ADB

Lao People's Democratic Republic

Transport Sector Assessment, Strategy, and Road Map

Asian Development Bank

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Transport Sector Assessment, Strategy, and Road Map

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Contents

Tables and Figures

Tables

Figures

Currency Equivalents

(as of 14 December 2011)

Currency unit	=	kip (KN)
1.00	=	$0.00012
$1.00	=	8,017.0

Abbreviations

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
ASR	–	assessment, stragegy, and road map
CPS	–	country partnership strategy
DOR	–	Department of Roads
DOT	–	Department of Transport
DPWT	–	Department of Public Works and Transport
GMS	–	Greater Mekong Subregion
GTZ	–	Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation Agency)
ISWG	–	Infrastructure Sector Working Group
JICA	–	Japan International Cooperation Agency
KfW	–	Kreditanstalt für Wiederaufbau
Lao PDR	–	Lao People's Democratic Republic
MPWT	–	Ministry of Public Works and Transport
OPWT	–	office of public works and transport
PRC	–	People's Republic of China
SAPE	–	sector assistance program evaluation
TA	–	technical assistance
URMF	–	Unified Road Management Framework

NOTE:

The fiscal year (FY) of the Government of the Lao People's Democratic Republic is from 1 October to 30 September. FY before a calendar year denotes the year in which the fiscal year ends, e.g. FY2000 ends on 30 September 2000.

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I Introduction

1. This transport sector assessment, strategy, and road map (ASR) guides the formulation of Asian Development Bank (ADB) assistance to the transport sector in the Lao People's Democratic Republic (Lao PDR) during 2011–2015. The ASR is a working paper based on a systematic review of the changing needs of the Lao PDR transport sector and consultations with the Government of the Lao PDR and other development partners. The ASR is consistent with ADB's Strategy 2020 that sets out a framework for ADB's operations from 2008 to 2020. A detailed description of the transport sector in the Lao PDR is presented in Appendix 1.

2. For almost 3 decades, ADB has been a key development partner with the Lao PDR through the provision of technical assistance (TA) and finance for investment in infrastructure, facilities, and improved community services. The present country partnership strategy (CPS) for the Lao PDR (2006–2011) has guided assistance by ADB and was evaluated by the Independent Evaluation Department. The findings and conclusions of the evaluation and the government's policies and priorities for the Seventh Five-Year National Socio-Economic Development Plan, 2011–2015 provide lessons and guidance for formulating a future strategy for ADB to assist in the transport sector during this period.

3. Fieldwork was conducted during regular missions to the Lao PDR to ensure comprehensive data gathering and consultation process with the government and other development partners. Preparation of the ASR included peer review, incorporation of comments received on draft versions, and presentations during CPS activities. The ASR is a working paper and will be updated along with the next CPS or when it becomes necessary.

II Sector Assessment

A. Sector Assessment: Context and Strategic Issues

1. The Transport Sector Context

4. Road transport currently represents 98% of total passenger–kilometers traveled and 86% of weight–kilometers of freight moved in the Lao People's Democratic Republic (Lao PDR). Air travel plays an important but limited role for enabling access to remote parts of the country, and water transport provides for transport along navigable waterways. Rail transport is presently at a very early stage of development.

5. Preservation and development of the Lao PDR road network, which sits centrally in the Greater Mekong Subregion (GMS) network, is crucial to national and regional integration. However, the country's low population density and varied topography increase the cost and complexity of meeting travel needs. The very poor live in remote, usually upland, areas where infrastructure is limited. Improvements in rural accessibility and strengthening of the provincial, district, and community road network to all-weather standards were identified as priorities in the National Growth and Poverty Eradication Strategy of 2004, which sets out the government's policy for poverty reduction.

6. Continued economic growth, including growth in subregional trade, will generate an increasing demand for travel and a corresponding need for improvement of transport infrastructure. Growth in freight transport demand is likely to be broadly similar to the rate of economic growth, and passenger travel is likely to increase at a similar or slightly faster rate. With economic growth of 7%–8% per annum anticipated in the medium term, considerable additional transport demand will need to be accommodated in the future.

7. National government activities in the transport sector are undertaken primarily by the Ministry of Public Works and Transport (MPWT). Divisions in MPWT with operational responsibilities are the Department of Civil Aviation, Department of Inland Waterways, Department of Public Works and Transport (DPWT), Department of Roads (DOR), Department of Transport (DOT), and the Railway Authority, as indicated in Table 1. The Department for Planning and Cooperation in MPWT is responsible for overall management of development assistance programs. Traffic enforcement is undertaken by the Traffic Police Department (TPD) in the Ministry of Public Security. Urban roads are the responsibility of urban development administration authorities, which are responsible to their provincial governments and, in the case of the Vientiane Urban Development Administration Authority, to Vientiane Prefecture. The Ministry of Finance continues to play a major role in financing transport sector activities through the national budget.

8. The government is committed to decentralization, which is sometimes referred to as delegation of powers, and functions that are best carried out at a province or district level, close to local communities. A division of DPWT is located in each of the country's 18 provinces. Each DPWT reports to the governor of the province, with MPWT also providing direction, guidance, and support. DPWTs are, in turn, supported by an office of public works and transport (OPWT) in each district center in a province. A traffic police office in each province provides an equivalent arrangement for traffic enforcement.

9. Responsibility for the prioritization of construction and subsequently for undertaking maintenance of rural transport infrastructure rests with provincial governments supported by the districts, and in close consultation with local communities using the community road model. The role of the central government through DOR is to ensure an appropriate and justified allocation of national funds to support the overall objective of improving rural accessibility as a means of addressing rural poverty.

10. National interagency coordination and consultation is through the National Transport Committee, which was established in 2002 and has a secretariat in DOT. The committee comprises representatives of the ministries of finance, commerce, foreign affairs, and public security as well as MPWT and transport industry representatives. It addresses a range of issues, including planning transport services; setting maximum transport tariffs; establishing standards for road vehicles; coordinating government activities; acting as a focal point for international agreements and agencies that influence transport operations in the Lao PDR (e.g., the Association of Southeast Asian Nations [ASEAN], GMS, and various United Nations programs); assessing the benefits of acceding to international agreements and conventions; and coordinating, implementing, and monitoring Lao PDR's activities under agreed international agreements. The law under which the National Transport Committee was established allows creation of transport committees at provincial, municipal, and special zone levels to provide advice on transport operation, determine routes and transport prices on the basis set out by MPWT, and encourage enforcement of laws and regulations.

Table Institutional Arrangements in the Transport Sector

Function	Subsector			
	Road[a]	Aviation	Waterways	Rail
Policy	DOT, DOR	DCA	DOW	DOT, RA
Infrastructure				
- Planning[b]	DOR	DCA	DOW	RA
- Construction preparation and management	DOR, DPWT	DCA	DOW	RA
- Maintenance management	DOR, DPWT	DCA	DOW	RA
- Delivery of works and maintenance	Mix of private sector contractors and SOEs	Private sector contractors and own staff	Mainly private sector contractors and some SOEs	Mainly private sector contractors
- Operation	DPWT	DCA	DPWT	SRT
- Financing	MOF, RMF, donors	MOF	MOF	MOF and donors
Transport services				
- Provision	Private sector and one SOE (State Bus Company)	SOE (Lao Airlines) and international airlines	Mainly private sector	SRT
- Regulation and enforcement	DOT, DPWT, TPD, TPO	DCA	DOW, DPWT	RA
- Safety	DOT, DPWT	DCA	DOW, DPWT	RA

DCA = Department of Civil Aviation, DOR = Department of Roads, DOT = Department of Transport, DOW = Department of Inland Waterways, DPWT = Department of Public Works and Transport, MOF = Ministry of Finance, RA = Railway Authority, RMF = Road Maintenance Fund, SOE = state-owned enterprise, SRT = State Railway of Thailand, TPD = Traffic Police Department, TPO = Traffic Police Office.

[a] Urban roads are the responsibility of urban development administration authorities, which receive technical assistance from DPWTs and some financial assistance from the Road Maintenance Fund in addition to their own sources of income and funding.

[b] The Department of Planning and Cooperation takes on an overarching role through its work in supporting the Infrastructure Sector Working Group.

Source: ADB.

2. Strategic Issues

11. Significant progress has been made in improving roads, waterways, and air travel in the past 2 decades, but several challenging issues remain. This section identifies four key issues facing the performance of the transport sector in the Lao PDR: (i) investment needs exceed available funds, (ii) limited forward investment planning, (iii) unclear potential role of nonroad modes of transport, and (iv) new challenges of climate change.

a. Investment Needs Exceed Available Funds

12. The estimated investment requirements of MPWT for the national socioeconomic development plan (2011–2015) are more than $3.3 billion, whereas the resources available are only $650.0 million (Appendix 3). These estimates do not allow for any funding of waterways, aviation, or rail for which MPWT has made separate estimates of investment totaling $200 million per annum to 2015. Consequently, funding constraints will limit the extent to which transport, mainly road improvements, can be achieved and highlight the need for careful prioritization of expenditures.

13. To protect investments made to date, the preservation[1] of existing roads (and other vital transport infrastructure) must be accorded the highest priority. The cost of road preservation is estimated at $32 million per annum[2] for 2011–2015 as shown in Appendix 3. This cost is equal to 24% of the $130 million per annum in funds from all sources that MPWT projects to be available over the period. A desire to improve the standard of the road network, in particular to seal more roads, improve rural access, and extend the national and GMS road network, adds further to the demand for financing. The available funding for roads and other transport improvement works is estimated to average $130.0 million per annum in 2011–2015, which is far less than the total estimated cost of $3.3 billion for the desired improvements for the period.

b. Limited Forward Investment Planning

14. The framework for road planning and investment is the national 5-year plan, which is prepared under the leadership of the Ministry of Planning and Investment. At the beginning of the planning cycle, the ministry seeks financial plans from each province and government agency for their proposed investments in infrastructure and services for the forthcoming plan period. However, the projects and programs on which the budget is based are not prepared comprehensively and not always prioritized. Requests for funds usually exceed the funds likely to be available. The Ministry of Planning and Investment collates the financial plans and within predetermined sectoral priorities, attempts to allocate funding to each of the national, provincial, and district units. The process involves intense lobbying by provincial governors and district heads for funding. The resultant 5-year investment plan excludes recurrent financing. Although the MOF is consulted during the preparation of the plan, it does not have a central role in its preparation, but it must take responsibility for financing the plan's implementation. Overall, the process needs to be more methodical and transparent. The new budget law does stipulate a medium-term budget, and the budget decree requires a 3- to 5-year horizon; the national socioeconomic development plan "…needs to be anchored by a medium-term budget" and "…line ministries should begin to set out [the plan's] priorities in a program-based structure and prepare medium-term cost estimates."[3] Donor

[1] Preservation includes routine and periodic maintenance as well as rehabilitation.

[2] Government of the Lao PDR, MPWT. 2009. *Strategy for Transport Sector Development for the Period 2008– 2010 and Direction for 2011–2015*. Vientiane.

[3] ADB. 2009. *Risk Assessment and Management Plan: Country Strategy and Program for Lao People's Democratic Republic*. Manila. November.

support is essential in assisting the government to strengthen national investment planning to improve development outcomes.

15. Despite these planning provisions, forward investment planning is still limited. Funding allocations for roads and other transport investments are made annually. Lack of clear and predictable medium-term forward budgeting increases the need for provinces to compete for funds each year. The benefits of developing a multiyear funding program based on sound priorities include (i) increased stability of funding for priority subprojects; (ii) better coordination of transport improvements with service delivery by other sectors, on both the government and donor sides; (iii) increased accountability of provinces and districts for the quality of implementation, including safeguards management, which is a precondition for effective capacity enhancement; and (iv) a positive influence on the strengthening of consultant and contractor capability through more stable workloads.

c. Unclear Potential Role of Nonroad Modes of Transport

16. Road transport will continue to be the dominant mode of transport in view of the topography of the Lao PDR, the current low density of the population, and the flexibility and relatively low cost of road transport. However, the optimal role of other modes of transport is unclear because each mode's infrastructure development plan has been prepared separately in the past. The country's small population and rugged terrain will constrain the role of railways as an efficient means of domestic transport.[4] The traffic with the greatest potential for rail transport will be bulk goods, especially minerals, and also containers—if there is sufficient volume, and if train services are competitive with roads in terms of cost and service quality. To play a key role in GMS transport, government authorities dealing with railway transport will need sufficient institutional capacity to coordinate its services with those of neighboring countries.

17. While water transport is limited due to constrained coverage and the seasonal flow of waterways, there is moderate potential for growth, with the greatest promise for freight in locations where road access is poor or where there is concentrated demand for movement of bulk materials (e.g., for mining), movement for local social purposes where road access is poor, and tourism. Demand for air travel will continue to be driven largely by tourism and the needs of business and the government.

18. The quantity and quality of current data on travel demand are not comprehensive; they rely on traffic counts, airport movement records, shipping volume records at ports, and customs data on international trade volumes. For this reason, MPWT's strategy for roads as proposed for the national socioeconomic development plan is based on "bottom–up" evaluation (i.e., from district to ministry level) to prioritize the road maintenance needs and the construction of new links.

d. New Challenges of Climate Change

19. The Lao PDR is one of the world's most vulnerable countries to climate change because of high socioeconomic dependence on climate-sensitive sectors, such as agriculture and water resources.[5] The southwest monsoon, which is a key determinant of rainfall in South and Southeast Asia, including the

[4] Railways can provide an efficient transport service in some market segments. Experience in other countries suggests two key markets: (i) passenger travel where there are either (a) very large passengers flows, or (b) when passengers are prepared to pay a premium for the service that railways can offer; and (ii) freight market segments where rail has a competitive advantage, which is likely to include (a) the movement of bulk, relatively low-value freight over even moderate distances (around 100 kilometers or more); (b) the movement of higher-value, containerized traffic over longer distances (around 500 kilometers or more); and (c) movement of freight where other transport, geographic, or social constraints make it best suited. Railways generally need to carry large quantities of traffic to justify the high cost of fixed infrastructure, such as tracks and signaling systems.

[5] ADB. 2010. *Key Constraints to Sustainable Growth and Poverty Reduction in Lao PDR*. Manila. February.

Lao PDR, is expected to both intensify and become more variable between years.[6] The retreat of Tibetan glaciers and snowfields is expected to have a significant downstream effect on the Mekong River's flow regime. Recent hydrological modeling prepared by the Mekong River Commission suggests that flow may be reduced to 30% over the next 50 years. If confirmed, this will have significant implications for the transport sector, especially on (i) navigability of waterways; (ii) design standards for new and upgraded river ports and associated facilities; and (iii) design standards for new and upgraded roads to cope with changes in rainfall intensity, associated flooding, and slope stability. Urban roads and drainage infrastructure will also be affected.

B. Road Subsector Assessment

1. Constraints

20. **Current status.** The total length of the classified road network of 35,600 kilometers is now reasonably mature, and the network is not likely to expand substantially in the near future. Over 80% of the network was rated as being of a fair or better condition in 2005. Key constraints in the road sector are summarized below.

a. Mature Network Increases the Need for Sound Articulation of Priorities

21. Given the mature status of the national network and the near completion of a provincial road network that links all provincial capitals with an all-weather road, the future pipeline of candidate new road projects with high economic returns is limited. Future road activities will increasingly need to focus on maintenance to preserve the road network and on capital works to improve the existing network when warranted. Investment planning and prioritization require further improvement. National roads, including those that are part of the planned GMS network, need to be prioritized using strict economic criteria. District and rural roads are prioritized mainly on the social criterion of basic access. Provincial roads are prioritized on a combination of access and economic criteria (footnote 2). No formal system is used for urban and special roads.[7] The government is developing its capacity to plan and prioritize road development and maintenance through the Unified Road Management Framework (URMF)[8] established by DOR. The value of the models that constitute the URMF depends on having up-to-date data on road system conditions, collected at regular intervals.

b. Limited Funds for Road Investments and Operation and Maintenance Remain a Challenge

22. The demand for road improvement of all types exceeds the available resources by a substantial margin. Although MPWT has strengthened its ability to finance road expenditure from domestic resources, there is a continued heavy reliance on official development assistance funding to support road

[6] Adamson, P. 2008. Adaptive Risk Management in Large Tropical Monsoonal Rivers: Context, Challenges, and Opportunities. Paper for International Association for Impact Assessment Conference. Perth. 4–10 May.

[7] The term "special roads" includes forestry roads, access to special industrial zones, and defense roads.

[8] Within the URMF, DOR uses a Road Management System for national roads, and DPWTs use the Provincial Roads Management Maintenance System. The latter is a model specifically developed for use in the Lao PDR for provincial, district, and rural roads.

and other transport investments. Development partners contributed 76% of total funding to the sector in 2008–2009 (Appendix 3).[9]

c. Negative Consequences of Road Use Increasing

23. With growing traffic, greater attention to traffic management along highways and urban areas will be needed for traffic efficiency and safety reasons. Similarly, greater management of the safety and emissions performance of new and in-use domestic vehicles will be needed. Improved transport management of hazardous loads and oversized vehicles is needed to avoid adverse environmental impacts and undue road damage. Increased use of highways will require more stringent right-of-way management to separate existing settlements from the roadway and to direct induced development to appropriately serviced areas. Where road improvement includes widening, there is likely to be an increased demand for environmental and social safeguards.

d. Implementation Capacity Limited but Improving

24. Through external assistance programs, DOR has developed considerable technical capacity in the fields of engineering and project and financial management. DOT, which is responsible for vehicle control and transport operations, has received less assistance, and its regulatory and enforcement capacities remain relatively weak. Decentralization places greater demands on provincial DPWTs and the district OPWTs. Although decentralization in the Lao PDR was initiated in 2000, the devolution of these responsibilities to DPWTs has been constrained by a number of factors such as unclear institutional arrangements, poor coordination between the various decision making bodies of the government, lack of management information systems such as reliable statistics, and insufficient technical expertise and inadequate human and financial resources at the provincial and district levels. In 2004, DPWTs and OPWTs had an average number of permanent staff of 50 and 3, respectively. An expansion of transport investment to meet existing needs would further strain the limited capacities of DPWTs and OPWTs to implement projects in most provinces and districts.

2. Development Needs

25. Five development needs to address the key constraints facing the road transport sector include (i) instituting more selective approaches for infrastructure provision and prioritization; (ii) broadening and deepening available domestic revenue sources for road maintenance; (iii) managing the negative impact of road use; (iv) enhancing capacities of organizations and individuals; and (v) renewing vigor for harmonization of donor activities and procedures. Details of each development need are summarized below.

a. Instituting More Selective Approaches for Infrastructure Provision and Prioritization

26. Considerable emphasis by ADB and other development partners has been placed on developing roads in support of the GMS transport network. These roads facilitate movement of vehicles transiting through the Lao PDR, and also provide vital links between the Lao PDR and markets in neighboring countries. As the key links in the GMS network are near completion, renewed emphasis and resources can be directed to roads that play a prominent role in serving national transport needs. The recent

[9] As described in Appendix 3, there is likely to be intense competition from other sectors for the $10 million in revenues from the NT-2 Hydropower Project that MPWT has earmarked for financing rural roads improvement as part of the strategy presented in the draft national socioeconomic development plan. The large backlog of rural road access needs is estimated to cost up to $200 million to redress according to the World Bank; thus, with the pressure on funding for rural roads, a substantial backlog is likely to remain at the end of the plan period.

ADB transport sector assistance program evaluation (SAPE)[10] noted that a reorientation to emphasize national needs may soon be required. Support to refine prioritization methods would help determine the optimum balance between national and regional roads on the one hand, and provincial, district, and rural roads on the other. The future requirements are to (i) maintain the relevance of the URMF by (a) continuously updating the models and road condition data on which it is based, and (b) developing the skills of existing and new government staff to use the systems; and (ii) extend their application in the future, especially to urban roads that account for a significant share of the road network and are most heavily used.

b. Broadening and Deepening Available Domestic Revenue Sources for Road Maintenance

27. With ADB and other donor support, the government ensures that all national road funding, including donor funding where appropriate, is administered and disbursed through the Road Maintenance Fund. The fund's own-source revenue is expected to be sufficient to fully fund the cost of national road preservation by 2012. A sustained focus on resource mobilization, especially from domestic sources, will be needed to maintain the momentum developed in recent years and to ensure that as a minimum the identified financial resources for road maintenance for the period to 2015 for the national socioeconomic development plan are available. To further expand domestic sources of funding, there is an ongoing need to develop the taxes and charges[11] imposed on motorists, which are currently set at low levels. It is also desirable to ensure that the different categories of road users assume the costs that they impose on the government, community, and environment with taxes being proportional to the impacts generated. Such revised fees would provide a more direct link between the cost of road use faced by users and their decision to travel, resulting in a more optimal level of travel demand. There is a specific need to examine the charges imposed on vehicles that transit through the Lao PDR to ensure that they contribute to the costs that they impose.[12]

c. Managing the Negative Impact of Road Use

28. Several specific constraints, either existing or emerging, need to be addressed to manage the negative impact of road use.

i. **Road safety.** Secure funding is needed to support the National Road Safety Committee to continue to implement the National Road Safety Strategy and Action Plan.[13] This support would sustain a coordinated approach by the agencies with responsibilities for road safety (which also include the education, health, and police sectors), and embed road safety as an inherent part of the regular activities of the agencies. A high priority also needs to be given by MPWT to the road safety features of road networks and road links. At the network level, consistency of design for adjoining sections is required, as is attention to appropriate speed zoning, signs, barriers, and segregation of sensitive land uses (e.g., schools). Development of rest areas along national, including GMS, roads is essential to reduce driver fatigue. DOT is

[10] ADB. 2010. Sector Assistance Program Evaluation: Transport Sector in the Lao People's Democratic Republic. Manila.

[11] Such as, but not only, for vehicle registration, driver licensing, taxes on fuel, and vehicle maintenance.

[12] For example, the short transit distances in the Lao PDR in some cases (e.g., 240 kilometers from Savannakhet to Densavanh for travel between Thailand and Viet Nam, and 244 kilometers from Houayxay to Boten for travel between Thailand and the People's Republic of China) allow trucks to pass through the Lao PDR without buying fuel and thus paying the fuel levy that generates revenue for the Road Maintenance Fund.

[13] Estimated yearly amount is $100,000.

currently addressing this aspect. Adequate and secure recurrent funding will be needed to carry out the above functions.

ii. **Truck overloading.** Truck overloading remains the principal traffic concern because of the damage caused to roads and adverse impact on road safety. While enforcement to control overloading has been effective, overloading is still common, especially on remote roads. Containing and further reducing overloading, and ensuring that fines and charges are set at an appropriate level and that revenue is fully accounted for, will require a reinvigorated program. The main issues associated with the implementation of this program will relate to political willingness to associate various institutions in charge of enforcing the road safety legislation, and that adequate incentives are given to the staff in charge of undertaking transparent controls. There is also a need to review and refine current load standards to overcome current definitional limitations and to facilitate the movement of trucks from neighboring countries.

iii. **Heavy vehicle management.** Under the 2004 GMS Cross-Border Transport Agreement, cross-border trade is based on routes with roadways, bridges, and associated facilities of a high standard and appropriate transit traffic regimes, including exemptions from physical customs inspection and exchange of commercial traffic rights. Full implementation of the agreement has not yet been achieved, but some bilateral agreements are now in force. Lao PDR National Roads 3, 4, and 9, which have been upgraded since 2004 and are part of the GMS corridors, have been designed with ADB support to take higher axle loads (9.1 tons rather than 8.2 tons, which applies to the rest of the country's domestic network) as is standard for other ASEAN countries. Growing demand can be expected from the trucking industry to increase vehicle dimensions, vehicle configurations, and maximum loads as is occurring in other countries. This would affect the design standard of the main roads in the Lao PDR and increase the investment required to construct and maintain roads and bridges. Further, as traffic increases on key corridors, more sophisticated systems for heavy vehicle axle load control will be needed, including managing compliance on vehicle mass and dimension limits and the types of goods carried. Similarly, road design standards need to be reviewed to take account of opportunities to reduce the dangerous mix of slow and fast traffic on some roads, especially in the vicinity of towns. Nationwide application of computerized vehicle registration and driver licensing systems that have been established in Vientiane would support other government activities, such as road safety, traffic management, heavy vehicle management, and enhanced revenue generation.

d. Enhancing Capacities of Organizations and Individuals

29. As noted, the strengthening of capacity for planning and implementation, particularly at provincial and district levels, is a critical challenge. Engendering local ownership and accountability for the quality of planning and implementation of road works and other types of investment is fundamental to creating the right environment for effective capacity development. When stable works programs and sufficient resources are in place, training can focus on strengthening the skills of financial and accounting staff, and training engineering staff to carry out more complex road works as well as to manage safeguards. Appropriate programming, planning, and budgeting systems are needed to support the preparation, implementation, and updating of multiyear rolling investment programs. Strengthening provincial and

national units and improving the skills of their personnel constitute a challenge for the decentralization process that will take time to fully address.

e. Renewing Vigor for Harmonization of Donor Activities and Procedures

30. As identified by the current SAPE, attention to donor harmonization remains important[14] because it will lead to clearer priorities; guide policy and medium-term expenditure planning; and improve the effectiveness, efficiency, and sustainability of external assistance. Improved harmonization should build on the 2006 Vientiane Declaration on Aid Effectiveness. At a practical level, harmonized procurement procedures, design standards, and safeguard procedures—initially concentrating on environmental and social guidelines—offer significant benefits to implementing units by reducing duplication.

31. The Infrastructure Sector Working Group (ISWG), established in 2008, facilitates policy dialogue on key sector issues, the building of an effective partnership among development partners, including coordination of assistance programs, and the execution of the Country Action Plan of the Vientiane Declaration on Aid Effectiveness. The ISWG is jointly chaired by ADB and the Government of Japan, and includes 11 other multilateral and bilateral development partners. It has a secretariat in the Department of Planning and Coordination of MPWT.

C. Assessment of Other Subsectors

1. Railways

32. Given the recent investment that has been made in the rail line from the Friendship Bridge to Thanaleng, appropriate marketing and setting of tariffs are needed to generate enough revenue to maintain the infrastructure. For future railway lines connecting to Viet Nam, the People's Republic of China (PRC), and Thailand, a market-based approach is needed to ensure that the investment is viable and sustainable. The rationale for development of a GMS railway network that will involve new lines in the Lao PDR would need to be based on the demand for commodity movements from other GMS countries. GMS leaders recently approved a strategic framework to examine railway connectivity opportunities and constraints to GMS.[15]

2. Water Transport

33. The potential for economically viable investment in water transport infrastructure, such as upgraded ports and landings, is likely to be limited to locations where substantial traffic growth is expected. Navigational safety needs to be improved. The future role of waterways, particularly with regard to changes in river flow due to upstream dams and the effects of climate change, is uncertain.

3. Air Transport

34. Demand for aviation movements will likely continue to grow at a faster rate than the economy, especially to locations that have significant tourism such as Luang Prabang and Vientiane, because of

[14] ADB. 2010. Transport Sector in the Lao PDR—Balancing National and Regional Development. Draft. March.

[15] ADB. 2010. *Connecting Greater Mekong Subregion Railways: A Strategic Framework*. Manila. The framework was endorsed by the 16th GMS Ministerial Conference in August 2010.

aviation's central economic and administrative role. The general adequacy of current airports will reduce the need for substantial airport development in the near future, although some upgrading to meet specific limitations may be required. Investment will nonetheless be necessary in the medium to longer term to provide additional capacity to respond to growth in travel demand.

4. Logistics

35. The domestic trucking industry in the Lao PDR is evolving, but it is still of modest scale and faces numerous constraints, such as an aged fleet, limited pool of capable transport managers and drivers, and a shortage of financial resources by firms. These constraints reduce the efficiency and increase the cost of trucking and make it difficult for the industry to participate in the growing opportunities to operate cross-border services.

36. With the development of GMS corridors, the eventual full implementation of the cross-border transport agreement, and expanded involvement of international firms (investors and manufacturers), increasing attention will be given to modern, intermodal[16] transport services and storage using up-to-date information and communication technologies. Most logistics are undertaken by the private sector, though the quality of their service depends on interaction with government agencies dealing with transport infrastructure, land-use controls for depots and warehouses, communications infrastructure, legislation, industry regulation, and processing of cross-border movements. MPWT aims to reinforce the Lao PDR's strategic position in the context of regional logistics and promote the shift from being a landlocked to land-linked country. This transition requires reducing the land transport costs associated with inadequate infrastructure as well as border crossings. For instance, the cost of shipping a container from Vientiane to the port in Bangkok accounts for more than one-third of the total cost of sending one container from Vientiane to Europe. A national logistics strategy has been prepared by MPWT in 2010 with assistance from the Japan International Cooperation Agency (JICA).[17] One of the objectives of JICA's project is to enhance the Lao PDR's connectivity with the Southern GMS Economic Corridor. The government's role should be to remove impediments to the development of efficient logistics while ensuring that an adequate regulatory framework is in place to maintain safety; mitigate environmental impacts; and help improve the quality of operators, vehicles, and drivers involved in the transport.

5. Urban Transport

37. **Traffic congestion.** Traffic congestion is increasing in Vientiane and in regional cities, such as Pakse and Savannakhet. From 2005 to 2009, there were around 3,500 accidents in Vientiane. More than 100 people lost their lives, while at least 2,000 sustained injuries associated with accidents. Against a background of significant traffic growth, the number of fatalities and injuries have remained stable in recent years. Congestion and associated exhaust emissions and energy use will be exacerbated by economic growth, increased urbanization, and higher levels of vehicle ownership. Addressing urban transport challenges has been identified as a priority by MPWT and various donors.[18]

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[16] Modern transport logistics call for small and large trucks and other modes, such as railways, to provide a coordinated end-to-end service. Each mode or vehicle type is selected for its appropriateness to the function that is required. For example, large trucks would be used for line haul while small vans may be used for intra-city distribution.

[17] JICA. 2010. *The Comprehensive Study on Logistics System in Lao People's Democratic Republic*. Prepared for the Ministry of Public Works and Transport.

[18] Government of the Lao PDR, MPWT, DPWT Institute. 2009. *The National Strategy and Action Plan on Environmental Sustainable Transport in the Lao PDR.* Vientiane; United Nations Environment Programme. 2008. Vientiane Sustainable Transport Initiative. Submitted to Global Environment Facility. Nairobi.

38. **Public transport.** The current limited formal public transport service in cities may promote a pattern of land use and higher private transport demand that may not be optimal in the long term. Currently, the provision of adequate public transport is a responsibility of local governments, which have fewer financial and institutional resources than national government agencies. For the future, an integrated public transport system for Vientiane—and subsequently for other cities—is essential. In such systems, services can be provided by one or more government or private entities with common contractual terms that include fares, service levels, and quality standards. Provision for walkability and other nonmotorized transport improvement is also required, as well as attention to parking, which affects walkability because cars and motorcycles often park on sidewalks.

39. **Urban roads.** Additional traffic capacity on current roads can be derived by improving traffic management, driver behavior, and traffic enforcement. However, new urban roads, developed in a hierarchical network as proposed in the JICA transport master plan[19] for Vientiane, will also be required to support appropriate urban development and to sustain economic growth. This need will be most acute in Vientiane because of its size and dominant role in the economy.

40. **Transport and land use.** Municipalities have limited powers for managing urban development at present. Strategic land-use planning, approval of industrial developments, and planning for provision of urban infrastructure is carried out by national agencies. Development partners can help improve the integration of land use and transport by supporting the preparation of comprehensive urban development plans, designing supportive urban road and public transport interventions, and supporting the delegation of relevant urban management functions to municipalities when appropriate.

41. **Need for sustained support.** For the increasing urban transport challenges to be addressed as described above, a carefully structured and long-term program of urban transport activities is warranted.[20]

[19] JICA. 2008. *The Study of Master Plan on Comprehensive Urban Transport Master Plan in Vientiane in Lao PDR*. Tokyo.

[20] Current ADB support for addressing urban transport issues includes (i) the Sustainable Transport Initiative that will pilot improvements in Vientiane as part of a regional initiative, (ii) an initial preparatory technical assistance project to examine the needs of three GMS corridor towns in the Lao PDR as part of a proposed GMS subregional project, and (iii) a proposed urban environmental improvement project in Pakse.

III Strategy Update

A. Government Strategy, Policy, and Plans

42. The national socioeconomic development plan includes four main objectives: (i) sustainable economic growth; (ii) achievement of the Millennium Development Goals by 2015; (iii) graduation from Least Developed Country status by 2020; and (iv) sustainable economic, social, and environmental development. The plan places priority on creating an efficient transport system to favor conditions for sustainable growth, poverty reduction, and regional integration to graduate from a landlocked to a land-linked country.

43. In its draft transport strategy for the period to 2020, the government articulates a vision in which the Lao PDR transforms itself to becoming the logistics hub for the region by 2020. [21] The aim is to facilitate the transition of GMS highway corridors to economic corridors by integrating road development with industrial areas and other economic drivers. This transition to economic corridors is being followed by all GMS countries. The main strategies are to develop strategic roads that are important for (i) national economic development; (ii) national economic defense and local economic development; (iii) national and public security; and (iv) national policy, such as alleviation of poverty. MPWT identified the key challenges as (i) shortage of funds for road construction and maintenance; (ii) vulnerability of earth and gravel roads to deterioration in the wet season; (iii) improving macromanagement, including strategic planning, rules, regulations, laws, standards, and specifications; and (iv) improving policies and mechanisms to ensure favorable investment conditions. [22]

44. MPWT has defined preserving the existing road network through road maintenance as the first priority. The second set of priorities includes (i) securing road access to all communities by 2020, (ii) upgrading sections of national roads that carry a high volume of traffic, and (iii) constructing new national road links where needed. In the longer term, MPWT seeks to make roads, particularly provincial, district, and rural roads, passable all year round, and to improve the core road network to the same standards as neighboring countries.

45. The government's focus for air transport is on (i) improving the efficiency and safety of airport services; (ii) examining the feasibility of increasing the capacity of Vientiane's airport; (iii) upgrading airports in Luang Prabang, Pakse, and Savannakhet; (iv) modernizing air traffic control systems; and (v) seeking the introduction of additional international flights and connections to the Lao PDR. The recently created Department of Inland Waterways is preparing a strategy for the development of waterways to increase the role of water transport. With respect to railways, emphasis will be given to exploiting

[21] Government of the Lao PDR, MPWT. 2010. *Strategic Plan for Highway Integration 2020 and Implementation Plan, 2011–2015.* Vientiane.

[22] Government of the Lao PDR, MPWT. 2009. *Strategy for Transport Sector Development for the Period 2008–2010 and Direction for 2011–2015.* Vientiane.

the potential of the current line, seeking resources to extend the line to Vientiane, and supporting the development of the regional railway network with links to the PRC, Thailand, and Viet Nam. Urban transport was identified as a priority by the National Strategy and Action Plan on Environmentally Sustainable Transport.[23]

B. ADB Sector Support Program and Experience

1. Program Description

46. The 2007–2011 CSP for the Lao PDR responded to lessons learned from previous projects by (i) focusing on those sectors and thematic areas where assistance can catalyze or contribute to nationwide impacts and outcomes, (ii) using larger loans and fewer technical assistance projects to reduce transaction costs and enable the government to adopt a more programmatic and harmonized approach, (iii) ensuring that the ADB country program for the Lao PDR complements and generates positive synergies with GMS initiatives, (iv) encouraging an increase in the share of recurrent outlays in public spending, and (v) emphasizing in technical assistance projects the building of competencies of the public service and the creation of institutional incentives to achieve and sustain development results.

47. The CSP is based on promoting pro-poor sustainable growth, fostering inclusive social development, and supporting good governance. Key themes that are addressed through ADB activities include capacity building, empowering women and fostering their equal treatment, promoting private sector development, improving environmental management, and seeking greater synergies between regional and national programs. The CSP indicates that external assistance would focus on (i) integrated support for policy and institutional reform where there is the opportunity for positive change, and strategic investments in priority sectors; (ii) improving the sustainability of public services; (iii) using nonlending services to support improved public expenditure management; and (iv) changing from a regional geographical focus in the Lao PDR to a national and sector-specific approach.

48. Support for roads and GMS corridors is designed to promote trade and economic growth. ADB is supporting the government to expand access to the road network and extend its economic life through assistance for road preservation, improving sector policy and regulations, and mitigating the negative social impacts of road development, including road accidents, via support to the National Road Safety Strategy and Action Plan.

2. Self-Evaluation

49. The CSP completion report found that the total portfolio of ADB transport projects has generally achieved its objectives, but several projects experienced delays.[24] Further weaknesses in the transport sector included (i) inadequate treatment of social and environmental concerns, (ii) lack of financial sustainability, and (iii) safety issues. It was further identified that the investment in physical infrastructure should be complemented by "soft" investments, such as those embodied in the cross-border transport agreement, to ensure competitiveness. The enhancement of multimodal transport within the country's transport system and maximization of economic returns from transport were identified to promote

[23] Environmentally sustainable transport is promoted in Asia by the United Nations Centre for Regional Development, the Government of Japan, other governments, and relevant national and international organizations, through preparation of nationally appropriate strategies and action plans for addressing the negative environmental and social consequences of transport.

[24] ADB. 2009. Completion Report–Country Partnership Strategy: Lao People's Democratic Republic, 2007–2011. Manila. Working draft.

economic growth and to reduce poverty. Further investments in rural infrastructure could improve market access, connectivity, and rural livelihoods. Key lessons for the new CPS are (i) infrastructure needs to be developed in a well planned, coordinated, and prioritized way, with attention to the associated transport and nontransport services; (ii) attention is needed on continued development of human resources and their skills; (iii) private sector development should be promoted; and (iv) resource mobilization needs improving, particularly domestic revenues.

50. The SAPE identifies the constraints faced by the country's transport sector as a primary impediment to national development. [25] It notes the need for further improvement of the transport sector's strategic positioning, with stronger allocations to the national program rather than support to the sector exclusively channeled via the regional cooperation program.[26] The SAPE also notes the potential benefits of an integrated approach with other sectors, such as agriculture, trade, and tourism. It identifies the key needs as (i) a balanced approach to road development to emphasize national over regional needs; (ii) focusing resources geographically where appropriate to increase synergies and to reduce transaction costs; (iii) appropriate allocation of funds for rural road maintenance within a sector-wide framework; (iv) capacity development, including transfer of appropriate knowledge, particularly for provincial units; and (v) increased attention to harmonization of assistance due to the increase in number of donors. The SAPE rates the overall transport sector program *successful* based on relevance, efficiency, effectiveness, sustainability, development impact, and strategic positioning.[27]

3. Lessons Learned and Better Practices

51. Based on the above, the following key lessons and best practices are relevant for the transport sector:

(i) **Improving revenue mobilization remains important, but increased efficiency and effectiveness will also be required.** Increasing revenues from road users remains a priority to generate funds for road improvement but also for emerging areas, such as urban transport, climate change mitigation, and in the long term, other transport modes.

(ii) **Focus on services, not only on provision of transport infrastructure.** The responsibility of transport agencies does not stop with construction and maintenance, but also includes the "software" needed to support optimal road use. Such a focus can improve development effectiveness and efficiency. Although the breadth and depth of the private sector (i.e, consultants, contractors, and operators) are limited, capacities in the transport sector are improving. Enhancing competence of the private sector and maximizing the potential for their involvement in the provision of services would benefit from a clear national framework for development of the transport sector and the role of the private sector.

(iii) **Comprehensive articulation of benefits is needed to address a growing complexity of needs.** There is a need to prioritize regional needs versus national needs, which will require an increased ability to articulate the economic benefits within transport and those flowing on to other sectors. At the same time, national needs, particularly for provincial, district, and rural roads, will require balancing economic with social needs. This will

[25] ADB. 2010. Country Assistance Program Evaluation: Lao People's Democratic Republic—Sustainable Growth and Integration. Manila.

[26] ADB. 2010. Transport Sector in Lao PDR—Balancing National and Regional Development. Draft. June.

[27] A weighted score of 1.7 was assessed out of a total of 3.0. A score between 1.6 and 2.7 is rated *successful*, and a score above or equal to 2.7 is rated *highly successful*.

require funding for rural and district roads[28] (the main road types providing access to rural villages) from a separate allocation, determined, as it is today, by a pro-poor policy, and funding for other roads from another allocation within the overall budget. A focus on provision of appropriate basic access rather than road improvements is a key first step in maximizing accessibility to the rural population.

(iv) **Benefits are maximized by an integrated approach.** This is illustrated by the experience with agriculture projects in the Lao PDR that have provided farm-to-market roads. An integrated approach is necessary to support the transformation of GMS roads to economic corridors; to enhance investments in roads, airports, and river ports, such as by planning of industrial zones to take advantage of transport improvements; and to address urban transport challenges. Better integration of rural access programs with other sectors, such as health and education, is likely to improve social indicators and to reduce poverty. Donors need to consider all issues within and outside transport through the activities of the Government–Donor Infrastructure Sector Working Group, strengthened by the creation of technical subgroups. In each development partner, colleagues from each sector need to maintain a cooperative dialogue to ensure that benefits of their individual projects are maximized.

(v) **Good governance is founded on creating the conditions for transparency and accountability.** Within the transport sector, the current institutional structure is considered adequate with respect to the separation of strategy and policy from the delivery functions. Implementing programs together with the enhancement of monitoring systems can enhance accountability and transparency. Engendering accountability and providing essential knowledge and resources to fulfill responsibilities provide the basis for improving organization and individual capacity.

(vi) **Stability of funding can provide increased certainty and enhance coordination of service delivery.** Multiyear program-based funding rather than 1-year annual works programs can, by providing more stable funding, yield substantial benefits,[29] including increased accountability, certainty, and ability to coordinate service delivery. Reliable program-based funding can support better whole-of-government investment planning and enhance sector integration. The requirement for stable and longer-term funding also applies to donors because they provide much of the financing.[30]

[28] Recent research has found that provision of access that genuinely benefits poor rural communities is complex and not necessarily provided by a paved road that can accommodate general traffic. Benefits were found to be enhanced where consolidation of local produce could avoid road construction (World Bank. 2008. *Rural Road Investment Efficiency: Lessons from Burkina Faso, Cameroon, and Uganda*. Washington, DC). Some of these issues have been recognized in the Lao PDR, and MPWT with World Bank support prepared in 2008 a draft policy on the provision of basic rural access, in which basic access was defined as (i) an all-year round motorable road suitable for farm tractors and motorcycles and not general traffic; (ii) unpaved and likely narrow roads; (iii) roads constructed and maintained by local communities; (iv) be supported by village consolidation. In some areas, it was recognized that basic access could be provided by footpaths or waterways.

[29] Such as those that could be developed by adoption of a rolling 5-year investment program with two forward annual commitments (years 1 and 2) plus 3 years of indicative funding.

[30] Guided by the Vientiane Declaration on Aid Effectiveness in December 2006, MPWT has made early steps toward adoption of a sector-wide approach in the transport sector. MPWT and its key development partners have forged a partnership through the Government-Donor Infrastructure Sector Working Group.

(vii) Efficiencies can be gained by harmonization of donor activities, standards, and approaches to safeguards. A reduction in transaction costs might be achieved through geographic targeting of assistance for appropriate basic rural access,[31] along with harmonization of safeguards requirements of the donor with those of the Government.

C. Other Development Partner Support

52. Other major external supporters of the Lao PDR transport sector are the Australian Agency for International Development, JICA, and the World Bank. The Swedish International Development Cooperation Agency has concluded its long-term assistance program that focused on rural roads and governance. Thailand's National Economic Development Agency provided assistance for the extension of the train line to Thanaleng. Other participants in the transport sector have included the PRC, the Republic of Korea, KfW, and the Department for International Development of the United Kingdom. Past assistance has been primarily directed to infrastructure development, in particular road construction and management of road maintenance, and building institutional capacity for project preparation and implementation and related financial management and business systems. Other past assistance has included implementation of a computerized vehicle registration system for Vientiane through the World Bank-supported Second Road Maintenance Project—which also received support from ADB, Australian Agency for International Development, and Swedish International Development Cooperation Agency—and support from JICA for an urban transport study for Vientiane. Over time, the International Labour Organization, with support from the United Nations Development Programme, and the governments of France, Japan, and Sweden, has helped develop and implement variations of a community road model approach that secures the involvement of affected villagers in the planning, construction, and maintenance of rural roads.

53. Current programs of other development partners include a JICA-assisted technical assistance project to develop a comprehensive logistics master plan for the Lao PDR during 2010. It has prepared feasibility studies for logistic hubs in Vientiane and Savannakhet. During 2010, JICA also funded a project to enhance the urban operations of the Vientiane State Bus Company. This project takes the form of support for bus planning and operations and business planning. JICA plans to provide 40 low-floor, 55-seat, air-conditioned buses to operate a service between the central bus station at Dongdok and the National University of Lao PDR. Separately, JICA is planning to assist the MPWT's Public Works and Design Institute extending the current Vientiane Urban Development Plan to cover the newly urbanizing districts in Vientiane. The German Technical Cooperation Agency (GTZ) is supporting Vientiane to prepare a clean air plan for the city under an ASEAN project. The clean air plan will include several technical components of direct relevance to the ADB Vientiane Sustainable Urban Transport Project, which is about to be completed, including (i) preparation of an emissions inventory, (ii) air quality monitoring system improvements, and (iii) development of short-term public transport and traffic improvement options. Preparation of the Road Subsector Project led by the World Bank was approved in March 2010. The project will support upgrading and improved maintenance of the road network, develop institutional capacity for the management of road programs, and implement a black-spot program to improve road safety.

54. Since 2001, development partners have supported the government to move away from the use of project implementation units to the implementation of projects by line agencies. In keeping with the Paris Declaration on Aid Effectiveness and the complementary Vientiane Declaration on Aid Effectiveness,

[31] Geographic targeting for national and provincial roads is less applicable because the highest priority subprojects may not be geographically concentrated. Also, a geographic targeting of assistance for rural access should not preclude rural access improvement being planned as part of projects involving national roads, and for agriculture, because of the synergies that can be created by their inclusion.

programs now support (i) government leadership in the development of policies, strategies, and the coordination of development actions; (ii) the alignment of the activities of development partners with government strategies and use of government regulations and procedures; (iii) greater harmonization and transparency in activities; (iv) management of resources and decision making that is directed to securing desired outcomes; and (v) accountability by both government and partners for results.

D. Forward Sector Strategy[32]

55. ADB is a long-standing and significant development partner in the transport sector for the Lao PDR and in recent years has provided about one-fifth of all external assistance for the transport sector. Strategy 2020 focuses on five core areas of operations that best support its agenda and reflect developing member country needs and ADB strengths: (i) infrastructure; (ii) environment, including climate change; (iii) regional cooperation and integration; (iv) finance sector development; and (v) education.[33] ADB focuses on five drivers of change: (i) private sector development and private sector operations; (ii) good governance and capacity development; (iii) gender equity; (iv) knowledge solutions; and (v) partnerships.

56. Consistent with Strategy 2020 as well as the strategic priorities of the national socioeconomic development plan, ADB's engagement in the transport sector will (i) seek to remove the identified constraints that impede transport efficiency, primarily in roads and urban transport; (ii) provide continuity in core business areas, such as road maintenance and preservation where the demand remains high;[34] (iii) assist in anticipating emerging issues, such as climate change and with respect to urban transport; and (iv) develop improved and harmonized administrative processes that enhance the ability of the government to plan, coordinate, and implement complex projects in compliance with applicable safeguard policy requirements.

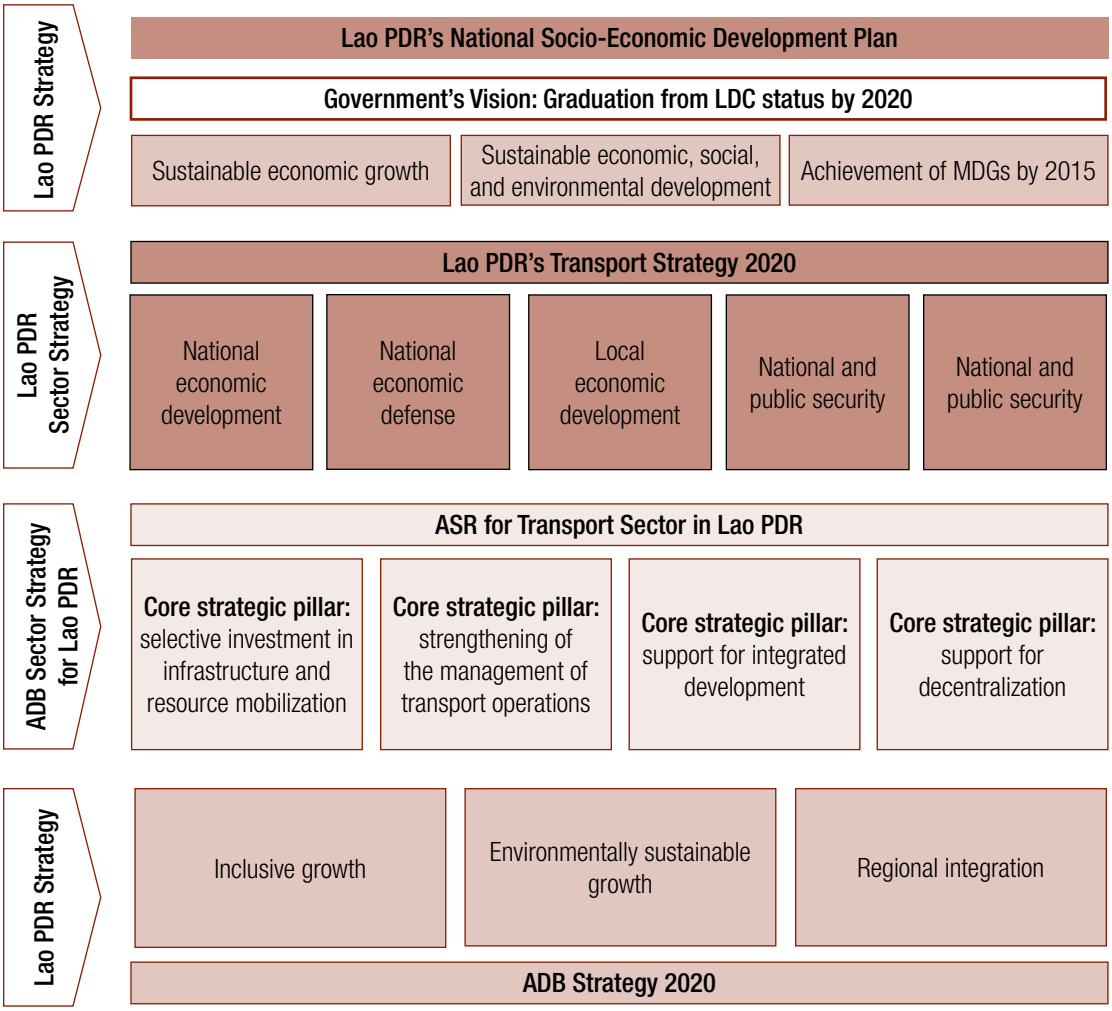
57. In response to the identified constraints and associated development needs, and the identified lessons learned and best practices, a forward strategy for ADB involvement in the Lao PDR transport sector is based on four core strategic pillars: (i) selective investment in infrastructure and resource mobilization, (ii) strengthening of the management of road transport operations, (iii) support for integrated development, and (iv) support for decentralization through building of appropriate institutions and governance arrangements. The following figure presents the strategic framework for the transport sector in the Lao PDR.

[32] This strategy presented here is for discussion purposes only and represents no commitment on behalf of ADB or its clients.

[33] ADB. 2008. *The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

[34] Despite the relatively successful introduction of performance-based road maintenance and labor-based maintenance contracts, these are intended to be improved further and to accompany future ADB projects in the road sector.

Figure 1 Strategic Framework for the Transport Sector in the Lao People's Democratic Republic



ADB = Asian Development Bank; ASR = assessment, strategy, and road map; Lao PDR = Lao People's Democratic Republic; LDC = least developed country; MDG = Millennium Development Goal.

Source: ADB.

1. Core Strategic Pillar 1: Selective Investment in Infrastructure and Resource Mobilization

58. **Project preparation and prioritization.** Priorities between national and regional roads (and urban transport) need to be based on criteria related to the economic and social justification of how proposed projects contribute to the government's overall objectives. The key priorities for road funding, for example, will be maintenance and preservation of the current road network, followed by funding of appropriate basic access improvements in rural areas to reduce poverty; upgrading national road links where economically justified; and then funding new national road improvements. Prioritization should also take into account climate change mitigation and adaptation criteria with respect to road design and maintenance.

59. The quality of project identification will be improved by considering (i) safety as well as environmental and social requirements in all investment activities;[35] (ii) impact of climate change on (but not limited to) existing transport infrastructure, existing transport infrastructure, and design standards; and (iii) the opportunity for integration of transport investments with activities in other sectors.

60. ADB will support the use and continuous improvement of current prioritization tools within the URMF to support the thrust of core strategic pillar 1. Support for disciplined, medium-term investment planning to assist in improving the transport sector will also be provided. An appropriate programming, planning, and budgeting system for MPWT and provincial DPWTs is needed. ADB may consider a programmatic approach to support a medium-term sector-wide investment plan.

61. **Support for rural access.** Enhancing basic rural access is a priority for the government to address rural poverty. Past assistance for the planning, implementation, and maintenance of rural and district roads has equipped the government with the necessary skills to continue with its program. Given the huge investment needs to address the backlog of identified rural access roads and the complexity of providing genuinely beneficial rural access, it is timely to undertake a review of the current rural roads program to assess the benefits achieved and how rural access may be improved.

62. **Resource mobilization to focus on sustaining current system.** The need to generate funds from transport users will continue to be important to maintain the value of current infrastructure by avoiding premature deterioration. The government may feel constrained in its ability to increase taxes on fuels and other charges on vehicle registration and use. ADB will continue to support the government to convince the community of the need for revenue enhancement.

63. **Support for comprehensive transport system stewardship.** ADB will support the ISWG to assist MPWT in leading and providing the necessary stewardship for the transport sector during the period to 2015. The current support by ADB to develop the strategic framework for connecting GMS railways is an example of how ADB's stewardship can contribute to an improved transport system. By supporting the establishment of an active transport sector working group under the ISWG, the ISWG will initiate, in consultation with the government, the needed practical actions to assist MPWT in discharging its responsibilities for preparing a comprehensive medium-term investment plan to meet the requirements of the budget law.

2. Core Strategic Pillar 2: Strengthening of the Management of Transport Operations

64. As part of project grants, ADB will support the strengthening of MPWT and its staff members to identify technical and institutional constraints to the development of efficient and effective transport services in the Lao PDR that are also affordable and safe. A broad range of issues will be addressed, including vehicle and road standards, road-use charges, and laws and regulations. The capacity of MPWT staff to identify key transport sector issues and to establish and quantitatively assess a range of potential remedial initiatives will be emphasized.

[35] Safety should be built into roads through consistency of design; appropriate speed control, provision of signs and markings, and roadside furniture; and roadside rest areas with adequate facilities where appropriate. Similarly, addressing environmental and social concerns needs to start with avoidance by appropriate formulation and selection of options, and, after a preferred subproject option is selected, by focusing on appropriate option design and comprehensive safeguard management.

3. Core Strategic Pillar 3: Support for Integrated Development

65. **Integrated urban development.** There is a growing need to develop traffic planning and management. ADB is well experienced to assist in developing urban roads in the context of comprehensive urban development plans and national and GMS road proposals because GMS roads will affect the amenity and development pattern of small corridor towns. However, the limited technical capacity of the urban development administration authorities poses major challenges. Initial assessments will need to be carried out to identify the scale of the need for urban road development, the economic justification for this, and institutional arrangements whereby MPWT could provide assistance to its staff members.

66. **Integrated transport.** There is potential for formal public transport to be introduced in Vientiane. This will require recurrent financing support. There seems to be insufficient potential in the medium term for formal transport in other cities, which have typically fewer than 100,000 inhabitants. However, in all urban areas, the need for improving other transport modes, such as walking and other nonmotorized transport, will be high. ADB can assist in developing appropriate policies and bring its experience of public–private partnerships, which can also involve the use of private-sector public transport operators, to provide services under incentive-based contracts to the government. This will secure positive outcomes for both public transport users and the government.

4. Core Strategic Pillar 4: Support to Decentralization through Building of Appropriate Institutions and Governance Arrangements

67. Following the SAPE recommendations, ADB will build effective technical staff capacity of national, provincial, and district agencies so that they can fully discharge their responsibilities to implement and manage a transport system, as promoted by the policy on decentralization, throughout the implementation of institutional and capacity building activities. Support for improving the capacity of these agencies to plan, design, implement, and maintain roads and other transport infrastructure (including for safeguard management) will be provided as part of ADB's Sector Governance Project for the Lao PDR (for approval in 2015.[36] In dialogue with the government and key partners, ADB will (i) identify the current staff functions, skills, and experience, and at each geographic level and by agency; (ii) confirm the key constraints, including inadequate resources and impediments to accountability; and (iii) develop appropriate training programs and other remedial measures for the identified gaps. Further, ADB will support the development of improved protocols for planning and coordination to enhance transparency, effective delegation of responsibility to provincial and district units, and quality of decision making.

E. Assumptions and Risks

68. Key assumptions and risks are that (i) the government will pursue its poverty reduction targets with an emphasis on basic infrastructure; (ii) the government will recognize the need to tackle emerging issues such as urban transport or climate change; (iii) there will be effective leadership within the government to prioritize projects to be selective in managing and mobilizing financial resources; (iv) the government will approve and implement the project in a timely manner, following ADB regulations and policies; (v) the government will ensure the adequate coordination levels to implement the integrated projects; and (vi) that there will be effective leadership within the government to proactively support the various institutional and capacity development initiatives to be effective in significantly improving the efficiencies in the country's transport sector.

[36] ADB. 2011. *Country Partnership Strategy: Lao People's Democratic Republic, 2012–2016*. Manila.

IV Sector Road Map and Results Framework

69. ADB's future assistance to the Lao PDR transport sector will address the existing sector constraints in roads and urban transport, as well as emerging issues such as climate change and urban congestion. ADB's future involvement in the Lao PDR transport sector will be based on four core strategic pillars: (i) selective investment in infrastructure (including urban transport) and resource mobilization, (ii) strengthening of the management of road transport operations, (iii) support for integrated institutional capacity building, and (iv) support for decentralization through strengthening of institutional capacity and governance.

70. The road map is consistent with the direction and principles set out in the forthcoming CPS for 2011–2015 and the four identified core strategic pillars of the sector's forward strategy. The proposed transport program for 2011–2015 consists of the Vientiane Sustainable Urban Transport Project and the Road Maintenance Project.

71. The Vientiane Sustainable Urban Transport Project (for Board approval in 2012) will be ADB's first urban transport operation in the Lao PDR and will support ADB's Sustainable Transport Initiative. The project will facilitate improved public transport in Vientiane as well as greater pedestrian access and mobility in the city center.

72. Integrated institutional capacity building activities focusing on strengthening the capacities of MPWT and the DPWTs to carry out their expanded responsibilities under decentralization will be included as part of ADB's Sector Governance Project for the Lao PDR (for approval in 2015). The institutional capacity building program will include three core pillars of support to the Ministry of Public Works and Transport (MPWT), and Department of Public Works and Transport (DPWTs): (i) the planning and prioritization of road improvements, (ii) maintenance of existing roads, and (iii) implementing project safeguards will be included as part of ADB's Sector Governance Project for the Lao PDR.

73. The Road Maintenance Project (for Board approval in 2014) will include capacity building to strengthen maintenance funding and adequate routine operations, and selective investments in road repairs with a focus on provincial and district roads.

74. In addition to the proposed projects, ADB will continue to administer the implementation of three ongoing transport projects over the medium term: (i) the Roads for Rural Development Project (approved in 2004), (ii) the Northern GMS Transport Network Improvement Project (approved in 2007 with a supplemental grant approved in 2010), and (iii) the Second Northern GMS Transport Network Improvement Project (approved in 2010). For both ongoing and planned projects, ADB will maintain and further strengthen its partnership with the government and cofinancing partners to ensure that transport sector improvements contribute to poverty reduction and sustainable economic growth in the Lao PDR.

Figure 2 Sector Results Framework

Country Sector Outcome		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contributions	Indicators with Targets and Baselines	Outputs with ADB Contributions	Indicators with Incremental Targets (Baseline = Zero)	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Contributions
Roads Enhanced trade with GMS countries Improved road conductivity between provinces and neighboring countries Increased efficiency in the transport of goods and people along national and provincial road network **Urban Transport** Improved public transport and traffic management in Vientiane core area Reduced congestion, greenhouse gas emissions in Vientiane core area	Cross-border traffic increases by 10% per year for next 5 years All provincial capitals connected to national road network by all-weather roads by 2015 Public transport use in Vientiane core area increases by 100% by 2020 Average Vientiane trip times decrease by 25% by 2020 Traffic fatalities in Vientiane core area decrease by 20% by 2020	**Roads** Increased length of paved road network Increased periodic maintenance of national and provincial roads Improved traffic safety on national and provincial roads **Urban Transport** An operational pilot EST agency mandated for Vientiane core area A pilot public bus service operating in Vientiane core area	**Indicators** Paved road length increases by 2% per year Backlog in funding of the "Road Maintenance Fund" decreases by 5% per year for the next 5 years Road traffic fatalities decrease by 2% per year Enactment of EST law Enactment of public transport law Enactment of legislation to fund EST pilot project	**Planned Key Activity Areas** Road Maintenance Project Vientiane Sustainable Urban Development Project Institutional and capacity building activities as part of ADB's Sector Governance Project for the Lao PDR (for approval in 2015) **Ongoing Projects** Roads for Rural Development Northern GMS Transport Network Project Second Northern GMS Transport Network Project	**Planned Key Activity Areas** • Support for maintenance of national, provincial, and district roads • Capacity building of MPWT and DPWT staff in road maintenance • Establishment of new Vientiane public bus shuttles and bus maintenance facility • New multistory parking facility and traffic management improvements in Vientiane core area **Ongoing Projects** • Upgrading of 659 kilometers of national roads • Support to integrated development in rural areas • Prefeasibility study for the Vientiane Sustainable Urban Transport Project

ADB = Asian Development Bank, DPWT = department of public works and transport, EST = environmentally sustainable transport, GMS = Greater Mekong Subregion, MPWT = Ministry of Public Works and Transport.

Source: ADB.

Appendix 1
Current Transport System

1. The Lao People's Democratic Republic (Lao PDR) depends primarily on road transport and, to a lesser extent, on river and air transport. This appendix provides a description of each mode in the national transport system, including information on supply and demand characteristics and the current activities of the government to manage or improve the system.

A. Transport Supply and Demand

1. Road Transport

2. **Road network and condition.** Considerable development of the road network in the Lao PDR has occurred over the last 2 decades. The length of the road network has risen from 14,000 kilometers (km) in 1990 to 20,000 km in 1997 and, as shown in Table A1.1 to 35,600 km in 2008. While the Lao PDR's road network is extensive, only 14% of the current road network is paved, including 56% of the national roads and 3% of the total of urban, rural, and special roads.[1] Gravel and earth roads account for 34% and 52%, respectively, of the length of the network. Seasonal closures are frequent due to poor pavement and deficient cross-drainage. Nineteen out of 139 district centers and one-third of all villages (3,500 out of 10,500) do not have year-round all-weather road access.

3. A visual condition survey of the national and provincial road networks was undertaken in 2005, which indicated 80% of the paved roads were in fair, good, or excellent condition, with around 15% in poor or bad condition and around 5% classified as failed. Of the current road network, 12,700 km (mostly earth road but including 1,000 km of gravel road) is considered to be not maintainable[2] because of excessive deterioration. About 20% of provincial roads were classified as not maintainable along with around 11,300 km (60%) of all district and rural roads, which are mostly simple earth construction. Nonmaintainable roads are being progressively upgraded to an engineered standard at a rate of around 1,000 km per year for provincial and district roads, which could eliminate them by 2013. It will take longer to eliminate the backlog of nonmaintainable rural roads.

4. **Current vehicle fleet and growth.** The reported number of registered road vehicles in the country has grown rapidly, rising from 201,000 in 2000 to 430,000 in 2005 and 769,000 in May 2008, a growth rate of just under 20% per annum over the period. Motorcycles account for around 80% of the registered vehicles. For 2007, the Japan International Cooperation Agency (JICA 2008) reported that the vehicle fleet registered in the current urbanized area of Vientiane, Vientiane Capital (i.e., Vientiane

[1] The term "special roads" includes forestry roads, access to special industrial zones, and defense roads.

[2] Roads classified as not maintainable are nonengineered roads providing for movement and access, which often are upgraded to an engineered standard.

Municipality),[3] was 217,000 vehicles, which would likely represent around 260,000 vehicles in 2008. These statistics must be viewed with caution as many vehicles registered in Vientiane are used throughout the nation.

Table A1.1 Length and Surface of Road Network, mid-2008

Road Class	Paved	Gravel	Earth	Total	Maintainable	Nonmaintainable	
						Gravel	Earth
National	3,896	2,078	930	6,904	6,904		
Provincial	287	3,575	3,086	6,948	5,548	350	1,050
District	77	2,381	2,409	4,867	3,117	700	1,050
Urban	469	901	477	1,847	1,847		
Rural	36	2,716	11,525	14,277	4,727		9,550
Special	81	329	304	714	714		
Total Lengths	4,846 (13.6%)	11,981 (33.7%)	18,731 (52.7%)	35,558 (100.0%)	22,858	1,050	11,650

Source: Government of the Lao People's Democratic Republic, Ministry of Public Works and Transport.

5. **Current traffic volumes.**[4] Traffic volumes are generally low but increasing at over 10% annually in line with vehicle fleet growth. In 2007, typical traffic volumes on all-weather national roads were 250–500 motorized four-wheel vehicles per day with similar numbers of motorcycles close to populated areas. Traffic volumes of more than four-wheel vehicles on the main North–South Road No. 13 are typically between 500 and 1,000 vehicles per day, with motorcycles doubling these volumes near settlements. Near Vientiane, four-wheel traffic volumes may be as high as 2,000–4,000 per day, with a similar number of motorcycles, indicating the need for dual carriageway roads.

6. The quantity of traffic on roads with a lower administrative classification is less and includes an even smaller share of vehicles with four or more wheels. Traffic on provincial roads is generally lower (less than 300 per day). Traffic levels on district and rural roads are generally less than 100 per day and as low as 10–25 per day for roads serving individual villages. Traffic on these roads is mostly motorcycles, with a few farm tractors and pick-up trucks. Motorcycles are used primarily for short distances, and their numbers have been increasing by over 20% per annum in recent years. The fleet of small (i.e., two-wheel) agricultural tractors, which have effectively displaced bullock carts, has also grown rapidly. Longer-distance traffic is a mix of trucks (around 30%), buses (10%), and light vehicles (60%).

7. The truck fleet includes four-axle, 12-wheel, rigid vehicles, truck–trailer combinations, 10-wheel general purpose trucks, and many mid-sized, two-axle, six-wheelers. There are some regular long-distance bus services using modern purpose-built vehicles. Local passenger services are operated by converted trucks, pick-up trucks, or *tuk-tuks*.[5] On the provincial and local road networks, small trucks and light vehicles dominate, with large proportions of motorcycles and agricultural tractors. The main implication of the above description is that the present two-lane road network will have the capacity to serve road transport demands for several more years before any significant capacity expansion is required. The

[3] In 2005, approximately 34% of the nation's vehicle fleet was estimated to be registered in Vientiane Capital, which represented just under two-thirds of the total population of the Vientiane Prefecture of 660,000 according to JICA (2008).

[4] This description of traffic volumes is based on text contained in Government of Lao PDR, MPWT (2008).

[5] Three- or four-wheel small motorized vehicles are used for goods or personal passenger transport.

exception is near Vientiane and other major urban areas where some expansion or supporting network enhancement may be required in the near term.

8. **Traffic accidents.** Impressive reductions in road crash fatalities have been observed. The fatality rate per 10,000 vehicles has been reduced from 19.0 in 2000 to 9.5 in 2007, resulting in total fatalities increasing by less than 50%, although the vehicle fleet tripled in the same period. However, loss of life, injury, and property damage due to road crashes are still significant, with 616 people being reported killed in traffic accidents in the Lao PDR in 2008, and the reported total number of accidents being reported as 5,025. The government endorsed a National Traffic Safety Strategy and Action Plan in 2006. In 2007, the National Road Safety Committee with a supporting secretariat in the Department of Transport was established as well as the Road Safety Fund. A systematically formulated road safety program, based on the action plan, has been prepared, but adequate and stable funding for the program is lacking.

9. **Trucking and logistics.** There were about 17,000 trucks (with a weight of more than 2 tons per vehicle) in the Lao PDR in 2003. Around 10% of these appear to be large trucks used for commercial purposes. The truck fleet is aged, with about 50% of trucks more than 20 years old and a majority of the rest more than 10 years old, generally made up of small vehicles with low capacity. Much of the intercity freight, for example of fuel and beer, is carried on own-account vehicles. Trucking services now appear to be provided entirely by private companies, although most have only small fleets. Truck associations are established in all provinces as trade associations, with some government involvement in them. Some of the associations provide guidance on rates, but the industry appears to be generally competitive. The Lao International Freight Forwarder Association was established by Ministerial Decree in 2001 as a trade association and to upgrade professional knowledge and to promote investment in the business of freight forwarding and transport. Transport businesses operating for-hire services (as well as vehicle repair, freight forwarding, warehousing, and depots) are required to obtain a business license from provincial departments of public works and transport (DPWTs) or, for companies with foreign ownership and for companies making large investments, from the Ministry of Public Works and Transport (MPWT).

10. In nonurban areas, the principal concern with regard to traffic operations has been, and is likely to remain, truck overloading because of the damage caused to roads and road safety concerns. Truck overloading, although having significantly declined in recent years due to increased enforcement, can be a specific problem in localized areas, for example, close to quarries, mines, or cement factories and timber extraction, often in remote areas. The government has operated an enforcement program since 1999 that has involved the weighing of around 80,000 trucks per year and payment to the Road Maintenance Fund (RMF) of a share of the charges and fines imposed on overloaded vehicles. DPWTs operate the weigh stations and enforce overloading fines. The share of trucks that were overloaded was once pervasive, at 96% in 1999. The rate was reduced to 30% in 2002, but there has been a less substantial decline since that time. Containing and further reducing overloading, and ensuring that fines and charges are set at an appropriate level and that revenue is fully accounted for, will require a reinvigorated program. There is also a need to review and refine current load standards to overcome current definitional limitations and to facilitate the movement of trucks from neighboring countries.

11. Under the 2004 Greater Mekong Subregion (GMS) Cross-Border Transport Agreement between the Lao PDR, Thailand, and Viet Nam, cross-border trade is facilitated. Designated routes, transit traffic regimes including exemptions from physical customs inspection, exchange of commercial traffic rights, and infrastructure including road and bridge design standards are specified. The carriage of hazardous goods is also regulated.

12. Routes 3, 4, and 9, which have been upgraded since 2004, and are part of the GMS corridors, have been designed to a new infrastructure standard and are able to take higher axle loads (9.1 tons rather than 8.2 tons as on the rest of the domestic network). DOT has identified the need to have a formal permit system for vehicles carrying much higher mass loads, such as construction equipment or other special commodities

provided corresponding charges reflecting a shortened road life can be levied. The current system of giving mass limit exemptions is informal. At the same time, weigh stations do not generally inspect vehicles for dimension limits or roadworthiness, and there does not appear to be any existing procedures for testing and certification of weighing devices used for the enforcement of vehicle weights.

13. JICA is presently supporting DOT to develop a comprehensive logistics strategy for the period to 2025, mainly focusing on national truck transport. The study is developing logistics concepts involving truck terminals and associated facilities in Bokeo, Khammouane, Luang Namtha, Luang Prabang, Pakse (Champasak), Savannakhet, and Vientiane. Emphasis is being placed on the development of Thanaleng, the former private truck terminal located near the Thai–Lao Friendship Bridge (close to Vientiane), and terminals in Savannakhet as a GMS East–West Corridor hub and Champasak as a trading hub to Cambodia, Thailand, and Viet Nam.

14. **Vehicle fuels, emissions, and air quality.** The majority of aged diesel-fueled vehicles, such as trucks and buses, are imported from Thailand or other neighboring countries. Old trucks and buses, almost all of which make use of pre-European emission standards (EURO) emissions technology, are high polluters of fine particulate matter, which is harmful to human health. The Lao PDR imports all of its fuel from Thailand and regional refineries. Current standards for fuel quality regulate the specification of sulfur in diesel fuel and lead in gasoline as shown in Table A1.2. The lead content in fuel indicates that leaded fuel is still permitted in the Lao PDR although it appears that most gasoline sold in the Lao PDR may actually be lead-free as officially it is imported from Thailand, which phased out leaded gasoline in January 1996. At a minimum of 0.5% by weight or 5,000 parts per million, the maximum sulfur content is high and well above the 500 parts per million needed for EURO 2 specification vehicles. At the same time, some illegal importing of fuels of unknown quality may occur as well as adulteration of fuels. These practices lower the quality of fuels used.

Table A1.2 Maximum Lead and Sulfur Content of Fuels

Fuel	Sulfur	Lead
Industrial diesel oil	1.5% (15,000 ppm)	
High speed diesel type 1 or 2 for vehicles	0.5% (5,000 ppm)	-
Petrol	-	0.15g/l

g/l = grams per liter, ppm = parts per million.

Source: Lao Standards (2001a and 2001b).

15. Within Vientiane, vehicles are inspected by one state enterprise and three private companies operating under 1-year concessions awarded by a municipality's DPWT. There is very little information available on the quality of inspections, but it is understood they focus only on basic safety aspects with no emissions measurement. The short duration of the concessions militates against any substantial investment in appropriate equipment. In addition, many vehicles are not tested, although testing is required by law.[6] It is understood that a similar system for vehicle inspection is adopted in each province.

16. With the support of Danish International Development Assistance, the Environmental Quality Monitoring Center, under the Science, Technology and Environment Agency, undertook limited air quality sampling during 2002–2004 for particulate matter of 10 microns in diameter or less, which showed a range of concentrations of 40–179 micrograms per cubic meter ($\mu g/m^3$) with an average of

[6] Vehicles imported new into the country are to be inspected every 2 years, while imported used vehicles are to be tested once each year.

all 30 measurements of 87 μg/m^3. Compared to the 2005 World Health Organization 24-hour guideline update (50 μg/m^3) only four (13%) of the measurements comply with the standard. The Clean Air Initiative Asia (2006) also reported that only 8 of 29 of the sulfur dioxide measurements in Vientiane (27.6%) complied with the World Health Organization 24-hour guideline of 20 μg/m^3. It was concluded that sulfur dioxide was an issue but less so than particulate matter. Measurements of nitrous oxide did not indicate a problem.

17. Apart from diesel-powered vehicles, particulate matter results from open fires, cooking, garbage burning, and slash-and-burn cultivation, plus resuspended road dust. Air pollution is particularly noticeable in the dry season, March to May. There is no comprehensive emissions inventory, so the relative contribution of each pollution source to air quality is unknown. However, due to the lack of intensive industry, mobile sources are likely to be the most significant contributor to air pollution.

18. **Interurban bus services.** There is a substantial number of intercity bus services in the Lao PDR, mostly radiating from Vientiane. The key issue is the appropriate level of regulation to facilitate innovation and new investment while improving safety and quality. Route lengths are up to 900 km, and both standard and premium quality services are provided. The government has a significant role in the intercity bus industry through public ownership of the State Bus Company and bus terminals setting maximum fare levels, registering companies providing bus services and licensing of bus services, and participation in route associations. In 2004, eight private companies provided intercity bus services in addition to the State Bus Company, with the latter accounting for around 40% of bus-kilometers of service. Provincial and local bus services are provided by smaller vehicles. While these services are provided within a similar regulatory framework to that for intercity buses, regulatory controls may not be applied strictly. In addition to passenger travel, public transport is used to carry goods to markets. The national Passenger Transport Association was established by Ministerial Decree in 2003 as an industry association. Passenger transport associations are also present at the provincial and district levels. The associations submit proposals to the government on routes, frequencies, and fares, and facilitate the provision of services by their members.

19. The number and diversity of international bus services have grown considerably since the first services between Vientiane and Nongkhai and Udon Thani in Thailand commenced in April 2004. International services from the Lao PDR are now provided to six cities in Thailand, five cities in Viet Nam, and also to Kunming in the People's Republic of China (Table A1.3). The number of services has demonstrated the potential demand for such cross-border travel, ability of the bus industry to respond to the demand, and improvements in cross-border transport administration that has facilitated the services.

Table A1.3 International Bus Services to and from the Lao People's Democratic Republic

From	To		Distance kilometers	Frequency trips per week
	City	Country		
Vientiane	Bangkok	Thailand	637	7
	Nongkhai		22	28
	Udon Thani		75	28
	Khon Kaen		188	7
	Ha Noi	Viet Nam	824	7
	Danang		920	14
	Ho Chi Minh City		1,800	2
	Kunming	People's Republic of China	1,400	1
Thakhek	Dong Hoi	Viet Nam	484	7
	Danang		571	2
Luang Prabang	Vinh	Viet Nam	486	3
Savannakhet	Daesavan	Viet Nam	236	21
	Danang		498	7
	Ha Noi		879	1
Pakse	Chong Mek	Thailand	48	7
	Udon Ratchatani		128	14
	Danang	Viet Nam	702	7

Source: Government of the Lao People's Democratic Republic, Ministry of Public Works and Transport.

2. Rural Access

20. Eighty percent of the population lives in rural areas while up to 90% of poverty in the Lao PDR is estimated to occur in rural areas. The very poor live in remote areas where road and other infrastructure is scarce.

21. An estimated 3,500 villages, with a population of 1 million people, do not have adequate year-round access. Although rural villages may be very small, Party Instruction No. 9/CPPB dated 8 June 2004 calls for integrated urban development through the creation of *kum ban*, which typically comprises 4–15 villages connected to each other by walking paths, ethnicity, and trade. One village is nominated as the *kum ban* center. Village consolidation is an integral part of the government's policy to promote permanent settlements and eradicate shifting cultivation. The policy affects mainly minority ethnic groups who have traditionally lived migratory lifestyles, moving their villages periodically in response to disease, natural disasters, or spiritual beliefs.

22. Rural access improvement was identified as a priority in the National Growth and Poverty Eradication Strategy and the Sixth National Socio-Economic Development Plan. Access to markets and services is regarded by the government as essential to eradicate poverty. Consequently, the government seeks to provide adequate basic access, with basic access having the following attributes: (i) an all-weather road suitable for farm tractors and motorcycles and not general traffic, (ii) an unpaved and likely narrow road, (iii) constructed and maintained by local communities, and (iv) be supported by village consolidation. In some areas, it is recognized that appropriate basic access could be provided by footpaths or waterways.

23. Under the road categories defined in the 1999 Roads Law, district roads and rural roads[7] have a key role in rural access. They connect either from district centers to villages or from villages to villages. There are an estimated 4,900 km of district roads, of which roughly half are gravel and half are earth, and 14,000 km of rural roads, of which 20% are gravel and 80% earth. The adequacy and quality of access to rural villages depend on the coverage and condition of these roads, but also on provincial and even national roads, and there are remaining gaps and deficiencies in these networks. In some areas, along waterways, adequate river transport facilities, with appropriate hinterland access, are important for rural access.

24. The National Growth and Poverty Eradication Strategy targets for road access called for 80% of districts to be linked to provincial capitals by all-weather roads in 2005. The policy on Rural Development and Poor-District Focus proposed improving access to the essential factors of development, including production inputs, markets, human resources, social services, and rural finance. The 72 poorest districts were identified, with 47 of them selected for priority investments. Targeting the 47 districts was intended to address the complex problems of poverty, gender, and ethnicity.

25. The recent poverty and social impact analysis undertaken by the World Bank and European Commission (2008) looks at the government policy to target poverty reduction efforts at the 47 poorest districts, which are also the districts rich in both natural resources and ethnic diversity.

26. The analysis found that "social and poverty differences measured in terms of human development, and based on gender, are substantially higher among rural communities than urban ones, and especially among the non-Lao-Tai ethnic groups."

27. There appears to be a complex relationship between provision of roads and reduction of poverty. The benefits of roads would seem to be more significant where improved access is strongly linked to direct provision, and timely coordination, of other health, education, and employment generation services. Further, the Asian Development Bank (ADB) postulated that improvement of roads could increase the economic inequality between ethnic groups. Integration and coordination of service delivery in rural areas appears to be more easily achieved where rural roads are provided as part of agriculture development projects.

28. Chamberlain's (2006) study comparing improvements in poverty between villages in 2000 and the same villages in 2006 in the priority poor districts found that "roads have little commercial value to poor villagers if they are unable to produce goods for the market because of lack of suitable land". However, the study noted that the villages were appreciative of the improvements and that there was "… some improvement... in infrastructure for transport, classrooms, and health clinics." It was also observed that more poor villages are now found next to roads, compared with the 2000 survey, though many roads are not readily passable during the wet season.

29. The analysis identified that in terms of service delivery "overall and within each community, villagers who had been resettled ranked service quality as follows: best clean water, then drug kit, then primary school, next the road, then human and worst animal vaccination." It was found that roads also benefit villagers who can take advantage of the road but also provide access for private interests, and who through asymmetry of information may take unfair advantage of villagers. Land was confirmed as the major asset of poor households in the priority districts; a major factor in whether families can make the transition to a new settlement or production model is whether they have access to land for agriculture.

[7] Under the Roads Law, district and rural roads are two categories of local road. The other local road categories are provincial and special roads. The other road category defined under the Roads Law is national roads.

30. Achievement of the goal of provision of universal basic access will take a major and sustained effort in both provision of capital for investment,[8] and support to the development of local capacity for planning, implementing, and maintaining access improvements. However, addressing rural poverty requires a comprehensive approach—roads have a role but so do water supply improvements; complementary and integrated development, for example, of irrigation improvements with road and market place improvements; and the provision of essential public services. Leveraging the benefits of rural access may be enhanced by adoption of an integrated model for service delivery as in the case of agricultural projects. It would seem this approach may be worth replicating but would not translate necessarily to other sectors. Stability and continuity of donor assistance and government programs could be expressed in rolling programs of MPWT—that is, a program-based approach within a medium-term budget as required by the new budget law may be able to achieve the same or a better result.

3. Waterway Transport

31. Of the major rivers in the Lao PDR, the Mekong River is the most substantial, running for about 1,865 km from the border with the People's Republic of China (PRC) in the north to the border with Cambodia in the south. Transport services are concentrated on the Mekong River but also occur on its larger tributaries, the Nam Ou and Se Kong, and on the Nam Ngum reservoir.

32. There are 21 landing ramps along the Mekong River. Lakse Port in Vientiane is the largest of these, accommodating 20,000–30,000 tons of freight movement per annum. Ports at Huaisai, Luang Prabang, and Pak Beng each have annual freight movement of about 10,000 tons, with lesser levels of demand at other ports.

33. The capacity of much of the river is being developed to accommodate larger vessels, although dry season flow reductions and natural barriers limit the potential of higher-capacity vessels. Much of the Mekong River is limited to vessels with capacity of only 30 tons during the dry season because of limited water depth (Table A1.4). Recent improvements allow 100–150-ton ships to navigate year-round between the PRC and Houayxai. Between Luang Prabang and Vientiane, the river is navigable all year but has difficult sections. The main barrier along the Mekong is the Khemarat rapids between Savannakhet and Pakse, which completely close the river to dry season transport and severely limit rainy season navigability. In the Pakse–Don Deth section, navigation is easy to the Cambodia border where the Khone Falls are an impassable obstacle.

34. Vessels of 300 tons or greater capacity carry such products as sand, rock, wood products, food grains, steel products, and logs. The majority of the traffic is domestic, but international traffic is important on the upper section among the PRC, the Lao PDR, Myanmar, and Thailand. Since the national road 13S was improved, river freight traffic between Vientiane and Savannakhet has declined.

35. The Department of Inland Waterways was recently established in the MPWT. Currently, the department is preparing a strategy for the development of inland waterways. It is understood that the strategy will determine what the realistic potential role of inland waterways for passenger and freight traffic could be and to propose an investment plan for upgrading shore-based facilities, including terminals.

[8] Taking into consideration only district and rural roads, $16 million per annum (World Bank 2008) for several years is needed to clear the estimated maintenance backlog and upgrade roads that are presently described as "unmaintainable" roads, which for initial assessment purposes may be regarded as a surrogate of the needed maximum investment to provide universal basic access. The World Bank (2008) also presented an alternative upper estimate of $200 million as the rural access deficiency based on the road development plan for district roads put forward by MPWT.

Table A1.4 Suitable Vessel Capacity in the Mekong River in the Lao People's Democratic Republic

River Section	Trip Length (kilometer)	Boat Capacity (DWT in 2004)		
		Dry season (current)	Wet season	
			Current	Possible 2010
PRC border–Huaisai	220	30[a]	150	300
Huaisai–Luang Prabang	300	30	150	300
Luang Prabang–Vientiane	430	30	150	150
Vientiane–Thakhek	370	50	300	300
Thakhek–Savannakhet	90	30	300	300
Savannakhet–Pakse	260	Na	50	50
Pakse–Don Deth	160	30	100	100

DWT = dead weight tonnage, PRC = People's Republic of China.

[a] Recent improvements allow year-round use by 100–150-ton vessels.

Source: Government of the Lao People's Democratic Republic, Ministry of Public Works and Transport.

4. Air Transport

36. There are scheduled services to 10 of the 11 airports in the Lao PDR that have sealed runways. Three of the airports (Vientiane, Luang Prabang, and Pakse) can accommodate jet aircraft. There are a further 39 airstrips. Overall demand has been modest, with 0.4 million passengers at Wattay Airport in Vientiane and 0.1 million passengers at Luang Prabang in 2002, and average demand of 14,000 passengers per airport at other locations.

37. There has been considerable development of aviation services in recent years. The Lao PDR is now served by six airlines (i.e., Air Asia, Bangkok Airways, China Eastern Airlines, Lao Airlines, Thai Airways, and Vietnam Airlines). The number and diversity of international services has increased considerably, with services now available at Vientiane, Luang Prabang, and Pakse. There are direct international services between Vientiane and Thailand (Bangkok), Viet Nam (Ha Noi), Cambodia (Phnom Penh, continuing on to Ho Chi Minh City in Viet Nam), Malaysia (Kuala Lumpur), and the People's Republic of China (Kunming); between Luang Prabang and Thailand (Bangkok, Chiang Mai, and Udon Thani), Cambodia (Siem Reap), and Viet Nam (Ha Noi); between Pakse and Cambodia (Siem Reap); and between Savannakhet and Thailand (Bangkok).

38. Domestic air services by Lao Airlines use ATR or MA60 aircraft between Vientiane and Luang Prabang, Pakse, Xiengkhuang, Oudomxai, Huaisai, Luang Mantha, and Savannakhet; between Luang Prabang, Huasai, and Xiengkhuang; and between Pakse and Savannakhet. During the rainy season, additional flights are made to access-limited locations. Another state-owned airline (Lao Air) flies 10-seat Cessna aircraft on a regular basis to three remote provinces: Houaphan, Phongsali, and Xingabury. In addition, there is a privately owned charter helicopter service.

39. MPWT's Department of Civil Aviation is currently finalizing a comprehensive master plan for air transport that addresses the future development of this transport mode. The master plan identifies and specifies the regulatory, safety, administrative, and capital investment requirements that will be progressively introduced and implemented. In particular, the impending "open skies policy" to be introduced in 2010–2011 in accordance with the government's membership commitment in the Association of Southeast Asian Nations (ASEAN) is incorporated in the master plan. This master plan is an update of an earlier one prepared by ADB in 2004.[9]

[9] ADB. 2009. *Completion Report: Preparing the Northern Airports Improvement Project in the Lao PDR*. Manila.

5. Railways

40. A 3.5-km extension of the rail network in Thailand from Nongkhai to a terminal at Thanaleng on the outskirts of Vientiane via the Friendship Bridge was opened in July 2008. Two passenger train services are provided daily in each direction at present, with connecting train services to Bangkok. There is potential for freight services in the future subject to sufficient demand. A further 10-km extension of the line to Ban Kham Sa Vat in northern Vientiane is being considered. The government is pursuing three additional railway lines: (i) a route for a railway line from Vientiane to Savannakhet, (ii) from Thakhek to Kuemuay at the border with Viet Nam, and (iii) from Savannakhet to Laobao at the border with Viet Nam. Limited traffic volumes and difficult terrain are major impediments to the further general development of railways in the Lao PDR.

41. The government wishes to increase the use of the existing railway by its attractiveness for securing container transport from Thailand to Vientiane. With regard to the development of a GMS railway network, the government's focus is on the proposed railway link between Singapore and Kunming via Luang Prabang.

6. Urban Transport

42. Vientiane Capital is the largest city in the Lao PDR, with a 2005 population of 422,000 and another 200,000 people estimated to be living in adjacent mainly rural areas that form the balance of Vientiane Prefecture. The population of the prefecture has been growing at 3.3% per annum mainly due to in-migration. The Vientiane Urban Development Administration Authority provides services to Vientiane Capital and the three predominantly rural districts within the prefecture, Naxaythong, Pakgnum, and Sangthong.

43. Other cities have populations typically less than 50,000 people; most have fewer than 20,000. Luang Prabang, Pakse, and Savannakhet are the three largest cities after Vientiane. Urban transport needs are met mostly by walking, private motorized transport (in particular motorcycles), and for-hire *tuk-tuks*.[10] There are a few scheduled public transport services in Vientiane provided by the State Bus Company and a limited number of standard taxis in the city. There are few formal public transport services in other urban areas.

44. Within Vientiane, significant investments have been made in improving urban roads and bridges in recent years as reported by the recent transport master plan. Many proposed improvements were accelerated to support the Southeast Asian Games in December 2009. Despite the road improvements, Vientiane's traffic congestion is increasing in peak periods although still at a relatively low level. With rapidly increasing motorcycle and vehicle ownership, improving infrastructure and faster speeds, poor driver discipline, and little regard for safety helmets (now mandated by law), road crashes are increasing. In Vientiane in 2006, 119 fatalities and 3,572 total injuries were recorded, although the absolute numbers of fatalities and injuries have remained stable against a background of significant traffic growth. The near-term outlook is for increased congestion and emissions as traffic growth continues.

45. The State Enterprise Vientiane State Bus Company provides both urban buses in Vientiane and intercity bus services. Currently, it operates 51 buses on urban routes, and patronage is declining. A private bus company, Thong Li Si Pa, started operating limited urban bus services in 2007. There are 2,090 *tuk-tuks*, 262 *song taew*,[11] and 132 taxis also operating in the city. The current modal share in terms

[10] Three-wheel motorized vehicles using a motorcycle as the motive unit, drawing a small passenger carriage seating up to 10 persons.

[11] Pick-up trucks with a covered passenger cabin containing two facing benches for passenger seating.

of daily person-trips according to JICA (2008) is 25% on foot or bicycle, 60% by motorcycle, 4% by public transport, and 11% by car.

46. Observations indicate that walking conditions in central Vientiane are fair at present,[12] possibly due to upgrading for the Southeast Asian Games. Footpaths are usually provided and, in many parts of the city, are in good condition. In future, the challenge will be to retain the current standard of walkability and protect cyclists from undue risk while expanding the role of nonmotorized modes in future as motorization continues.

47. JICA's master plan includes an extensive program of road investments to 2025 along with a balanced program of sustainable transport improvements focusing on bus service improvements, and enhancements of conditions for walking and cycling. Nevertheless, more than 90% of the proposed transport investment is directed to roads.

48. In 2010, JICA funded a project to enhance the urban operations of the Vientiane State Bus Company. This project takes the form of support to bus planning and operations and business planning. JICA is planning to grant the provision of 40 low-floor, 55-seat, air-conditioned buses to operate a service between the central bus station at Dongdok and the National University of the Lao PDR. The aim of the bus service is to serve the university better, thus providing an alternative for students who would otherwise have to buy motorcycles, but also to demonstrate the sustainable transport policies set out in the transport master plan.

49. Separately, JICA is planning to assist MPWT's Public Works and Design Institute to extend the current Vientiane Urban Development Plan to cover the newly urbanizing districts within Vientiane.

B. Revenue Mobilization and Road-Use Charges

50. Road expenditures are currently mainly financed by the RMF, the government's budget allocations, and foreign loans and grants. The funding resources of the RMF have increased considerably since the establishment of the fund in 2001 following a substantial rise in the fuel levy. Road funding will be further enhanced by expected future increases in the fuel levy and, from the 2010–2011 fiscal year, by the allocation of a share of revenue from the Nam Theun 2 Hydropower Project, a portion of which will be dedicated to improving rural accessibility. Even when combined with other domestic resources, the government needs $50 million per annum from international development partners to sustain its desired road expenditure program (Appendix 3). The government intends for all road funding, including donor funding where appropriate, to be administered and disbursed through the RMF. The government has strengthened its ability to finance road expenditure from domestic resources, with, for example, the RMF's own-source revenue expected to be sufficient to fully fund the cost of road preservation, including maintenance, by 2012. A sustained focus on resource mobilization, especially from domestic sources, will be needed to maintain the momentum developed in recent years.

C. Government Administration

51. National government activities in the transport sector are undertaken primarily by MPWT. Divisions in the MPWT with operational responsibilities are the Department of Roads (DOR), DOT, Department of Civil Aviation, Department of Inland Waterways, and the Railway Authority, as indicated

[12] Observations made by UNEP (2008) were that pedestrian facilities were poor and often obstructed.

in Table A1.5. The Department for Planning and Cooperation in MPWT is responsible for overall management of development assistance programs. Traffic enforcement is undertaken by the Traffic Police Department in the Ministry of Public Security. The RMF, established in 2001, uses hypothecated revenue from, primarily, a levy on fuel and also a heavy vehicle surcharge, fines for vehicle overloading, and other tolls and fees to finance road maintenance. The Ministry of Finance continues to play a major role in financing transport sector activities through the national budget. Urban roads are the responsibility of urban development administration authorities, which are responsible to their provincial governments and, in the case of the Vientiane Urban Development Administration Authority, to Vientiane Prefecture. These authorities differ from other provincial departments as they are empowered to levy and collect revenues. Some RMF funds are directed to urban roads.

52. The government is committed to decentralization, which is sometimes referred to as delegation of powers and functions that are best carried out at a provincial or district level, close to local communities. A division of DPWT is located in each of the country's 18 provinces. Each DPWT is responsible to the governor of the province, with MPWT also providing direction, guidance, and support. DPWTs are, in turn, supported by an office of public works and transport (OPWT) in each district center in a province. A traffic police office in each province provides an equivalent arrangement for traffic enforcement.

53. Responsibility for the prioritization of construction, and subsequently for undertaking maintenance, of rural transport infrastructure rests with provincial governments supported by the districts, and in close consultation with local communities using the community road model. The role of the central government through DOR is to ensure an appropriate and justified allocation of national funds to support the overall objective of improving rural accessibility as a means of addressing rural poverty. DOR provides technical support and capacity building to the provincial DPWTs and district OPWTs to perform their technical work effectively and efficiently, and by collaborating closely with them to ensure quality control and value for money.

Table A1.5 Institutional Arrangements in the Transport Sector

Function	Subsector			
	Road[a]	Aviation	Waterway	Rail
Policy	DOT, DOR	DCA	DOW	DOT, RA
Infrastructure				
- Planning[b]	DOR	DCA	DOW	RA
- Construction preparation and management	DOR, DPWT	DCA	DOW	RA
- Maintenance management	DOR, DPWT	DCA	DOW	RA
- Delivery of works and maintenance	Mix of private sector contractors and SOEs	Private sector contractors and own staff	Mainly private sector contractors and some SOEs	Mainly private sector contractors
- Operation	DPWT	DCA	DPWT	SRT
- Financing	MOF, RMF, donors	MOF	MOF	MOF and donor
Transport services				
- Provision	Private sector and one SOE (State Bus Company)	SOE (Lao Airlines) and international airlines	Mainly private sector	SRT
- Regulation and enforcement	DOT, DPWT, TPD, TPO	DCA	DOW, DPWT	RA
- Safety	DOT, DPWT	DCA	DOW, DPWT	RA

DCA = Department of Civil Aviation, DOR = Department of Roads, DOT = Department of Transport, DOW = Department of Inland Waterways, DPWT = Department of Public Works and Transport, MOF = Ministry of Finance, RA = Railway Authority, SOE = state-owned enterprise, SRT = State Railway of Thailand, TPD = Traffic Police Department, TPO = Traffic Police Office.

[a] Urban roads are the responsibility of urban development administration authorities, which receive technical assistance from DPWTs and some financial assistance from the Road Maintenance Fund in addition to their own sources of income and funding.

[b] The Department of Planning and Cooperation takes on overarching role through its work in coordinating the Infrastructure Sector Working Group.

Source: ADB.

54. The population of the Lao PDR and the corresponding size of the government results in agencies of limited size. While now somewhat larger, in 2004 DOR and DOT in MPWT had a total staff of 180 people, with an average of 10 people in each of the divisions in the two departments. One-third of the staff held professional qualifications. DOR staff have developed considerable technical capacity through assistance in conjunction with road investment projects, in particular in the fields of engineering and project and financial management. DOT, which undertakes more multifaceted tasks, has received less assistance. The small size of the divisions in the two departments limits the scope of staff to develop backup skills. Training programs need to respond by developing generic skills and with ongoing programs to train new staff with specific skills. Decentralization places greater demands on provincial DPWTs and local OPWTs, which in 2004 had an average number of permanent staff of 50 and 3, respectively. It is likely that there will be a need for MPWT to provide continuing training and support for regional staff to develop their skills to undertake road construction and maintenance and, over time, more complex tasks.

55. The current system of road and transport administration has been developed over many years by MPWT in conjunction with ADB and other development partners. In regard to roads, the administrative structure provides the key functions needed by a modern road authority with an appropriate separation of strategy and policy making from road construction and maintenance. Sufficient capacity to fully discharge the necessary functions, particularly at provincial and district levels, is the main challenge as has been recognized by major donors and MPWT.

56. For all districts in the country, MPWT's Department of Housing and Urban Planning is responsible for planning very basic structure plans identifying current constraints, the proposed land-use arrangement, and needed infrastructure, although it does not consider the feasibility of the proposals. The plans are prepared by MPWT's Public Works and Transport Design Institute. Implementation of the plans is mainly done through the 5-year planning mechanism in which provincial priorities are implemented within the prevailing budget constraints.

57. Funding from year to year for road and other transport investments is uncertain because, despite the preparation of an MPWT strategy and the government's 5-year plan, actual funding is handed down as 1-year annual work programs, which increases the need for provinces to compete for funds each year and reduces the ability of transport and other sector agencies to know which roads will be funded and to coordinate the delivery of health, education, and other services at the community level, which could benefit from road provision. Similarly, with more certain forward investment programs, including capital and operating and maintenance needs, donors would also find it easier to plan and coordinate their sector assistance. The problems are compounded as government revenues have fluctuated in the past due to the reliance on royalties from resource extraction and donor assistance. Further, the national 5-year plan prepared by the Ministry of Planning and Investment does not take into account operating and maintenance costs and other life-cycle costs, e.g., of replacement, which must be eventually funded by the Ministry of Finance.

58. The Infrastructure Sector Working Group, established in 2008, facilitates policy dialogue on key sector issues and the building of an effective partnership among development partners, including coordination of assistance programs, and it supports the execution of the country action plan of the Vientiane Declaration on Aid Effectiveness. The working group is jointly chaired by ADB and the Government of Japan, and includes other multilateral and bilateral development partners. It has a secretariat in the the Department of Planning and Cooperation. The government also participates in regional institutions that have specific transport programs, including the GMS, through which it is a party to the cross-border transport agreement, and ASEAN, which has among other matters recommended regional truck load limits and supports the development of regional transport networks.

59. National interagency coordination and consultation is through the National Transport Committee, which was established in 2002 and has a secretariat in DOT. It comprises representatives

of ministries of finance, commerce, foreign affairs, and public security as well as MPWT and transport industry representatives. The committee addresses a range of issues, including planning transport services; setting maximum transport tariffs; establishing standards for road vehicles; coordinating government activities; acting as a focal point for international agreements and agencies that influence transport operations in the Lao PDR (e.g., ASEAN, GMS, and various United Nations programs); assessing the benefits of acceding to international agreement and conventions; and coordinating, implementing, and monitoring the Lao PDR's activities under agreed international agreements. The law under which the committee was established allows establishment of transport committees at provincial, municipal, and special zone levels to give advice on transport operation, determine routes and transport prices on the basis set out by MPWT, and encourage enforcement of laws and regulations.

60. The Lao PDR acceded to the United Nations Framework Convention on Climate Change in 1995 and is a signatory to the Kyoto Protocol to which it acceded in 2003. The Department of Environment in the Water Resources and Environment Agency has been appointed as the framework and Global Environment Facility national focal points for the Lao PDR.

D. Legal Framework

61. Three primary statutes govern road transport in the Lao PDR: (i) the Road Law, which addresses the management and use of public roads and assigns roads to MPWT, DPWTs, OPWTs, and village authorities in accordance with the country's decentralization of responsibilities; (ii) the Road Traffic Law, which deals with the control of traffic, vehicles, and vehicle use (including vehicle loading) and drivers to ensure orderly and safe road use; and (iii) the Road Transport Law, which provides the regulatory framework for the operation of domestic, cross-border, and transit goods and passenger transport, covering such matters as drivers, vehicles, vehicle repair workshops, insurance, and road transport businesses, including freight forwarding. MPWT operates patrols to enforce its obligations under the Road Transport Law.

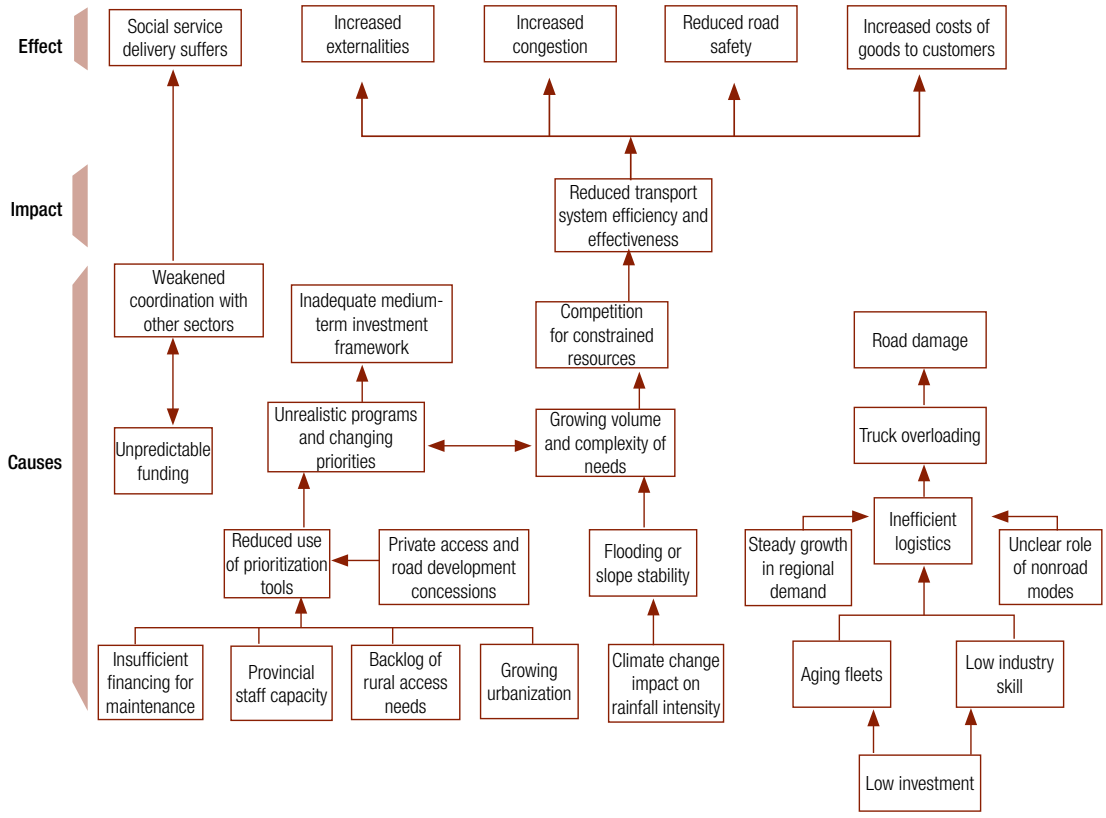
62. The provisions of the laws are made more specific in subsidiary laws, such as on maximum vehicle weights and dimensions, and in decrees and rules of MPWT. DOT is responsible for managing the statutes. At the national level, enforcement is the responsibility of DOT other than with regard to traffic management, which is enforced by the Traffic Police Department, with implementation undertaken at the provincial and local levels. CAI-Asia (2006) reported that there was no specific legal framework for air quality management in the Lao PDR. New standards for ambient air quality have been drafted and discussed and were broadly agreed to at a workshop held in Vientiane in December 2009, but they have not been brought into law. Even if brought into law, there are no comprehensive means and resources for implementation, including effective enforcement.

E. Industry Development

63. The national socioeconomic development plan identifies promotion of private sector capability as a key agent of economic development. Within the transport sector, the development of competent consultants, construction firms, and transport operators is desired by MPWT and has been supported by donors for several years. With improvements in the business environment and simplification of regulatory requirements, progress is being made. MPWT, with donor support, has been able to encourage growth of private contracting firms, some of which are offshoots of former state-owned enterprises. Currently, these firms lack technical and commercial experience and have limited financial capacity for purchasing equipment and funding working capital. However, the quality of their work, and that of the local design

and supervision consultants, is increasing. To facilitate further improvements in capacity and the breadth of local consulting firms and contractors requires increasing the volume and complexity of work for which they are eligible. Bray and Johnson (2004) pointed out that where practicable, targeting contracts in the $0.3 million–$0.5 million range and making them accessible to local private companies, but also encouraging companies to form consortiums to undertake larger contracts, would increase capability and encourage industry consolidation. Further, a more stable flow of work would enable firms to retain skilled staff and more effectively utilize equipment.

Appendix 2
Problem Tree



Source: ADB.

Appendix 3
Estimates of Financial Requirements for Road Subsector Investment, 2011–2015

1. This appendix is based on a translation of available data tables contained in the Ministry of Public Works and Transport (MPWT) strategy for the road subsector, 2010–2020 as part of its submission to the Ministry of Planning and Investment for preparation of the Seventh National Socio-Economic Development Plan.

A. Funding Availability to 2015

2. At present, road funding relies on several sources, including government revenues, in particular road-user charges (mainly through a special fuel levy per liter of fuel sold) and toll collection, which are managed by the Road Maintenance Fund (RMF) and donors. With increasing demand for fuel and scheduled increases in the fuel levy in the future, the government contribution toward road funding is expected to increase substantially over time. In 2010, RMF generated KN166 billion (or $18.4 million) in 2007–2008, which expected to rise to an estimated KN513 billion ($57.0 million) in 2014–2015.

3. From fiscal year 2010–2011, the government will also provide substantial revenue from the NT-2 Hydropower Project, part of which will be dedicated to roadworks. While MPWT has assumed that the total of the expected revenues from NT-2 will be available for roadworks, mainly rural roads, this appears not to be the case. In fiscal year 2009–2010, the roads received only KN15 billion (or $2 million), representing 30% of NT-2 revenue. Part of the reason for the reduced revenue availability for roads was that NT-2's commissioning was delayed and there is competition from other sectors for the funds. The government is also trying to mobilize potential resources from natural resources development concessionaires for road funding.

4. Table A3.1 shows the estimated annual funding by source, although the figures for NT-2 seem unlikely to materialize for the reasons stated above. Based on the estimates shown in Table A3.1, KN5.871 trillion ($652.3 million) is projected to be available during 2010–2011 to 2014–2015, although as stated above, this includes what appears to be an overly optimistic reliance on NT-2 funds.

B. Proposed Roadworks

5. There are two broad types of roadworks: (i) maintenance and preservation of the existing road system, including routine maintenance, periodic maintenance, and rehabilitation; and (ii) upgrading and expanding the road system.

6. Table A3.2 shows that estimated total annual budget needed for road maintenance and preservation based on use of the MPWT's Road Maintenance System is KN285.16 billion, of which—based on 2009 estimates of MPWT—approximately 65% of the total is for periodic maintenance. Consequently, the total need for road maintenance and preservation over 2010–2011 to 2014–2015 is KN1.425 trillion ($158.3 million), equivalent to 24.3% of the total estimated available budget.

Table A3.1 Estimated Funding for Road Investment in the Lao People's Democratic Republic to 2015 (KN billion)

Revenue Source (by fiscal year)	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015	Total
Government Funding								
1. Direct funding	166	182	200	220	250	275	300	1.593
2. Road maintenance	180	225	270	324	378	441	513	2.331
3. NT2	-	90	90	90	90	90	90	540
Subtotal Government	346	497	560	634	718	806	903	4.464
Donor Funding	450	450	450	450	450	450	450	3.150
Grand Total	**796**	**947**	**1.010**	**1.084**	**1.168**	**1.256**	**1.353**	**7.614**

NT2 = Nam Theun 2 Hydropower Project.

Source: Government of the Lao People's Democratic Republic, Ministry of Public Works and Transport (2010b), Table 6.

Table A3.2 Annual Cost to Maintain and Preserve Existing Road System in the Lao People's Democratic Republic (KN billion)

Fiscal Year	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
National roads	138.50	138.50	138.50	138.50	138.50	138.50	138.50
Provincial roads	55.01	55.01	55.01	55.01	55.01	55.01	55.01
District roads	23.93	23.93	23.93	23.93	23.93	23.93	23.93
Rural roads	35.39	35.39	35.39	35.39	35.39	35.39	35.39
Urban roads	28.97	28.97	28.97	28.97	28.97	28.97	28.97
Special roads	3.36	3.36	3.36	3.36	3.36	3.36	3.36
Total	285.16	285.16	285.16	285.16	285.16	285.16	285.16

Note: Above totals per annum are revised from the total of 280.40 per annum to match the figures for road type.

Source: Government of the Lao People's Democratic Republic, Ministry of Public Works and Transport (2010b), Table 7.

C. Likely Residual Funding to Upgrade and Expand the Road System

8. The available funding for the range of road improvements is determined by calculation of the residual funding available after maintenance and road preservation works budget requirements have been met. It is estimated that the funds remaining for all other road measures will be approximately as in

Table A3.3 below. During 2010–2011 to 2014–2015, KN5.618 trillion ($624.2 million) is estimated to be available for upgrading and expansion.

Table A3.3 Estimated Annual Available Residual Funding for Road System Improvements and Other Expenditure Requirements (KN billion)

Financial Year	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
Total	510.84	661.84	724.84	798.84	882.84	970.84	1,067.84

Source: Derived from Tables A3.1 and A.3.2.

D. Desired Funding to Upgrade and Expand the Road System

9. MPWT (2010) put forward a desired program of road improvements as shown in Table A3.4 for the period 2010–2011 to 2014–2015. The total estimated cost is KN30.096 trillion ($3.34 billion), approximately six times greater than the likely available funding shown in Table A3.3. Clearly, the proposed road improvements are not prioritized.

Table A3.4 Estimated Total Cost of Desired Road Improvements (KN billion)

No.	Description	No. of Projects	Distance (kilometers)	Estimated Cost
1	Special road connection for development	40	2,876.00	4,237.15
2	Road connection for local level economic development	34	2,592.00	7,691.97
3	Road connection for national level economic development	24	1,441.00	17,229.21
4	Road connection for road development policy within			
	72 poor districts	642	8,030.00	682.52
	Special roads	15	300.00	255.00
	Total	**740**	**15,239.00**	**30,095.85**

Source: Government of the Lao People's Democratic Republic, MInistry of Public Works and Transport (2010b), Table 2.

10. A separate investment program prepared by MPWT for the draft national socioeconomic development plan, proposes $3.2 billion of total new transport investments, of which roads represent $2.2 billion, inland waterways $41.0 million, civil aviation $175.0 million, railways $454.0 million, logistics $36.0 million, and urban infrastructure, including water supply, $322.0 million.

E. Government Priorities

11. MPWT's earlier strategic plan for the period to 2015 (MPWT 2009) provides the following statement of priorities, which can be used to prepare a realistic shortlist of road improvement priorities for 2011–2015: (i) first, maintain and preserve the existing road assets; (ii) second, by 2010 achieve road

access to all communities; (iii) progressively eliminate nonmaintainable roads; (iv) upgrade national road links; (v) construct new national road links; and (vi) implement independent project supervision, monitoring, and road safety program.

12. Improvement of basic rural access is a government policy. Nonmaintainable roads represent roads that, for the most part, should serve communities but, through a lack of maintenance funds, have become largely ineffective. The low priority given to national (and international) links is due to the low traffic volumes these roads currently service, indicating that justification for upgrading and new construction will have to continue based on a strict economic justification.

13. The lowest priority given to project supervision and monitoring appears shortsighted because investment quality may be threatened without adequate supervision. Also, the low priority for road safety appears inappropriate given the negative impacts of traffic growth on road crashes and the social and economic associated costs. Finally, the current allocation of priorities makes no allowance for addressing emerging issues, such as urban transport and climate change.

Appendix 4
ADB Assistance to the Transport Sector in the Lao People's Democratic Republic

A. ADB Assistance to the Lao People's Democratic Republic

1. Cumulative public sector lending to the Lao People's Democratic Republic (Lao PDR), from 1995 to 31 December 2006, stood at $1.17 billion, comprising 68 Asian Development Fund loans (including two Greater Mekong Subregion [GMS] loans), 5 ADF grant projects amounting to $32.4 million, and 222 technical assistance (TA) projects totaling $108.8 million. Sectors of Asian Development Bank (ADB) assistance include agriculture and natural resources, education, health, water supply and sanitation, transport and communications, finance, and energy (ADB 2007c). Of the total assistance of $1.17 billion for the period, $198.7 million or 17% was for transport and communications.

2. ADB has been providing assistance to the transport sector in the Lao PDR since 1983, totaling $363 million to 2008 (Table A4.1). These project loans also mobilized considerable additional funds from other donors, increasing the impact of ADB assistance. In addition, ADB provided grant-financed TA to the sector valued at $15.945 million of which 11.1% was for civil aviation and 88.9% was for roads.

B. Significance of ADB Assistance to Transport and Communications

3. Of the government's total expenditure in 2007–2008 and 2008–2009, Table A4.1 shows investment in transport from domestic and external sources represented 9.9% and 9.3% of the total, respectively.[1] For 2007–2008 and 2008–2009,[2] which are the 2 years for which reliable data are available, external funding represented 73.2% and 75.7%, respectively, of the total transport investment of the Ministry of Public Works and Transport (MPWT), which was almost entirely on roads. Of the total external assistance of $121.8 million for 2007–2008, and 2008–2009, ADB contributed $18.9 million or 15.5%.

4. Over 2005–2006 to 2008–2009, external assistance was reasonably stable and averaged $69.0 million per annum. This contrasts with the situation during fiscal years 2000–2001 to 2004–2005, when annual road expenditure is reported to have fluctuated significantly because of heavy reliance on donor funding, which was erratic possibly because of the then-limited number of donors involved in the sector.

[1] Annual public expenditures for roads during fiscal years 2000–2001 to 2004–2005 ranged from 20% to 35% of the national budget, including donor assistance (World Bank 2008c).

[2] The estimated total external assistance for 2009–2010 appears questionable and differs significantly from estimates reported by ADB (2010) as reported in the footnotes to the table.

5. ADB assistance over the same period averaged $12.7 million per annum and exhibited a relative decline as a proportion of total external assistance over the last 2 years of the period. This decline in the ADB contribution was to some extent compensated for by new donors, such as Australia, Viet Nam, and the United Nations, the United Nations Human Settlement Programme, which in 2008–2009 contributed $10.5 million. In 2008–2009, the donor contributions are reported by MPWT (2010) as follows: the Republic of Korea (22.3%); Thailand (20.6%), ADB (18.5%), Organization of the Petroleum Exporting Countries (OPEC) (9.3%), Viet Nam (9.1%), Australia (6.3%), Japan (4.6%), Sweden (4.6%), the World Bank (2.3%), Germany (KfW) 1.6%, Habitat (0.8%), and the People's Republic of China and Norway (both less than 1%).

C. Sector Strategy and Program (1991 to date)

1. Evolving Sector Strategy

6. The ADB country strategy[3] in the Lao PDR evolved from 1991 to 2006 in accordance with national priorities as well as regional demands. The 1991 and 1996 operational strategies adopted sustainable economic growth as a strategic focus. Under these country operational strategies, ADB highlighted essential physical infrastructure, particularly national and provincial roads, river ports, and airport facilities. The 2000 country assistance plan also emphasized economic growth but paid particular attention to providing more balanced development. Emphasizing improvement in public expenditure management, ADB saw a great demand for building capacities in road planning and sustainable operation and maintenance of road networks.

7. The 2001–2005 country strategy and program (CSP) and updates, which emphasized poverty reduction, were more concerned with rural access roads and small airports to promote rural–urban market links. There was also an increasing emphasis on GMS roads to create transport links in line with subregional integration and cooperation within the region.

8. The current 2006–2011 CSP also adopts poverty reduction as a priority. While it seeks to maintain previous lines of assistance, the earlier strategy recommended expanding ADB's support toward the implementation of the GMS program, focusing on the improvement of transport corridors for trade and tourism. The CSP states that ADB will assist the government to manage the road network as a vital development asset—support will be provided to the government to expand access and extend the economic life of the main road network by (i) rehabilitating selected parts of the network, especially along the GMS corridors; (ii) reforming sector regulations and supporting private sector investments along the GMS road corridors; (iii) assisting in securing sustainable maintenance of the road network through the Road Maintenance Fund; (iv) building capacity to strengthen road network management skills; and (v) supporting implementation of rural transport in addition to the rural roads included in the transport portfolio. ADB provided assistance for the rural roads subsector through the agriculture and rural development lending window. These rural roads are typically farm-to-market roads, as well as select district roads connecting district centers. ADB's completed and ongoing assistance has contributed to the construction of about 391 kilometers of such roads in the Lao PDR.

9. ADB had only one project in the civil aviation subsector in the 1990s. In 2002, ADB reentered this subsector through the GMS program by providing a loan for airport infrastructure improvement (extension and rehabilitation of Luang Prabang Airport) aimed at tourism development. Currently, assistance to this subsector forms 7% of the total ADB assistance to the transport sector in the Lao PDR. This is a reflection of ADB priorities presented in the Medium-Term Strategy II where civil aviation is accorded the lowest priority. ADB's current Strategy 2020 continues to focus on other infrastructure areas.

[3] This section is based on Section III of ADB (2010b).

Table A4.1 ADB Loans to the Transport and Communications Sector in the Lao People's Democratic Republic, 1983–2011

Loan No.	Project Name	Fund	Subsector	Amount ($ million)	Date Approved	Date Closed	Project Performance			
							Year	PCR	Year	PPER
1266	Airport Improvement	ADF	Civil Aviation	15.0	18 Nov 93	18 Jan 02	2001	S		
1970	GMS: Mekong Tourism Development	ADF	Industry and Trade	10.9	12 Dec 02	18 Aug 08				
643	Vientiane Plain Road Improvement	ADF	Roads and highways	8.0	11 Oct 83	11 Apr 90	1989	NR	1989	GS
788	Second Road Improvement	ADF	Roads and highways	12.0	16 Sept 86	9 Apr 96	1996	GS		
866	Third Road Improvement	ADF	Roads and highways	19.0	24 Nov 87	7 Mar 95	1995	GS	1997	HS
1009	Fourth Road Improvement	ADF	Roads and highways	39.0	21 Dec 89	4 Jul 97	1998	GS	2001	HS
1108	Fifth Road Improvement	ADF	Roads and highways	34.0	29 Oct 91	14 Jan 98	1998	GS	2001	HS
1234	Sixth Road Improvement	ADF	Roads and highways	26.0	1 Jun 93	22 Jan 03	2003	S		
1369	Champassack Road Improvement	ADF	Roads and highways	48.0	31 Aug 95	26 Jul 01	2001	S	2005	HS
1533	Xieng Khouang Road Improvement	ADF	Roads and highways	46.0	9 Sep 97	28 Apr 06	2006	S		
1727	GMS: East–West Corridor (Regional)	ADF	Roads and highways	32.0	20 Dec 99	22 Feb 08	2008	S	2008	S
1795	Rural Access Roads	ADF	Roads and highways	25.0	7 Dec 00	9 Apr 08	2008	S		
1989	GMS: Northern Economic Corridor	ADF	Roads and highways	30.0	20 Dec 02					
2085	Roads for Rural Development	ADF	Roads and highways	17.7	28 Jun 04					
	Total			**362.6**						

Grant No.	Project Name	Fund	Special Funds ($)	JFPR ($)	Others ($ million)	Source	Total ($)
0082	Northern Greater Mekong Subregion Transport Network Improvement	ADF	54		11.0 14.5 22.4 13.6	OFID Australia Republic of Korea Lao PDR	115.5
	Second Northern GMS Transport Network Improvement	ADF	20		12.0 10.3	OFID Lao PDR	42.3

ADB = Asian Development Bank, ADF = Asian Development Fund, GMS = Greater Mekong Subregion, GS = generally successful, HS = highly successful, JFPR = Japan Fund for Poverty Reduction, OFID = Organization of the Petroleum Exporting Countries Fund for International Development, Lao PDR = Lao People's Democratic Republic, NR = no rating, PCR = project completion report, PPER = project performance evaluation report, s = successful.

Source: Asian Development Bank database.

Table A4.2 Significance of ADB Assistance to Transport in the Lao People's Democratic Republic
($ million, exchange rate $1 = KN9,000)

Fiscal Year	A. Road Funding from National Budget[a]	B. Funding by ADB[b]	C. Funding by Other External Assistance[b]	D. Total External Funding (B + C)	E. % of ADB Funding of Total External Funding (B/D * 100)	F. Total Road Sector Investment by MPWT (A + D)	G. Total Government Expenditure[c]
2005–2006		14.50	54.80	69.30	26.5%		
2006–2007		17.40	68.10	85.50	20.4%		695.80
2007–2008	20.86	6.90	50.00	56.90	12.1%	77.76	785.10
2008–2009	28.81	12.00	52.90	64.90	18.5%	85.71	922.20
2009–2010 (estimate)	40.15	16.80	130.58	147.38	12.9%	187.50	

ADB = Asian Development Bank, MPWT = Ministry of Public Works and Transport.

Note: Estimates for 2009–2010 for D. i.e., total external funding shown in Table 1 of ADB (2010), are for total external assistance to be $48.4 million or 33% of the amount shown.

Sources:

[a] ADB (2010b), Table 1.

[b] Government of the Lao People's Democratic Republic, Ministry of Public Works and Transport (2010), Appendix 7.

[c] World Bank (2008b).

2. Sector Program

10. Of the total of financial assistance of $363 million involving 14 loans provided by ADB from 1983 to 2008 (Table A4.1), only two were not entirely for the roads subsector. These were the Airports Improvement Project in the civil aviation subsector and the GMS Mekong Tourism Development Project in both the civil aviation and the roads and highways subsectors. Out of the 12 loans in the roads and highways subsector, 4 were approved in the 1980s, 5 were approved in the 1990s, and 4 were approved in the 2000s. Of the five loans in the civil aviation subsector, three were approved during the 1990s and the rest were approved after. The assistance for the civil aviation subsector amounted to $17.4 million, while that for the roads and highways subsector amounted to $332.3 million.

11. For TA, five projects were approved for the civil aviation subsector totaling $1.775 million, while the rest were projects for the roads and highways subsector. The 26 TA projects in the roads and highways subsector were mostly during the 1980s and the 1990s. Only one TA, Vientiane Plain Road Improvement, was approved before 1980, and only four TA projects excluding the TA on Management Information System (Phase II) (Supplementary)—Strengthening Social and Environmental Management Capacity in the Department of Roads, Roads for Rural Development, Northern Economic Corridor, and Northern GMS Transport Network Improvement—were approved after 1999.

12. Broadly, ADB's involvement in the road sector responded to the government's priorities, i.e., (i) emphasis on rehabilitation or the primary road network until the late 1990s when, according to Gwilliam (2007), these works represented about half of all public investment; (ii) after 1997, attention was shifted to the preservation of roads, with priority for preserving the national roads rehabilitated during the previous decade; and (iii) formal involvement in upgrading GMS roads after 2006. Rural roads have been addressed from time to time by ADB. Within the roads subsector, rural access was formally addressed in the Rural Roads Access Project approved in 2000 and the Roads for Rural Development Project approved in 2004. However, five agriculture sector projects from 1996 to 2008 also included rural farm-to-market roads. Also, the current Northern Greater Mekong Subregion Transport Network Improvement Project is upgrading National Route 4, and selected connecting rural roads, between Luang Prabang and the Thai border south of Kento. Urban roads have also been addressed as part of other ADB lending with recent projects being the Vientiane Integrated Urban Development Project approved in 1995 and the Vientiane Urban Infrastructure and Services Project approved in 2001. Current proposed projects that are likely to have an urban road component are Sustainable Urban Village Improvements (formerly Small Towns Environmental Improvement); Pakse Urban Environmental Improvement; and GMS Corridor Towns Development, which would involve three towns in the Lao PDR.

13. The Vientiane Sustainable Urban Transport Project (for Board approval in 2012) will be ADB's first integral urban transport operation in the Lao PDR and will support ADB's Sustainable Transport Initiative. The project will facilitate improved public transport in Vientiane as well as greater pedestrian access and mobility in the city center.

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Lao People's Democratic Republic: Transport Sector Assessment, Strategy, and Road Map

The Asian Development Bank (ADB) 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 the Lao People's Democratic Republic (Lao PDR) and ADB, with a focus on roads and urban transport. 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 the Lao PDR in the coming years.

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