# LAO PDR: TRANSPORT SECTOR BRIEF

**East Asia and Pacific Region Transport Sector Unit**
Alberto Nogales - Version: May 1, 2004*

## 1. BRIEF DESCRIPTION OF THE SECTOR

Lao People's Democratic Republic (Lao PDR or Lao) has a population of 5.5 million (2002) that is growing at 2.6% per year. With 236,800 km$^2$ of land area, it does not have access to the sea; has one of the lowest population densities in the region (23 people/km$^2$) (its share of rural population is 65%); and a very low GNI per capita, estimated at US$300 in 2002. Lao is surrounded by roughly 244 million people from five countries: Vietnam (80), Cambodia (12), Thailand (61), Myanmar (48), and China's Yunnan Province (43).

During the last fifteen years Lao has been in the process of transforming its economy from a centrally planned system to one that is market-oriented. In the past ten years, the macroeconomic performance has improved significantly; yet, the situation remains fragile and further efforts are necessary to maintain stability. Despite all the progress achieved, Lao has some of the lowest social indicators in the Southeast Asia region. Agriculture remains the major sector of the economy contributing more than 50% of GDP and employing over 80% of the labor force. Vientiane the main capital city and largest urban concentration with 663,000 inhabitants (2001) has more than 60% of the country's urban population. The three other main cities, are Luang Phrabang, Pakse, and Savannakhet.

In the absence of a railway system and access to the sea, Lao PDR depends primarily on road transport and, to less extent, on river and air transport. The development of an efficient transport system is of paramount importance for regional integration and socio-economic development of the country. Although transport demand is growing, the transport of passengers and goods is constrained by an inadequate transport network that is further limited in coverage by its poor physical condition.

The road network carries 90% of passenger traffic (passenger-km) and 61% of freight traffic (ton-km). The Mekong River and its tributaries carry the substantial remaining share of freight (39%) along with an important 8% of the passenger traffic (doubled the share it had in 1990). Although the volume of airfreight is negligible (0.22%), domestic-passenger air transport has reached 2% of the demand and plays a crucial role in linking urban areas and otherwise inaccessible parts of the country.

**Roads**. Travel by road is the dominant mode of transportation in Lao. The expansion and conservation of the road network are critical to the development of the country. At the end of the 1980s, the road network was in very poor condition and further deteriorated due to lack of funding and appropriate maintenance.

The entire Lao road network in 2002 was roughly 32,600 km. It comprises 7,200 km of national roads (22%), almost 9,000 km of provincial roads (27%), and 16,500 of district and local roads (51%). As of 2002, more than half (53%) of the national network is paved and the rest has gravel or earth surfaces. In 2000 about 61% of the total national roads was classified as in poor or bad condition and only 16% in good condition. Of the provincial roads, 65% of the length is in poor condition, and in some sections passable only in the dry season. About one third (2,600 km) of the 7,200 km of national roads have been rehabilitated or improved to all weather standard through programs financed by the international cooperation.

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* The views expressed in this transport sector brief are those of the author, based on previous work and contributions from the staff of the Transport Unit for the East Asia and Pacific Region (EASTR), and they do not necessarily reflect the views of the World Bank.

During the past decade, the Government has placed high priority, and the largest share of its public investment, to the development of Lao's road network. As a result, more than 3,000 km of roads have been rehabilitated or substantially improved. However, despite the high levels of investment, the road network remains under-developed and in poor condition. Most of the provincial and district road networks consist of tracks that are impassable during the rainy season.

More than half of all public investments in the 1990 - 1995 period were used for rehabilitation and upgrading of roads. However, the road sections that were improved or built during the first half of the last decade deteriorated at a faster rate than expected, due to insufficient and inadequate routine maintenance and overloaded trucks.

Traffic volumes on primary roads are 250-500 vehicles per day, while traffic on rural roads only reach 1/10 of these levels. All passenger transport service providers have been privatized except the Vientiane Municipal Transport (buses). The majority of the freight services have been privatized and the balance is composed of state-owned enterprises, which are autonomous and operating on commercial principles.

Road expenditures are financed from general budgetary allocations, foreign loans, and grants. Road sector revenues are derived from sales and import duties on vehicles, spare parts, tires, and automotive fuel products, as well as annual vehicle license fees, vehicle registration, inspection fees, and drivers license fees. In current Lao Kip terms, annual road sector expenditures for construction, operation, and maintenance have been increasing in recent years. This overall increase was mostly due to increases in expenditures funded from external sources.

To address the low level and uncertainty in maintenance funding, the government established the Road Maintenance Fund (RMF) and Road Fund Advisory Board in April 2001. The RMF provides an enhanced and sustained source for financing the maintenance of the national road network. Incremental revenues have started flowing into the fund in 2002, after the government approved and established the fuel levy and other surcharges in January 2001. It has been agreed with the major funding donors that all funds provided for road maintenance will be channeled through the RMF. The RMF will also benefit from the proceeds of a new levy on gasoline and diesel fuel, a heavy vehicle surcharge, fines and penalties, and any road tolls or international transit charges that maybe introduced in the future. It has been defined that about 90% of the RMF proceeds will go toward maintaining the national roads, and a small percentage (10%) will be assigned to provincial and lesser category roads.

**Inland Waterways**. The Mekong River and its tributaries, the Nam Ou and Se Kong rivers, flow through the country for over 2,000 km. But rapids, falls, and low water levels during the dry season reduce the navigable length for river transportation to only 1,300 km. For navigation purposes, the Mekong in Lao PDR is divided in seven sections along the China, Thailand, and Cambodia borders.

The first two sections (China border – Houeisai – Luang Prabhang) have many small rapids that are a barrier to navigation in the dry season. The section between Luang Prabhang and Vientiane is navigable throughout the year but also has difficult sections, even at high water levels. The most easily navigable section is from Vientiane – Thakhek – Savannakhet, where the navigation could be improved at a relatively low cost, although again, there are several dangerous areas. 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 wet season navigability. In the Pakse – Don Deth section navigation is easier only as far as the Cambodia border where the Khone Falls are an impassable obstacle. A 5-km rail line used to operate in colonial times on Khong Island to transship goods between the top and bottom of the falls.

There are 21 river port facilities on the Lao PDR side of the river. With the exception of one river port (Kaolia) which is operated privately, all facilities are under the responsibility of the provincial DCTPCs.

Vessels up to 400 DWT can operate year round on the northern section of the Mekong River, while elsewhere operations are limited to barges of 200 DWT or less. In the dry season, most of the river is navigable only by small, shallow-draft, narrow-beam passenger vessels.

Vessels of 300 DWT or greater capacity carry mainly industrial and agricultural products. The main commodities handled are 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 China, Lao, Myanmar and Thailand. Since the national road 13S was improved, river freight traffic between Vientiane and Savannakhet has fallen away, whereas there is still thriving river transport on the section between Vientiane and Luang Prabhang because the more severe terrain reduces road transport on that section.

Governance of river infrastructure lies with the Waterways Administration Division (WAD. Its main responsibilities include river gauging, flood hydrology, bank protection, and maintenance of port and navigational aids. River transport is governed by a waterway transport regulation. However, apart from an annual inspection of the fleet, there are no specific safety regulations or requirements, nor do waterway transport regulations conform to any international standard.

**Air Transport**. In the early 1990s the government decided to establish and autonomous authority to manage the Vientiane Wattay International Airport, but it is back under the direct government management of the Lao Airport Authority (LAA). Presently, LAA is responsible for the airports in Vientiane, Luang Prabhang, Pakse, Savannakhet, and Luang Namtha. The remaining minor airports are the responsibility of the provincial governments, although the central government provides annual grants to meet their capital expenditures. The revenues and expenses of LAA are part of the national budget, and its employees are governed by the terms and conditions applicable to government personnel. The Lao government obtains substantial revenue from international over flight charges due to the high traffic volume in the following air routes that pass over Lao PDR airspace: Bangkok – Hong Kong, Bangkok – Manila, Bangkok – Hanoi, and Hanoi – New Delhi.

The airports in Vientiane and Luang Prabhang handle international traffic and provide basic customs, immigration and quarantine services. It is expected that Pakse will become a regional airport in the near future providing similar services. The fourth significant airport is Savannakhet. All four main airports were recently upgraded. There are ten recognized minor airports located in the provincial capitals and thirty-nine other airports with unpaved runways.

Scheduled flights are made in wet season to Xieng Khouang, Oudomxai, Luang Namtha, Houeisai, Xam Nua, Sayaburi, as well as Savannakhet and Pakse. Tahakek and Phongsaly are not serviced by scheduled flights in the wet season due to the constraints of poor conditions of airfields, bad weather, and limited aircraft availability.

International services to Lao are operated by Lao Aviation, Thai Airways International, Viet Nam Airlines, and China (Yunnan) Airlines. Domestic services are operated exclusively by Lao Aviation. There is also a privately owned and operated charter helicopter service, used mainly for aerial work and passenger transport to remote-areas.

**Railways Transport.** Pending the completion of a feasibility study of the Trans-Asian rail link, no firm conclusions on the viability of the various links can be drawn. From preliminary studies, it is clear that the rail route through the Lao parallel to NR13 is the shortest link and would minimize operational costs for Thailand-China traffic. However, the capital cost would be high, much of which would fall on the Lao government. The development of railways in Lao could be considered as an alternative to the road system, particularly in the north-south corridor, and its area of influence, where most of the limited local rail traffic could be generated.

## 2. MAIN ISSUES

Lao PDR must address several key issues to reduce risks and bottlenecks in its transport sector.

**Rural accessibility**. Remote and inaccessible highland parts of Lao PDR are frequently where the poorest, and mainly non-Lao speaking, people live in small scattered villages and communities composed largely by ethnic minorities. In the north, these are also the areas planted with opium, which is a lightweight, high-value crop transportable by foot. Improved accessibility to these communities requires sensitivity to contribute to their economic development goals, while safeguarding their cultural integrity, biodiversity, and conservation of the natural habitat. To achieve sustainable solutions, road design standards and construction practices should be developed that are tailored to each locale. Likewise, appropriate operation and maintenance techniques should be selected.

**Greater attention needs to be paid to rural roads.** Despite the many positive achievements in the national network, Lao continues to lag behind its neighbors in road infrastructure. Road connection between Vientiane and some provincial capitals remains a problem. Roughly half (47%) of the national road network and almost all (96%) provincial roads remain unpaved, and much of it is impassible during the rainy season. More than half of all district centers do not have year-round access by road, and almost one sixth are inaccessible by road at any time. Although continued attention to national roads remains essential, greater attention needs to be paid to rural roads. Without access to the main road and transport system, the benefits derived from regional and national links will be limited, the potential contribution of the rural sector to sustained growth and national development will not be realized, and the poverty of the rural population will not be reduced.

**Funds are inadequate to maintain the investments in infrastructure.** The huge investments in infrastructure of the last decade need to be preserved to continue supporting growth. This is particularly true for roads. The RMF has grown steadily, but slowly, with only one increase in the low initial fuel levy and over-reliance on road tolls. The revenues expected in 2003/04 (US$2.5 million) constitute only 15% of the $16 million estimated annual road preservation needs, and the six-fold increase in fuel levy (to about 3.5 c/liter) needed to reach the full target by 2009 remains a challenge to the government. The country remains heavily dependent on external support in the form of grants or soft loans. The government, with foreign assistance, currently meets an estimated 45% of road maintenance needs, however the difficulty of raising counterpart funds often causes delays.

**The current funding available at the provincial and local levels is insufficient even for minimum routine maintenance interventions.** The majority of available funds are allocated to emergency maintenance works and capital improvements, almost to the exclusion of periodic and routine maintenance. As a result, even roads rehabilitated in recent years have again deteriorated for lack of regular maintenance. Road maintenance relies upon an adequate and predictable funding base, and on developed technical and administrative capabilities within Ministry of Communication, Transport, Post and Construction of Laos (MCTPC) and the Department of Communication, Transport, Post and Construction (DCTPC).

**Decentralization places demand on public administration at the provincial and district levels.** The central government has made considerable progress in reforming transport sector institutions to a structure that permits separation of regulatory oversight from service delivery. But at the provincial and district levels the limitations in skills, training, and the number of capable people are particularly evident, and additional changes are required to provide more transparency and accountability in the award and performance of contracts.

**The local construction and consulting industries need to be further developed.** Lao is comparatively well advanced in facilitating private sector involvement in road construction and maintenance, and in providing transport services. Most road design, construction and maintenance is undertaken by the private sector, and almost all the transport services provided by

the state have been privatized. However, the construction industry, which emerged out of former state-owned enterprises, lacks experience in a commercial, competitive environment, and needs to strengthen its management and technical capabilities. Limited financial capacity and access to credit to purchase equipment are limiting factors that need to be addressed. The engineering consulting industry is small, with only a few capable firms, and it is still dependent on technical support from overseas partners.

**Heavy overloading remains as a key problem.** Currently the improved enforcement of load limits, which is 8.2 tons per axle for trucks compared with 9.1 tons in Thailand and Vietnam, has achieved a significant reduction in the incidence of overloading. However, recent road surveys have revealed that logging trucks and heavy international traffic in some road sections continue to be the main culprits of road deterioration. Moreover, while these overloaded trucks are required to pay a relatively modest surtax for overloading, the total of the taxes collected is much less than the cost to repair the damage to the roads.

**The road accident rates and fatalities are rapidly increasing.** Between 1990 and 2001, it is estimated that while the number of passenger vehicles has doubled and the number of vehicles including motorcycles (and three-wheelers) tripled, the number of road accidents and road fatalities basically quadrupled. In recent years, there have been several improvements in this area, but a more decisive effort is needed, in light of the motorization trend and the wide vehicle mix found in the roads. In 1998, roughly 80% of the total number of vehicles in accidents were motorcycles and three-wheelers.

**There is an unbalanced distribution of the transport demand.** In the absence of adequate railways, and air transport services still subject to government control, the transportation system is overly dependent on a single mode (highways), and Lao does not realize the full potential of inland waterways.

**The absence of a railways transport mode reduces the efficiency of freight traffic.** The Government's strategy to overcome this difficulty is to start with the Thai-Lao rail link between Nongkhai and Vientiane, followed by Thakhek to Tanap (parallel to NR8 to Viet Nam), and a link from Vientiane to Thakhek. This will minimize the route length within Lao PDR, although the Lao - Viet Nam section would pass through mountainous terrain and therefore would be very costly.

**The state-owned national air carrier remains subject to price control and government direction.** Lao Aviation is the sole domestic regular passenger transport carrier and the only Lao carrier operating internationally. Lao Aviation remains government-owned and, while it endeavors to operate on commercial principles, it is still subject to price control and government direction. This is not uncommon for a national air carrier in a small-size domestic aviation market which presently does not have the conditions to attract the competition from a second carrier.

**Lao Aviation is not financially sustainable.** Fares for domestic services are controlled by the Government through the Ministry of Finance and are set at a very low level for Lao passengers on domestic services. Although the government has been progressively increasing the tariff to Lao citizens, the depreciation of the local currency has meant that the revenue in dollar terms from Lao passengers was reduced. Furthermore, with substantially reduced level of subsidies from the government, it is very difficult for the company to run a successful commercial operation.

**The potential for waterways transport along the Mekong River system is not fully realized.** Lao does not fully realize the potential of water transport along the Mekong river and its subsidiaries nor benefit from the reduced impact on the environment or overall lower transport costs for cargo. During the last decade waterway transport doubled its share of the market from 4% in 1990 to 8% in 2002. However, this increase, partly due to the failure of the road system and partly the growth of the economic activities along the Mekong River, is far from the actual potential gains that could be obtained from navigation improvements.

## 3. MAIN POLICY RECOMMENDATIONS

The Government's challenge is to develop a more balanced transport infrastructure system that will contribute to its commitment to reduce poverty and provide transportation facilities for the poorest districts, giving them year-round access to basic services, markets, and new opportunities. The priority focus must be to:

- Improve rural mobility and accessibility to transport services.
- Further develop the road network while continuing to preserve the existing infrastructure.
- Develop an efficient regional transport network to increase its competitiveness.

**Rural mobility and accessibility to transport services should be emphasized.** Although the arterial road network has been substantially rehabilitated and developed, the rural road network is relatively limited and rural accessibility needs urgent attention. The Government's priority is to strengthen the provincial/district/community road network to all weather standards. This will ensure that the benefits from arterial road improvements reach the rural population. Lower transportation costs and better integration of the economy will stimulate production in rural areas and contribute significantly to poverty reduction. This generally involves the construction of local feeder roads; for the more remote and small concentrations of people, access can be improved with upgraded foot tracks that are sufficient for small vehicles or, in some cases, by river transport. Air transport also has a role in delivering services to remote areas where the national or provincial networks are not yet developed to an all-weather standard.

**Further develop the road network while continuing to preserve the existing infrastructure.** Funds are limited to further develop the transport network, but it is important to establish at least one all-weather connection from each provincial center to the core network, based on the north-south axis of NR13, and then to extend links to district centers. Maintaining the transportation system is very costly and could be very challenging for the Government while it continues to expand it. Yet, the resources must be mobilized for Lao to take advantage of new opportunities, as it becomes more market based and integrated with neighboring countries.

**Continue supporting competitive bidding for civil works, promote contractor mobility among provinces, and further develop the local engineering and construction industry.** The construction industry still largely consists of State-Owned Enterprises and is heavily dependent on the Government agencies. It should be gradually transformed and commercialized. These enterprises are under-capitalized, use old and poorly maintained equipment, and have inadequate management, financial and administrative skills. A key element for their development and long-term industry viability is a stable and sufficient flow of local competitive bidding contracts for road construction and maintenance, reliable payment procedures, and access to financial resources to lease or purchase equipment.

**Develop an efficient regional transport network to increase competitiveness.** The development of markets for Lao exports, the cost of imported goods, and foreign exchange earnings from tourism all depend on good regional transport connections. Four elements are essential to increase Lao's competitiveness: develop land access to ports in Thailand or Vietnam, realize the potential of waterways, facilitate international trade with its neighbors, and provide efficient and safe regional and domestic air services.

**Introduce rail as an alternative transport mode.** Developing railways in Lao would be particularly important to improve the efficiency of the overall freight transport network, to reduce the impact of heavy traffic on the main road network, and to provide access to ocean ports either in Thailand or Vietnam. In addition these railway links would provide alternative transport options and strengthen the Lao government's negotiating position for cross-border and transit agreements.

**Fully realize the potential of river transport along the Mekong river and emphasize facility maintenance and rehabilitation.** With the growing demand for waterways freight transport along the Mekong River, selectively develop new facilities and navigation improvements to provide alternative access to villages and district centers, especially during the rainy season. Promote the four-country agreement of Lao with Myanmar, Thailand, and People's Republic of China to facilitate navigation on the upper Mekong to help create economic corridors in the Lao northern region.

**Promote trade and logistics through regional integration initiatives to remove and/or streamline regulations and custom procedures.** The transport sector plays a major role on regional integration, and although links that connect neighboring countries are on top of the priorities in Lao, the dialogue conducive to place adequate regulations and custom procedures should start now. For this purpose, the Ministry of Communications and Transport should work closely with other Ministries (Finance, Foreign Affairs, Customs, Prime Minister Office) to introduce measures to facilitate trade and the movement of goods internally and of those in transit to neighboring countries.

**The focus of civil aviation should be shifted towards the operation and maintenance of the facilities of the major airports, and selectively improve some of the minor airports.** The current traffic demand forecasts, combined with rapid development of the international tourist industry, support the case for gradually expanding and improving the runways at the main domestic airports to operate with larger aircrafts. It also calls for selective improvements in some of the minor airports, which could involve runway extension, taxiways, aprons, terminal building construction, equipment supply, and navigational aids.

**To improve the airline's financial position over time, grant Lao Airlines more autonomy in tariff setting and provide foreign technical and financial support.** A joint-venture arrangement or strategic partner agreement with an overseas operator could enable the airline to adjust and modernize its fleet, and achieve an appropriate balance between acquisition and ownership costs. It should also ensure a high standard of fleet maintenance and create a positive image of Lao Airlines: both are essential for increasing the confidence of the users and for promoting tourism and trade.

**Further separate between regulatory oversight and service delivery in the aviation sector.** Strengthen the provincial governments, equip them to operate and maintain the minor domestic airports, and transfer the level of resources necessary to handle this task. LAA is not fully independent of the Lao Department of Consumer Affairs (DCA). LAA has jurisdiction over the four main airports and Luang Namtha. A more effective system could be for LAA to assume operational management of the minor airports, with ownership retained at the provincial level.

## 4. BANK AND OTHER DONOR ACTIVITIES

Led by the World Bank and the Asian Development Bank (ADB) as the main providers of external financial resources, there is a large and well coordinated international donor community in the transport sector in Lao. The most active are: Australia (AusAID), European Union (EU), German (KfW Development Bank), Japan (JICA), Nordic Development Fund (NDF), Organization of Petroleum Exporting Countries (OPEC), Sweden (Swedish International Development Cooperation Agency/SIDA), and the United Nations Drug Control Program (UNDCP). The international community directly supports the main goal of the Government in the transportation sector which is to fully integrate the economy, thereby providing and enabling environment for trade and commerce and access for all Lao people to basic services.

The theme for ADB in the transport sector in Lao is: "Poverty Reduction through Economic Growth and Improved Access to the Poor". Five operational objectives guide ADB's intervention: efficient transport network for rural development; greater transparency and accountability; viable private sector; efficient regional transport network; and sustainable transport sector.

The mandate of the World Bank's poverty-focused transport interventions include: modernize the local construction industry and promote competitive bidding in the sector; encourage local communities to participate in the processes of planning construction and maintenance of local transport networks; decentralize the resources and responsibility to the provinces and districts; ensure a sustainable, sufficient and stable domestic source of revenue for road maintenance; and continue to work with other agencies and sectors to introduce a multi-sector approach in the projects.

The World Bank's investment lending has been provided primarily for highway improvement projects with a national scope and for provincial development projects which entail a more integrated intervention that includes water and sanitation, together with some employment generation activities financed by other donors.

During the 1987 – 2003 period the World Bank approved US$200 million in investment lending in the transport sector. Four projects have been implemented satisfactorily and two are currently under implementation. There are two projects in the pipeline for a total of US$57 million.

THE WORLD BANK'S TRANSPORT SECTOR PORTFOLIO IN LAO PDR

**Date: As of March - 2003**

| # | PROJECT NAME | SUB-SECTOR | LOAN/CREDIT AMOUNT (2) | STATUS | APPROVAL DATE (3) |
|---|---|---|---|---|---|
| 1 | Southern Transport Project | Highways | 14 | Closed | Mar-91 |
| 2 | First Highway Improvement Project | Highways | 45 | Closed | Mar-91 |
| 3 | Luang Namtha Provincial Development Project | Highways (1) | 10 | Closed | Mar-94 |
| 4 | Second Highway Improvement Project | Highways | 30 | Closed | Apr-94 |
| 5 | Third Highway Improvement Project | Highways | 48 | Closed | Apr-97 |
| | **5 Closed Projects** | **Sub-Total** | **147** | **57%** | |
| 6 | Provincial Infrastructure Project | Highways (1) | 28 | Active | Sep-98 |
| 7 | Road Maintenance Program (Phase 1) | Highways | 25 | Active | Mar-01 |
| | **2 Active Projects** | **Sub-Total** | **53** | **21%** | |
| 8 | Road Maintenance Program (Phase 2) | Highways | 35 | Pipeline | Jun-04 |
| 9 | Provincial and Rural Infrastructure Project | Highways (1) | 22 | Pipeline | Jun-05 |
| | **2 Pipeline Projects** | **Sub-Total** | **57** | **22%** | |
| | | **TOTAL for 9 Projects** | **257** | | |

(1) Includes Provincial Development Projects that have large highways components.
(2) Amounts in million US Dollars
(3) Approval Dates for Pipeline projects are latest estimates.

The objective of the on-going Provincial Infrastructure Project (PRIP) is to strengthen local institutional capacity and rehabilitate and upgrade critical basic infrastructure of its remote northern provinces of Oudomxay and Phongsaly, with an outcome that reduces poverty conditions and improves the standard of living and socio-economic potential of the poor inhabitants of these provinces, and gradually integrates them into the national economy.

The Road Maintenance Project (RMP) promotes the sustainable preservation of the national and local road networks through the development and implementation of financing and management maintenance systems in four selected provinces (Luang Namtha, Luang Prabang, Savannakhet, and Champassack). The eight-year two phase RMP marks a major shift in focus, from investment to one of preservation and sustainable management of the road assets. It aims to help establish a maintenance culture in the country at both national and local levels, providing the tools required for management, and strengthening the capacity for delivering services through the private sector.

## 5. STATUS OF BANK DIALOGUE

The Lao government has performed well on the implementation of Phase 1 of RMP and has requested to proceed with Phase 2. The development objectives of the first phase and all three trigger criteria for the second phase have been substantially met, namely:

(i) The financial resources allocated for road maintenance exceed 35% of needs on the national and local road networks (achieved 45% in FY03);
(ii) The third maintenance annual work program that should have been prioritized using the new Road Management System has been delayed but will be achieved in the next annual program; and
(iii) Disbursements on the on-going RMP credit are greater than 60% (78% in March 2004).

Funding for provincial, district and rural roads is particularly scarce, and an improved mechanism for sharing and distributing funds has been proposed for implementation in the second phase of RMP. The new local road management model developed under the Lao Swedish Road Sector Project is being reviewed before expanding its use to national coverage. The process of clarifying the roles of provincial, district, and village levels in managing rural infrastructure will be coordinated with the proposed Provincial and Rural Infrastructure Project.

Three other issues are being presently discussed as part of the on-going dialog: truck overloading, road safety, and HIV/Aids and transportation.

- **Truck Overloading.** Given the significant need to reduce overloading of heavy vehicles, training will be needed to operate the planned new system of weighing stations.
- **Road Safety.** It is expected that RMP will play a strong role in facilitating the development of road safety awareness and intervention programs. The scale of the road safety problem and the definition of a national road safety strategy will be addressed during project preparation. The potential scope for a safety component under RMP will be discussed with MCTPC in relation to other donor programs.
- **HIV/Aids and Transport.** A prevention strategy, e.g., engaging with long-distance truck drivers, appears appropriate to avoid growth of the HIV/Aids disease to the levels in neighboring countries. The Bank will consult with its Human Development staff, explore with other donors ways to include a component on HIV/Aids, and request grant funding to address this issue.

The development objective of the proposed Provincial Rural Infrastructure Project (PRIP) is to assist the Government of Lao PDR achieve its goal of sustainable economic growth and social development. It will do so by improving access to basic infrastructure services, to income generating activities, and to institutional capacity at the central, provincial and district levels in both the Government and the private sector.

The Bank has confirmed that Houaphan, Xekong, Oudomxay and Phongsaly provinces are suitable for support under PRIP. It is proposed that in Houaphan and Xekong the project would finance infrastructure improvement, institutional strengthening and capacity building at the provincial, district and village levels. It would also support the development of micro-enterprises for roads maintenance and small towns' water supply. In Oudomxay and Phongsaly, the project would provide sustainable water supply and sanitation and promote hygiene awareness in the rural areas and selected small towns.

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Ministry of Transport, Post, Post and Construction - MCTPC

**Interlocutors at the Provincial Level**
Department of Transport, Post, Post and Construction – DCTPC

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# LAO: TRANSPORT SECTOR MEASURES

Version: May 1, 2004

| | Basic Statistics | Unit | 1980 | 1985 | 1990 | 1995 | 2000 | 2001 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total population | million people | | | | | 5.218 | 5.377 | | NSC |
| [2] | Urban population | million people | | | | | | 1.059 | 2001 | UNPD |
| [2] | Rural population | million people | | | | | | 4.318 | 2001 | UNPD |
| | Number of households | thousand households | | | | | 865.535 | 881.596 | 2001 | NSC |
| | GDP | million US$ | | | 865 | | 1,711 | 1,761 | 2001 | WB |

| Geographical & Land Characteristics | | | Terrain Type | | | | 2002 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|
| Terrain Type Distribution | | | Mountains (&hills) | Plateaus | Basins | Plains | | | |
| Percentage of Terrain Type | % of land area | | | | | | 0% | | |
| | | | Climate Zone | | | | 2002 | | |
| Climatic Zones Distribution | | | Humid Zone | Semi-Humid | Semi-Arid | Arid | | | |
| Percentage of Climatic Zones | % of land area | | | | | | 0% | | |
| Area of Territory | thousand $km^2$ | | | | | | 236.8 | | WB |
| Number of Islands | number | | | | | | 0 | | |
| Area of Islands | km2 | | | | | | 0 | | |
| Length of Coastline | km | | | | | | 0 | | |
| Length of Mainland Shore | km | | | | | | 0 | | |
| Length of Island Shore | km | | | | | | 0 | | |
| Length of Boundaries | km | | | | | | 5,083 | | CIA |

| Road Network - Functional Classification (Administrative) | | Roads & Highways | | | | | Total Roads & Highways | Year | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | National or Interstate | Provincial or Regional | County or District | Village and Town or Local | Other or Special Purpose | | | |
| Road Network Length | km | 7,160 | 8,950 | 6,620 | 9,890 | | 32,620 | 2002 | MCTPC |
| Road Network Length | km | 7,021 | 7,691 | 9,210 | | | 23,922 | 2000 | MCTPC |
| Road Network Length | km | | | | | | 0 | | |
| Road Network Length | km | | | | | | 0 | | |
| Road Network by Surface Type and Condition | km | 7,160 | 8,950 | 16,510 | | | 32,620 | 2002 | MCTPC |
| Length of Paved Roads | km | 3,830 | 337 | 423 | | | 4,590 | 2002 | MCTPC |
| Length of Gravel Roads | km | 2,118 | 3,947 | 3,595 | | | 9,660 | 2002 | MCTPC |
| Length of Earth Roads | km | 1,212 | 4,666 | 12,492 | | | 18,370 | 2002 | MCTPC |
| Length of Paved Roads | km | 3,591 | 672 | 394 | | | 4,657 | 2000 | MCTPC |
| Length of Gravel Roads | km | 1,935 | 2,325 | 1,816 | | | 6,076 | 2000 | MCTPC |
| Length of Earth Roads | km | 1,495 | 4,694 | 7,000 | | | 13,189 | 2000 | MCTPC |
| Length in Good Condition | km | 1,106 | 1,444 | 1,507 | | | 4,057 | 2000 | MCTPC |
| Length in Regular (Fair) Condition | km | 1,609 | 1,247 | 2,619 | | | 5,475 | 2000 | MCTPC |
| Length in Poor Condition | km | 4,306 | 5,000 | 5,084 | | | 14,390 | 2000 | MCTPC |

| Length of Transport Routes | | 1980 | 1985 | 1990 | 1995 | 2000 | 2002 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|
| **Total length of transport network** | km | | | | | | 34,440 | | MCTPC |
| Railway Length in Operation | km | | | | | | 0 | | MCTPC |
| National Electrified Railways | km | | | | | | 0 | | MCTPC |
| National Length of Railways in Operation | km | | | | | | 0 | | MCTPC |
| National Double-Tracking Length | km | | | | | | 0 | | MCTPC |
| Highways | km | | | | | | 32,620 | | MCTPC |
| Expressway | km | | | | | | 0 | | MCTPC |
| Navigable Inland Waterways | km | | | | | | 1,820 | | MCTPC |

| | Airports | | | | | | 1999 | 2001 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Airports | number | | | | | 51 | 51 | | CIA |
| | Airports with unpaved runways | number | | | | | 39 | 39 | | CIA |
| | Airports with paved runways | number | | | | | 12 | 12 | | CIA |
| | Airports with paved runway length >1,524 m | number | | | | | 6 | 6 | | CIA |
| [3] | Number of Major International Airports | number | | | | | 1 | | 2001 | |
| [3] | Aircraft Movements | number | | | | | 11,278 | | 1999 | LAA |
| [3] | Commercial Passengers | number | | | | | 433,546 | | 1999 | LAA |
| [3] | International Passengers | number | | | | | 159,680 | | 1999 | LAA |
| [3] | Domestic Passengers | number | | | | | 273,866 | | 1999 | LAA |
| [3] | Cargo (Freight and Mail) | Metric Tons | | | | | 1,494 | | 1999 | LAA |
| [3] | International Freight | Metric Tons | | | | | 551 | | 1999 | LAA |
| [3] | Domestic Freight | Metric Tons | | | | | 806 | | 1999 | LAA |

| Ports | | | | | | | 2002 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|
| Number of Major Coastal Ports | number | | | | | | 0 | | |
| Number of Berths in Major Coastal Ports | number | | | | | | 0 | | |
| Volume of Freight Handled in Major Coastal Ports | Thousand Tons | | | | | | 0 | | |
| Number of Major River Ports | number | | | | | | 21 | | WAD |
| Number of Berths in Major River Ports | number | | | | | | | | |

| Vehicle Fleet | | Motor Vehicles | | | | | Total Vehicles | Year | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | Passenger | | Buses | | Trucks | | | |
| Large / Heavy | thousand | Jeeps | 3.173 | Large Buses | 1.720 | | | 1998 | MCTPC |
| Medium / Middle | thousand | Pickups | 12.707 | Buses | 1.405 | | | 1998 | MCTPC |
| Small / Light | thousand | Cars | 8.290 | | | | | 1998 | MCTPC |
| Minicar / Mini | thousand | | | | | | | 1998 | MCTPC |
| Total | thousand | Sub-Total | 24.170 | Sub-Total | 3.125 | 8.861 | 36.156 | 1998 | MCTPC |

| | Vehicle Fleet Per Year | | 1980 | 1985 | 1990 | 1995 | 1998 | 2002 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| | Passenger | thousand | | 13.453 | 14.901 | 22.181 | 27.295 | | | MCTPC |
| | Trucks | thousand | | 4.795 | 6.236 | 7.714 | 8.861 | | | MCTPC |
| | Other | thousand | | | | | | | | |
| | Total | thousand | | 18.248 | 21.137 | 29.895 | 36.156 | | | MCTPC |
| [1] | Motorcycles | thousand | | 41.533 | 58.775 | 108.712 | 145.913 | | | MCTPC |
| | Total (including motorcycles) | thousand | | 59.781 | 79.912 | 138.607 | 182.069 | | | MCTPC |

| | Road Accidents Statistics | | 1980 | 1985 | 1990 | 1995 | 2000 | 2001 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Accidents | number | | | 1,090 | 2,291 | 4,335 | 4,681 | | MCTPC |
| [4] | Number of Fatalities | number | | 80 | 99 | 298 | 358 | 372 | | MCTPC |
| | Number of Injuries | number | | | 1,250 | 5,050 | 4,555 | 7,673 | | MCTPC |

| | Road User Charges | | | | | 1998 | 1999 | 2000 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total road user charges | US$ million | | | | 16.5 | 11.2 | 11.8 | | MCTPC |
| [5] | Road user charges (Public) | US$ million | | | | 6.5 | 0.2 | 0.2 | | MCTPC |
| [6] | Road user charges (Private) | US$ million | | | | 10.0 | 11.0 | 11.6 | | MCTPC |

| Public Expenditure | | Transport Mode | | | | | Total Expenditure | Year | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | Railways | Highways | Waterways | Aviation | Other | | | |
| Total Annual Public Expenditure | US$ million | | 47.4 | | | | | 2000 | MCTPC |
| Capital Investment (New Const.,Expans.&Reconst.) | US$ million | | 45.0 | | | | | 2000 | MCTPC |
| Maintenance and Preservation | US$ million | | 2.4 | | | | | 2000 | MCTPC |

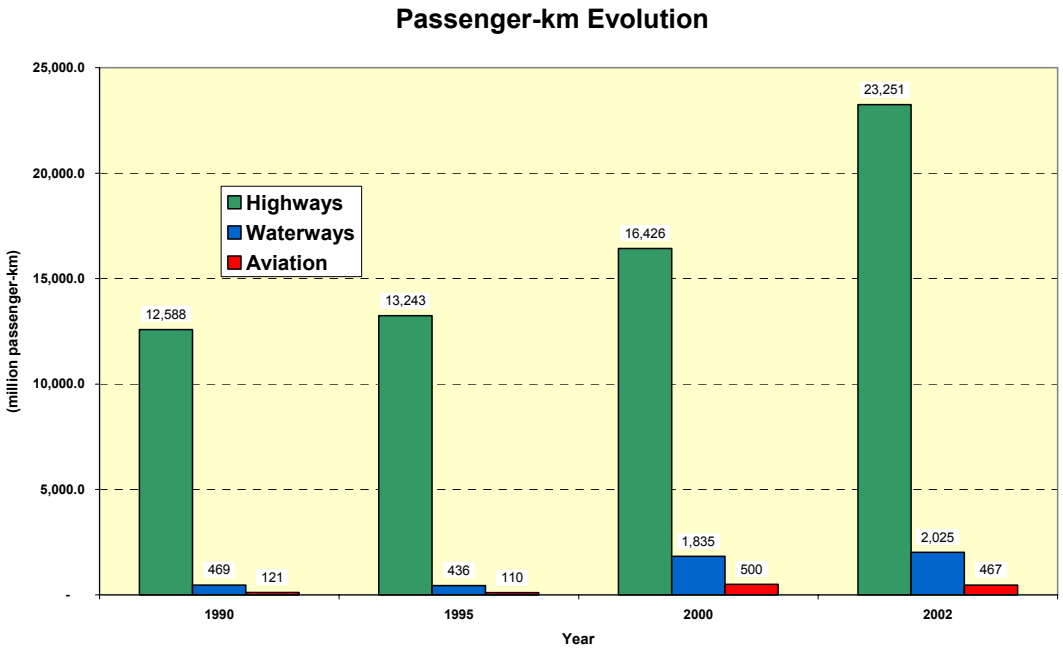
| | Public Expenditure Evolution | | 1980 | 1985 | 1990 | 1995 | 2000 | 2002 | Year | Source |
|---|---|---|---|---|---|---|---|---|---|---|
| [8] | Exchange Rate with US$ | | | 45 | 709 | 805 | 7,888 | 7,622 | | WB |
| [7] | Total Annual Capital Public Expenditure | US$ million | | | | | 120 | 99 | | MCTPC |
| | Railways | US$ million | | | | | | | | |
| | Highways | US$ million | | | | | | | | |
| | Waterways | US$ million | | | | | | | | |
| | Civil Aviation | US$ million | | | | | | | | |
| | Other | US$ million | | | | | | | | |

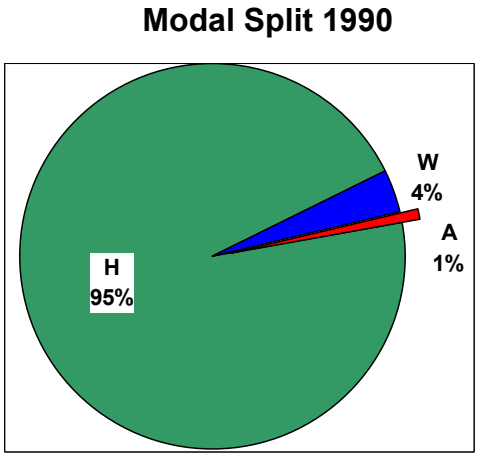
**Notes:**

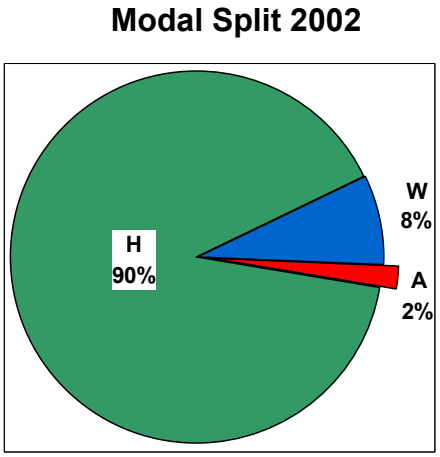
[1] The data on motorcycles includes three wheelers (tuk-tuk). Threw wheelers 4,235 (98); 3,833 (95); 897 (90); and 832 (85).
[2] Rural and Urban Population estimated based on the UNPD data of 19.7% urban for 2001.
[3] Based only in the International Airport in Vientiane
[4] It is estimated that since 1975 more than 4,000 deaths due to road accidents.
[5] Under "public road user charges" the data on "Fuel Contribution" has been registered.
[6] Under "private road user charges' the data on "Vehicle Contribution" has been registered.
[7] As a reference the total public investment in "Communications" is registered.
[8] The average annual exchange rate provided was used to calculate the Capital Expenditure amount in US$ dollars.

**Sources:**

NSC - National Statistical Center - Lao PDR
MCTPC - Ministry of Construction, Transport, Post and Communications
WB - World Bank - SIMA
LAA - Lao Airport Authority
CIA - Central Intelligence Agency - The World Fact Book
UNPD - United Nations Population Division
WAD - Water Administration Division - MCTPC



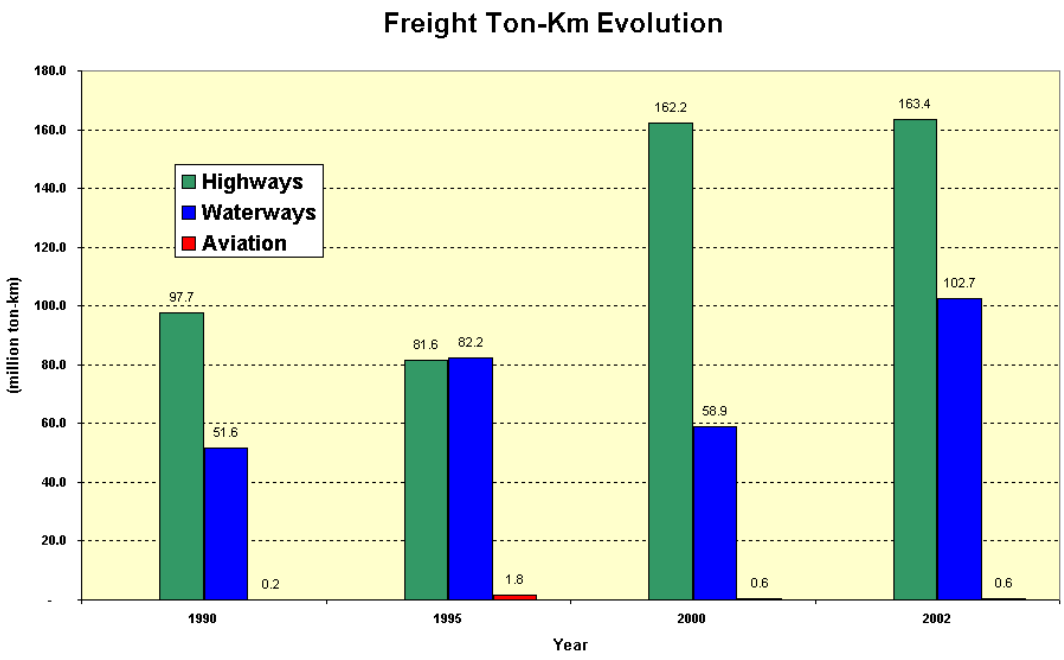



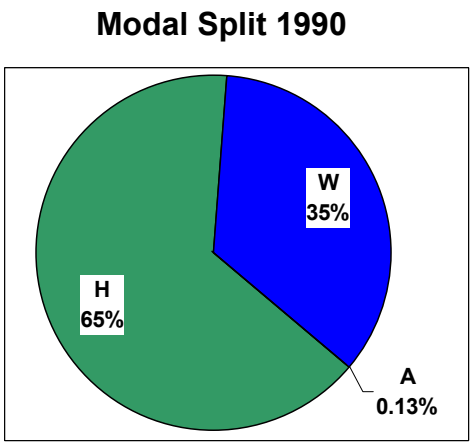



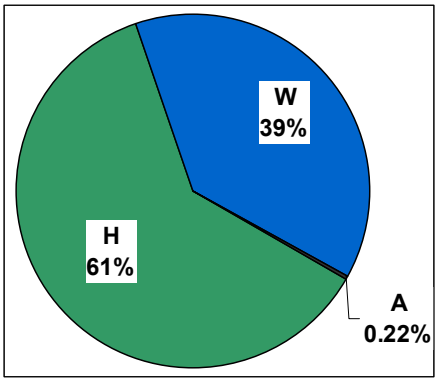

**H: H**IGHWAYS **R: R**AILWAYS **W:W**ATERWAYS **A:A**VIATION

Given the reduced population and low levels of traffic, the aggregate passenger transport demand of about 26 billion passenger-km (2002) is the lowest in the region. Passenger transportation depends primarily on road transport which is, and will remain, the dominant mode given its accessibility and flexibility in developing the network. However, between 1990 and 2002 the highways share of the market has dropped from 95% to 90% in favor of river and air transport. Inland waterways have gained an important 8% of the passenger traffic, which is doubled the share it had in 1990 (4%). The aviation sector, which plays a crucial role in linking urban areas and otherwise inaccessible parts of the country, has increased and reached 2% of the demand.

Source: Lao PDR – National Statistical Center – Statistical Yearbook 2002.




**H: H**IGHWAYS **R: R**AILWAYS **W:W**ATERWAYS **A:A**VIATION

Although freight transport demand is growing, the transport of goods is constrained by an inadequate transport network, and limited in coverage by its physical condition. In the absence of railways, which reduces the efficiency of freight traffic and generates an unbalanced distribution of the transport demand, freight transportation is heavily dependent on highways and waterways. The road network carries 61% of freight traffic (ton-km), while the Mekong river and its tributaries carry the remaining and substantial share of freight (39%). The volume of airfreight is negligible and its share of the market is less than 1% (0.22%). Despite the government's greater emphasis on highway investments and the fact that Lao does not realize the full potential of inland waterways, during the 1990 – 2002 period, highways lost 4% of the market to waterways.

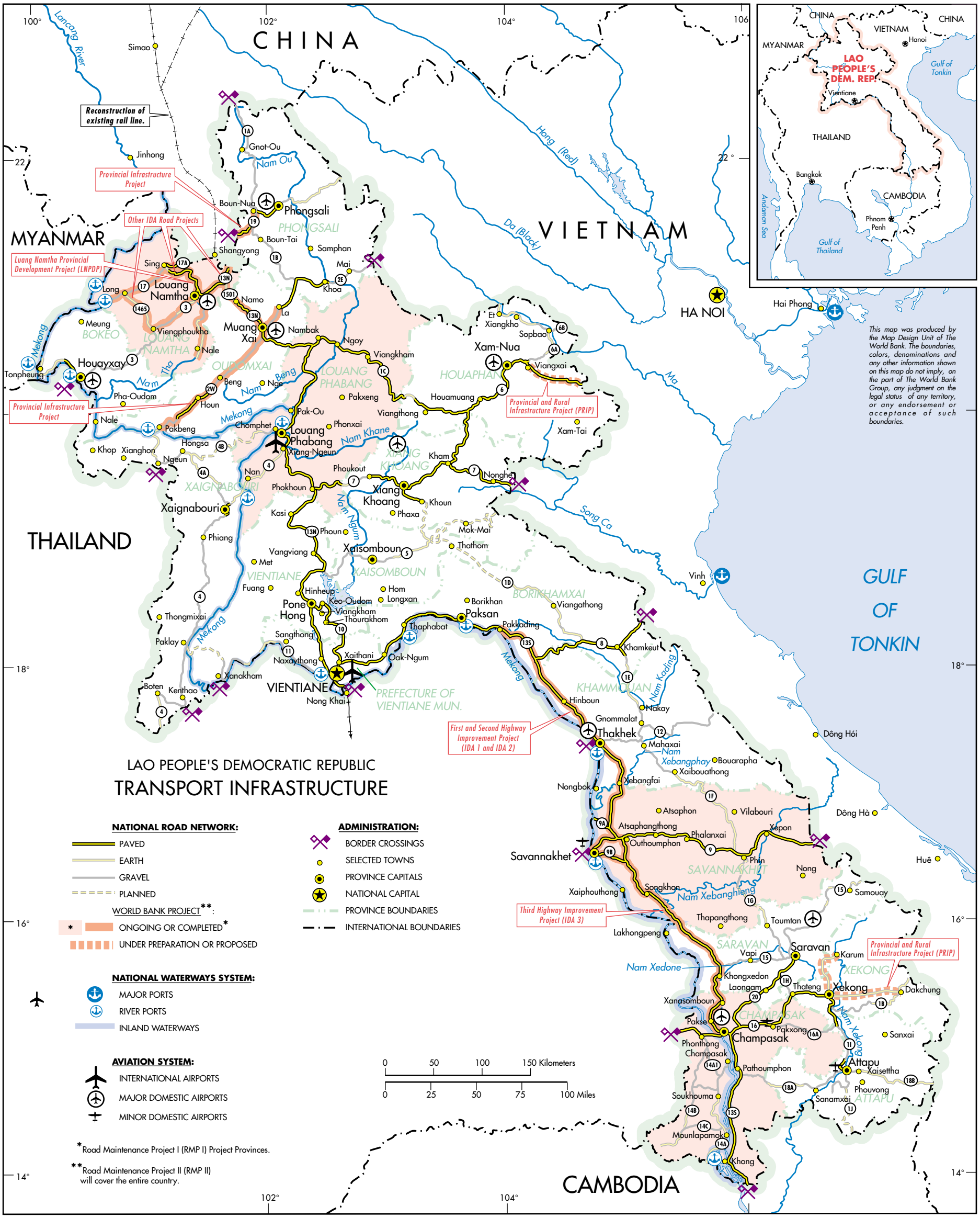
Source: Lao PDR – National Statistical Center – Statistical Yearbook 2002.

# LAO: TRANSPORT SECTOR INDICATORS

Version: May 1, 2004

| | | | | | |
|---|---|---|---|---|---|
| | **Country Name** | | Lao PDR | Lao PDR | Lao PDR | Lao PDR |
| | **Year** | | 1980 | 1990 | 2000 | 2002 |
| | **Population** | | 1980 | 1990 | 2000 | 2002 |
| | Percentage Urban Population | % | | | | 20% |
| | Percentage Rural Population | % | | | | 80% |
| | **Average Household Size** | person | | | | 6.10 |
| | Average Urban Household Size | person | | | | |
| | Average Rural Household Size | person | | | | |
| | Population Density | people per km2 | | | | 22.71 |
| | **Period** | | 1970-1990 | 1990-2002 | | 2002 |
| [1] | **Population Growth (average per year)** | % | 2.1% | 2.4% | | 2.6% |
| | Average Annual Urban Population Growth | % | 4.5% | 4.7% | | |
| | Average Annual Rural Population Growth | % | | | | |
| | **Basic Statistics** | | 1980 | 1990 | 2000 | 2002 |
| | Annual GDP Growth | | | 4.5% | 5.8% | 5.7% |
| | GNI per Capita | US$ | | 210 | 290 | 300 |
| | Country Classification - Income Group Level | | | Low Income | Low Income | Low Income |
| | **Period** | | | 1990-2002 | | |
| | Average Annual GDP Growth | % | | 3.8% | | |
| | **MARKET CONTEXT** | | Lao PDR | Lao PDR | Lao PDR | Lao PDR |
| | | | 1990 | 1995 | 2000 | 2002 |
| | **Modal Split Passenger Traffic [passenger-km]** | | | | | |
| | Highways market share | % | 95.5% | 96.0% | 87.6% | 90.3% |
| | Railways market share | % | 0.0% | 0.0% | 0.0% | 0.0% |
| | Waterways market share | % | 3.6% | 3.2% | 9.8% | 7.9% |
| | Aviation market share | % | 0.9% | 0.8% | 2.7% | 1.8% |
| | **Modal Split Freight Traffic [ton-km]** | | | | | |
| | Highways market share | % | 65.4% | 49.3% | 73.2% | 61.3% |
| | Railways market share | % | 0.0% | 0.0% | 0.0% | 0.0% |
| | Waterways market share | % | 34.5% | 49.6% | 26.6% | 38.5% |
| | Aviation market share | % | 0.13% | 1.09% | 0.27% | 0.22% |
| | **ACCESS** | | Lao PDR | Lao PDR | Lao PDR | Lao PDR |
| | | | 1990 | 1995 | 2000 | 2002 |
| | **Transport network includes (roads & highways, railways and waterways)** | | | | | |
| | Transport network density in terms of land area | km/ 1,000 km2 | | | | 145.44 |
| | Transport network density in terms of total population | km/ 1,000 people | | | | 6.41 |
| | **Road Density** | | | | | |
| | Road density in terms of land area | km/ 1,000 km2 | | | | 138 |
| | Road density in terms of total population | km/ 1,000 people | | | | 6.07 |
| | **Rail Density** | | | | | |
| | Rail density in terms of land area | km/ 1,000 km2 | | | | 0.00 |
| | Rail density in terms of total population | km/ 1,000 people | | | | 0.00 |
| | **Waterways Density** | | | | | |
| | Waterways density in terms of land area | km/ 1,000 km2 | | | | 7.69 |
| | Waterways density in terms of total population | km/ 1,000 people | | | | 0.34 |
| | **Airports and Ports** | | | | | |
| | Number of Airport with runway length >1,524 m per land area | number/ 100,000 km2 | | | | 2.53 |
| | Number of Major Coastal Ports per length of Coastline | number/ 1,000 km coastline | | | | 0.00 |
| | Number of River Ports per length of navigable inland waterways | number/ 1,000 km IWW | | | | 11.54 |
| | **Motorization and NMT** | | | | | |
| [2] | Number of motor vehicles per household | vehicles/100 households | | | 4.2 | |
| [2] | Number of motor vehicles per thousand people | vehicles/1,000 people | | | 6.9 | |
| [2] | Number of motorcycles per household | motorcycles/100 households | | | 16.9 | |
| [2] | Number of bicycles per household | | | | | |
| | **AFFORDABILITY** | | Lao PDR | Lao PDR | Lao PDR | Lao PDR |
| | | | 1995 | 1998 | 2000 | 2002 |
| | **Fuel Price** | | | | | |
| | Gasoline (Super/Regular) | US$ cent per liter | | 31 | 33/29 | |
| | Diesel Oil | US$ cent per liter | | 24 | 25 | |
| | **Transport Freight Cost** | | | | | |
| | Average [or range] trucking cost per ton-km | U$ cent per ton-km | | | | |
| | Average [or range] train cost per ton-km | U$ cent per ton-km | | | | |
| | Average [or range] waterways cost per ton-km | U$ cent per ton-km | | | | |
| | Average [or range] air cost per ton-km | U$ cent per ton-km | | | | |
| | **Transport Passenger Cost** | | | | | |
| [4] | Average [or range] bus cost per passenger-km | U$ cent per pass-km | | | | |
| | Average [or range] train cost per passenger-km | U$ cent per pass-km | | | | |
| | Average [or range] air cost per passenger-km | U$ cent per pass-km | | | | |
| | **QUALITY** | | Lao PDR | Lao PDR | Lao PDR | Lao PDR |
| | | | 1990 | 1995 | 2000 | 2002 |
| | **National Road Network Condition** | | | | | |
| | % of roads in good condition of national network | % | | | 16% | |
| | % of roads in fair (regular) condition of national network | % | | | 23% | |
| | % of roads in poor condition of national network | % | | | 61% | |
| | **National Road Network Quality** | | | | | |
| | Paved Roads as proportion of national road network | % | | | | 53% |
| | Expressways/Motorways as proportion of national road network | % | | | | 0% |
| | **National Railway Network Quality** | | | | | |
| | Double-tracking rails as proportion of national rail network | % | | | | 0.00% |
| | Electrified rails as proportion of national rail network | % | | | | 0.00% |
| | **Air Transport** | | | | | |
| [3] | Average number of movements per international airport per day | number | | | 31 | |
| [3] | Average number of passengers per international airport per day | number | | | 1,188 | |
| [3] | Average volume of cargo per international airport per day | metric tons | | | 4 | |
| | **Ports** | | | | | |
| | Average number of berths per major river port | number | | | | 0 |
| | Average number of berths per major coastal port | number | | | 93.00 | 0 |
| | Average freight volume handled per major coastal ports per day | tons | | | 18.60 | 0 |
| | **Road Safety** | | | | | |
| | Number of accidents in terms of motor vehicles | accidents/10,000 veh | 516 | 766 | 1,199 | |
| | Number of fatalities in terms of motor vehicles | fatalities/10,000 veh | 47 | 100 | 99 | |
| | Number of injuries in terms of motor vehicles | injuries/10,000 veh | 591 | 1,689 | 1,260 | |
| | Number of accidents in terms of population | accidents/100,000 people | | | 83 | 87 |
| | Number of fatalities in terms of population | fatalities/100,000 people | | | 7 | 7 |
| | Number of injuries in terms of population | injuries/100,000 people | | | 87 | 143 |
| | **FISCAL COST** | | Lao PDR | Lao PDR | Lao PDR | Lao PDR |
| | | | 1980 | 1990 | 2000 | 2002 |
| | **Expenditure on transport as share of GDP** | | | | | |
| | Expenditure on transport capital investment as share of GDP | % | | | 7.02% | 5.62% |
| | Expenditure on transport maintenance as share of GDP | % | | | | |
| | Expenditure on highways as share of GDP | % | | | | |
| | Expenditure on railways as share of GDP | % | | | | |
| | Expenditure on waterways as share of GDP | % | | | | |
| | Expenditure on aviation as share of GDP | % | | | | |
| | Ratio road user charges & capital expenditure highways | % | | | | |

[1] Population growth for 2002 estimate from CIA.
[2] Indicators on motorization for 2000 use number of vehicles from the latest data which is 1998.
[3] Estimated using the 1999 data on Air Traffic Statistics of Vientiane
[4] It refers to intercity travel costs.


CHINA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
GULF OF TONKIN
HA NOI
Hai Phong
Reconstruction of existing rail line.
Provincial Infrastructure Project
Other IDA Road Projects
Luang Namtha Provincial Development Project (LNPDP)
Provincial Infrastructure Project
Provincial and Rural Infrastructure Project (PRIP)
First and Second Highway Improvement Project (IDA 1 and IDA 2)
Third Highway Improvement Project (IDA 3)
Provincial and Rural Infrastructure Project (PRIP)
PREFECTURE OF VIENTIANE MUN.
Simao
Jinhong
Gnot-Ou
Nam Ou
Boun-Nua
Phongsali
PHONGSALI
Boun-Tai
Samphan
Mai
Khoa
Shangyong
Sing
Long
Louang Namtha
LOUANG NAMTHA
Namo
La
Muang Xai
Nambak
Meung
BOKEO
Viengphoukha
Nale
Houayxay
Tonpheung
Nam Tha
OUDOMXAI
Beng
Nam Beng
Ngoy
Viangkham
LOUANG PHABANG
Et
Xiangkho
Sopbao
Xam-Nua
Viangxai
HOUAPHAN
Pha-Oudom
Houn
Pakxeng
Houamuang
Viangthong
Pak-Ou
Chomphet
Louang Phabang
Phonxai
Nam Khane
Xiang-Ngeun
Xam-Tai
Pakbeng
Khop
Xianghon
Hongsa
Ngeun
Nan
XIANG KHOANG
Kham
Nonghet
Phoukout
Phokhoun
Xiang Khoang
Khoun
Phaxa
XAIGNABOURI
Xaignabouri
Kasi
Phiang
Phoun
Nam Ngum
Mok-Mai
Thathom
Vangviang
Xaisomboun
XAISOMBOUN
Met
VIENTIANE
Fuang
Hinheup
Hom
Longxan
Pone Hong
Keo-Oudom
Viangkham
Thourakhom
Borikhan
BORIKHAMXAI
Viangathong
Paksan
Thaphabat
Pakkading
Thongmixai
Paklay
Sangthong
Naxaythong
Xaithani
Oak-Ngum
Khamkeut
Nam Kading
Xanakham
Boten
Kenthao
VIENTIANE
Nong Khai
KHAMMOUAN
Hinboun
Nakay
Gnommalat
Thakhek
Mahaxai
Nam Xebangphay
Bouarapha
Xaibouathong
Xebangfai
Nongbok
Atsaphon
Vilabouri
Atsaphangthong
Phalanxai
Xepon
Outhoumphon
Savannakhet
SAVANNAKHET
Phin
Nong
Xaiphouthong
Songkhon
Nam Xebanghieng
Samouay
Thapangthong
Toumtan
Lakhongpeng
SARAVAN
Saravan
Vapi
Karum
Nam Xedone
Khongxedon
Laongam
Thateng
Xekong
XEKONG
Dakchung
Xanasomboun
Pakse
CHAMPASAK
Pakxong
Champasak
Phonthong Champasak
Pathoumphon
Nam Xekong
Sanxai
Attapu
Xaisettha
Phouvong
ATTAPU
Sanamxai
Soukhouma
Mounlapamok
Khong
Vinh
Dông Hói
Dông Hà
Huê
Lancang River
Mekong
Hong (Red)
Da (Black)
Ma
Song Ca
Gulf of Tonkin
Andaman Sea
Gulf of Thailand
Hanoi
Vientiane
Bangkok
Phnom Penh
LAO PEOPLE'S DEM. REP.
LAO PEOPLE'S DEMOCRATIC REPUBLIC
TRANSPORT INFRASTRUCTURE
NATIONAL ROAD NETWORK:
PAVED
EARTH
GRAVEL
PLANNED
WORLD BANK PROJECT**:
* ONGOING OR COMPLETED*
UNDER PREPARATION OR PROPOSED
ADMINISTRATION:
BORDER CROSSINGS
SELECTED TOWNS
PROVINCE CAPITALS
NATIONAL CAPITAL
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
NATIONAL WATERWAYS SYSTEM:
MAJOR PORTS
RIVER PORTS
INLAND WATERWAYS
AVIATION SYSTEM:
INTERNATIONAL AIRPORTS
MAJOR DOMESTIC AIRPORTS
MINOR DOMESTIC AIRPORTS
0 50 100 150 Kilometers
0 25 50 75 100 Miles
*Road Maintenance Project I (RMP I) Project Provinces.
**Road Maintenance Project II (RMP II) will cover the entire country.
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