety measures installed on northern line (0% in 2010; 100% in 2013) 	<p>Planned Key Activity Areas</p> <p>Pipeline Projects</p> <p>Loan Program</p> <ol style="list-style-type: none"> Rural Roads Improvement II Provincial Roads Improvement <p>TA Program</p> <ol style="list-style-type: none"> PPTA for Provincial Roads Improvement Strengthening the Institutional Capacity of the Ministry of Public Works and Transport <p>PPP Program</p> <p>Support for railways</p> <p>Ongoing Projects</p> <ol style="list-style-type: none"> Road Asset Management GMS: Railway rehabilitation in Cambodia GMS: Southern Coastal Corridor GMS: Cambodia Northwest Provincial Road Improvement GMS: Railway rehabilitation in Cambodia (including supplementary lines) Rural Roads Improvement 	<p>Planned Key Activity Areas</p> <ul style="list-style-type: none"> Road and rail contracts Construction of dry port GMS CBF contracts Road and rail cross-border transport agreements 1,000 km rehabilitated to paved road standard; MRD capacity building; road maintenance program 200 km of provincial roads rehabilitated to paved road standard <p>Ongoing Projects</p> <ol style="list-style-type: none"> CBFs rehabilitated (O'smach) Periodic maintenance of primary road network (950 km) Rehabilitation/reconstruction of railway (branch railway lines, new stations, sidings, terminals, etc.) NR56: 113 km rehabilitated to paved road standard; road maintenance; safety and safeguards program
Improved road and rail connectivity (interprovincial and regional)	<ul style="list-style-type: none"> 100% of provinces connected by paved roads by 2013 (in 2008: 70%) 				
Improved road and rail safety (e.g., fewer accidents and derailments)	<ul style="list-style-type: none"> Road traffic fatalities reduced from 12.3 per 10,000 vehicles in 2009 to 7 per 10,000 vehicles by 2013 Rail derailments and accidents reduced to 0 by 2013 	<p>Rail</p> <ul style="list-style-type: none"> Completion of rail linkages and extensions (e.g., north-south) Adherence to rail safety systems and standards 			

ADB = Asian Development Bank, CBF = cross-border facility, GMS = Greater Mekong Subregion, IRC = Inter-Ministerial Resettlement Committee, MPWT = Ministry of Public Works and Transport, MRD = Ministry of Rural Development, NR = national road, PPP = public-private partnership, PPTA = project preparatory technical assistance, TA = technical assistance.

Source: ADB.

Figure 3 Transport Sector Problem Analysis



GMS = Greater Mekong Subregion, TA = technical assistance.

Source: ADB.

Appendix 1

Priority Laws, Policies, and Regulatory Frameworks

1. Priority laws, policies, and regulatory frameworks in the National Strategic Development Plan (NSDP) 2009–2013 update of May 2010 (in draft) are listed below.

2. In the draft NSDP, the government has recorded that it will speed up the adoption of the Transport Policy, the Law on Roads, and the supporting legal and regulatory framework for efficient management of transport infrastructure. The government will place emphasis on traffic safety and stricter measures against transportation offenses, including overloaded carriers.

3. In the development of policy, and the legal and regulatory framework and its enforcement, the Ministry of Public Works and Transport will

- enforce the Road Traffic Law (promulgated on 8 February 2007) and the Sub-decree on the Management of Garages that Repair and Transform Vehicles.
- draft policies and regulations that have already been submitted for approval, including
 - National Policy on the Transport Sector,
 - Sub-Decree on the Management of Waterways Transportation (being revised), and
 - National policies, strategies, and action plans on road traffic safety.
- draft policies, laws, and regulations to be submitted for approval, including the following:
 - Sub-Decree on the Management of Goods and Passenger Transport Businesses,
 - Sub-Decree on Establishing a Joint Control Committee for Road Traffic Violation,
 - Law on Multimodal Transport,
 - Procedures on De-scoring of Driving License,
 - Law on River Transport,
 - Law on Road Traffic (being amended),
 - Master Plan on Inland Waterway Transport,
 - Sub-Decree on Vehicle Registration and Issuance of Vehicle Identification Card and License Plate,
 - Sub-Decree on Road Transport,
 - Sub-Decree on Establishing the Road Traffic Safety Committee (being revised),
 - Sub-Decree on the Management of Transport Service Companies,
 - International Driving License (being created),
 - Sub-Decree on the Management of International Driving Licenses,
 - Policies and Action Plans on Traffic Safety,
 - Law on Transportation (being formulated),
 - National Policy and Administrative Management System for the Port Sector in Cambodia 2009–2011 (being developed),
 - Policy on Maritime Transport,
 - Procedures on Sea Vessel Registration,
 - Maritime Navigation Code (being reviewed),

- Sub-Decree on Establishing the Spilled Oil Combating Committee (being prepared),
 - Sub-Decree on Issuance of Sailor's Book (being prepared),
 - Law on Ports (being prepared),
 - National Policy on Ports (being formulated),
 - Sub-Decree on Waterway Transportation (being prepared),
 - Royal Kram on Maritime Transportation (being reviewed),
 - Sub-Decree on Establishing a National System for Preventing Oil Spills and Cooperation in Dealing with Oil Spills,
 - Prakas on Authorization for Vessels' Docking at the Ports of the Kingdom of Cambodia,
 - Prakas on Security within the Port Zones of the Kingdom of Cambodia,
 - National Plan to Prevent Risks Caused by Spilled Oil,
 - Master Plan on Waterway Transportation in the Mekong River System of Cambodia,
 - Master Plan Update on Development of Road Networks in the Kingdom of Cambodia, and
 - Master Plan on Maritime Transport and Seaports.
- promote ratification and implementation of the Agreement on Waterway Transport with Viet Nam.
 - promote ratification and implementation of the Association of Southeast Asian Nations (ASEAN) Agreement on Inter-State Transport; the First ASEAN Protocol on the Identification Cross-Border Check Points and Transit Passages; and other international conventions and agreements.

Appendix 2

Previous Rural Road Infrastructure and Current Transport Sector Projects

1. The previous large rural road infrastructure projects funded by other development partners are listed in Table A.1. While KfW projects comprise large-scale investments in road infrastructure, and although civil works are part of the World Bank projects, the work carried out has been capacity building.

Table A.1 Rural Road Infrastructure Projects Funded by Other Development Partners

Item	Development Partner	Loan Title	Date		Current Status
			To	From	
1	ILO/Sida	ILO Upstream Project	1998	2002	Closed
2	WFP	World Food Programme	1996	2003	Closed
3	World Bank	Flood Emergency	2001	2005	Closed
4	World Bank	Steung Chinet	2002	2006	Closed
5	World Bank/IFAD	Community Based Rural Development Project	2001	2008	Closed
6	KfW/WFP	TRIP Phases I, II, and III and Flood Repair Programme	1992	2005	Closed
7	KfW	TRIP Phase IV	2005	2007	Closed
8	KfW	Rural Roads Improvement Project	2007	2010	Active
9	World Bank	Provincial Rural Infrastructure Project	2004	2010	Active

IFAD = International Fund for Agricultural Development, ILO = International Labour Organization, Sida = Swedish International Development Cooperation Agency, TRIP = Tertiary Rural Infrastructure Programme, WFP = World Food Programme.

Source: Ministry of Rural Development of Cambodia. 2007. Draft Strategic Plan for Rural Roads.

2. Ongoing transport sector projects, the corresponding development partners, the implementation period, and the cost for each project, are listed in Table A.2. ADB projects have been included for completeness and because generally ADB has cofinanciers. The list indicates projects in the road, railway, and ports subsectors. Road projects usually relate to substantial sections of the named roads rather than their whole length. As a result, a particular road may be named more than once in the list. Overall, the number and total value of projects indicates the commitment of the government and development partners to improving transport sector infrastructure.

Table A.2 Ongoing Transport Sector Capital Investment Projects

Item	Development Partner	Project	Date		Amount (\$ million)
			From	To	
Roads					
1	Viet Nam	Improvement of NR78	2007	2009	25.8
2	Korea, Republic of	Reconstruction of NR3	2008	2011	37.0
3	JICA	Improvement of NR1	2003	2012	68.0
4	ADB and OPEC	GMS improvement of NR5 and NR6	2005	2010	77.5
5	PRC	Rehabilitation of NR76	2008	2012	52.0
6	PRC	Rehabilitation of NR62	2009	2012	52.6
7	PRC	Rehabilitation of NR57	2008	2012	42.0
8	World Bank	Provincial and Rural Infrastructure Project	2004	2009	16.6
9	Thailand	Rehabilitation of NR67	2007	2010	32.5
10	PRC	Prek Tamak O Raing Ao-Anlung Chrey road	2007	2011	77.5
11	ADB	Southern Coastal Corridor Project	2008	2012	18.0
12	ADB, World Bank Australia	Road Asset Management Project	2008	2013	58.8
13	PRC	Rehabilitation of NR62 and provincial road No. 210	2008	2012	57.0
14	PRC	Reconstruction of NR78	2008	2011	55.0
15	Kuwait	Rehabilitation of Thmor Korl-Bavet-Sampov Lun	2010	2012	58.8
16	ADB	Northwest Provincial Road Improvement Project	2009	2012	33.0
17	RGC	Rehabilitation of NR68	2009	2012	54.0
18	Korea, Republic of	NR31, NR33, and Provincial Road N117 Kampot	2009	2012	35.0
Railways					
1	ADB, Malaysia, OPEC, RGC	Rehabilitation of the railway in Cambodia	2008	2010	73.0
Major Bridges					
1	JICA	Construction of Neak Loeung Bridge	2011	2015	134.0
2	PRC	Construction of Prek Tamak Bridge	2007	2010	43.5
3	Viet Nam	Construction of Chrey Thom Bridge	2009	2011	22.7
4	PRC	Construction of Prek Kdam Bridge	2007	2010	29.0
Shipping Ports					
1	JICA	Sihanoukville port duty free zone, Stage 1 and Stage 2	2006	2012	38.0
2	JICA	Renovation of Sihanoukville Quay II	2006	2009	40.0
3	JICA	Sihanoukville east port for offshore petroleum	2009	2015	67.0
Other					
1	Korea, Republic of	Siem Reap sewage system	2009	2012	44.0
2	ADB	GMS Mekong tourism development project	2006	2009	10.0

ADB = Asian Development Bank, GMS = Greater Mekong Subregion, JICA = Japan International Cooperation Agency, NR = national road, OPEC = Organization of the Petroleum Exporting Countries, PRC = People's Republic of China, RGC = Royal Government of Cambodia.

Source: Ministry of Planning of Cambodia. 2009. *Public Investment Programme: 3-Years-Rolling 2010–2012*.

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Cambodia: Transport Sector Assessment, Strategy, and Road Map

The Asian Development Bank is preparing sector assessments, strategies, and road maps (ASRs) to help align future ADB support with the needs and strategies of developing member countries and other development partners. ASRs are a working document that help inform the development of country partnership strategies. This transport sector ASR highlights development issues, needs and strategic assistance priorities of the Government of Cambodia and ADB, with a focus on rail, urban transport, and roads. It highlights sector performance, priority development constraints, the government's strategy and plans, other development partner support, lessons learned from past ADB support, and possible future ADB assistance, including knowledge support and investments. The product serves as a basis for further dialogue on how ADB and the government can work together to tackle the challenges of managing transport sector development in Cambodia in the coming years.

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