

## CHAPTER VI

### CONCLUSION

This chapter summarizes the major findings from the previous discussion, and suggests further research from some topics that are only partially covered.

The main theme of this thesis was:

- (i) to examine the development of an integrated land transport network and to measure the extent of the urban structural changes that have taken place, the analysis of both physical and economical changes, such as: the improved transport network, the formation of the new cities, the expansion of existing cities including the population agglomeration at such hubs emerging along the transport route and its effects will be analyzed in depth to respond to the following questions *Has urban growth taken place during the last three decades? Where and in which patterns and densities have new urban developments taken place? How has the population agglomeration at such has emerged?*
- (ii) to examine the correlation between an integrated land transport network and urban development *in the case of land-linked country* by conducting a detailed analysis of the urban development in each province during the last three decades. The Case study of the two main provinces, namely Vientiane and Savannakhet, was to answer the question, *why some areas within the study have seen faster growth than others.* The outcome of the study will provide an explanation of the reasons why some areas within the study have seen faster growth and others have not. The study also describes the driving forces that shape urban growth, including the government interventions which influenced the formation of the cities.

To examine the development of an integrated land transport network and to measure the extent of the urban structural changes that have taken place, methods used in this research were the utilization of the spatial statistical analysis function of GIS software: 'MapInfo' and 'ARC View' to interpret the land use data obtained in identifying the location of expanded urban areas, including the patterns and density of new urban growth,

The time-series analysis with the associated indicator called "the integrated land transport development phases" has been created to understand the evolution of the transport network itself and to analyze the correlation between integrated land transport network and urban development. The integrated land transport development phases express the degree of integration of Lao PDR to the international community which depends on the improved cross border facilities, the improved land-linked transport network. Based on the above variables in each period, the integration level of Lao PDR development can be logically phased into four distinctive stages with specific features attributable.

In order to analyze the impact of the integrated land transport network on the population agglomeration and urban development in each time frame it is necessary to link the integrated land transport network phases to the changing in the population agglomeration and urban development. The phenomenon of the growth and declination of the population agglomeration and urban development in Lao PDR both at provincial and district level due to the improvement of the integrated land transport network in each time frame will be analyzed by calculating a value of mean, variance and closely-related standard deviation of the population agglomeration. The standard deviation is the most common measure of statistical dispersion, measuring how widely spread the values in a data set is. By comparing standard deviation of population agglomeration in each time frame the change in the population distribution, the increased/decreased annual population growth rate and the annual population growth rate distribution could be examined. This aspect also includes the analysis of the shift of the size rank of each province in each phase describing the shifting of the importance of its role within the country. The analysis is discussed intensively on population agglomeration and urban development in Vientiane Capital and Savannakhet Province as a case study which somehow reflect the pictures of other provinces which share similar characteristics. In addition the analysis of the population agglomeration level, percentage population agglomeration share of each district in its province of each time frame will be calculated and compared, to identify the tendency of both increased/decreased population agglomeration. The impact of integrated land transport network on population agglomeration is also verified by correlating the dispersion of the annual population growth rate with the increased traffic volume, degree of integration, the improved transport network over time and the increased freight and passenger transport.

# 1. The Impact of Greater Mekong Sub-region Integrated Land Transport Network

## 1.1 Land Integrated Transport Development Phases: Transportation Accessibility, Interconnectivity, Capacity, Efficiently, Reliability and Level of Service

Regardless of political and cultural barriers, the Lao People's Democratic Republic adopted accessibility and interconnectivities to neighboring countries which largely depend on the land transport network, due to the land-locked country status. However, the Mekong River water way transportation has also played an important role with neighboring countries which have shared the same benefits for several decades. Therefore, the land linked integrated transport network is considered as the major variable which determined the increased accessibility and interconnectivity of the country as well as the surrounding GMS countries.

Having examined the Lao PDR government policy and the improved integrated land transport network in the past three decades, the country's accessibility and interconnectivities to neighboring countries could be divided into four distinctive stages with specific features attributable to these stages.

**Primary Phase:** After the change in government and policy system at the end of 1975, with a centrally planned economic system<sup>1</sup> Lao PDR closed its entire border. An action which was related to political policy and security. As a consequence, the country's economic and trade relations were limited with neighboring countries. As the border is totally closed, this results in a non-integration level with other countries. In this phase, Lao PDR has no accessibility or interconnectivity with other surrounding GMS countries.

**Phase 2:** The country first opened up to the world in 1982 and the major reforms "the New Economic Mechanism" in making decisions related to local and international markets was introduced in 1986. The country has been working on the transition towards an open-market economy<sup>2</sup>. This led to the opening up of the economy to foreign investment and trade. Since 1989, there were further reductions in trade restrictions and additional permanent crossings were opened. During this time frame the government continues its efforts in both the construction of new road networks and also improvements to interregional highway conditions. At a local level most of the road networks have been expanded from the core districts within the province outward to link with other networks of the other provinces. At international level most of the road

<sup>1</sup> Centrally Planned Economic System: Centralization, Public (Collective) Ownership, Administrative Process, Non-competition, Orders, Economic Protectionism  
<sup>2</sup> Open Market Economic Systems: Decentralization, Private Ownership, Markets, Competition, Incentives, International Economic Integration.

networks have been expanded from the core districts of the main provinces, which are located at the Thai border side, such as Chanthaboury (Vientiane Capital), Khanthaboury (Savannakhet), Thakek (Khammoun), Pakse(Champasak), Xuaxai (Bokeo) etc. to other part of the country connecting to Vietnam in the western direction, China in the northern direction and Cambodia in the Southern direction. During these periods the land transportation's integration as well as the level of accessibility and connectivity within GMS countries has increased gradually. However, in this phase border trade by ferry along/crossing Mekong was a dominant transport mode, linking with the improved land transport network within the country.

**Phase 3:** The completion of the first Lao-Thai "Friendship Bridge" spanning the Mekong River and linking Thanaleng (Lao PDR) to NongKhai (Thailand) opened to traffic in April 1994. This enabled the country to gain from transit trade and investment linkages with the surrounding countries. It is clear that this bridge has resulted in the tremendous improvement in the transport accessibility and interconnectivity within the GMS countries. Since the transport of goods among GMS countries faster and more reliable, therefore the share of freight and passenger by land transport in Lao PDR has been continually increasing, while the percentage share of the water and air transport has been decreasing - replaced by land transport. In addition, the length of the roads increased significantly to respond to the need of the increased transport volume throughout the country during this time frame. This resulted in the significant improvement of the accessibility level of certain areas, especially the city along the main integrating routes.

**Phase 4:** The opening of the second bridge in 2006 at Savannakhet/Mukdahan was important. Currently, there is an extensive development of transportation and communication links in Lao PDR for Savannakhet Province. The construction of a bridge crossing the Mekong River to link Thailand to Vietnam via Lao NH9, is one example of the development in this area. Not only that, the NH9 eases communication from border to border, but it is also connected with the high standard national highway route number 13, which will facilitate transport of goods from this area to northern and southern provinces. With such a complete network, goods from this border trade area could be transported easily and effectively. In this time frame, the improved transport system developed together with the completion of this new bridge the in Savannakhet Province definitely facilitated better access to international markets.

The improved transport system during the last three decades in Lao PDR facilitated better access to international markets. Due to its own characteristics, together with the government policy the improved transport system reflected the better transport capacity, efficiency, reliability and level of service. Simultaneously, the transportation and transit time saving have been improved significantly.

## 1.2 Transportation Productivity

Following the time-series analyses of the major variables, which determined the increased accessibility/interconnectivity, capacity, efficiency, reliability and level of service due to the improved integrated land transport network, the analysis of the transportation productivity, has also been performed. The general observations are noted here:

During phase 2 before the completion of the bridge, people could pass the Mekong by ferries for 30 minutes. After the completion of the first international bridge (phase 3), it could be observed that the passing time has been reduced dramatically. In average, the number of passengers grows at 30-40% recently. The bridge contributes to absorb this high growth of passenger movements.

The traffic volume on the bridge increased gradually. In 1999, the total volume was recorded for 211,541 vehicles for both directions. The number was equivalent to 290 vehicles per day per direction.

As the improved and extended of the transport network within the country and the completion of the first Mekong bridge, has contributed to supply more convenient and reliable passing measures over the Mekong, it is therefore the freight and passenger transport volume within the Country has been increased dramatically. But it is notably that, the freight and passenger transport by ferries still are in places in many border provinces along the Mekong which accounts for large percentage of the transport volume as well. Transport productivity could be summarized as follows:

- (i) The transportation growth rate has been increasing in accordance with the country's increased accessibility and interconnectivity.
- (ii) It is quite obvious that the land transport shows the highest growth rate, while the lowest growth rate is transportation by sea and by air respectively.
- (iii) The majority share of the freight and passenger transport is land, water and air transport respectively.
- (iv) The share of freight and passenger by land transport has been continually increasing, while the percentage share of the water and air transport has been decreasing - replaced by land transport.

The completion of the Second Mekong International Bridge and an improved Route 9 in Savannakhet Province has been obviously improved the integration level among GMS countries. Savannakhet Province is the access point to connect Bangkok and north/central Vietnam. Subject to capacity expansion and fee reduction at Danang Port, the link from Savannakhet Province to Danang is expected to be a gateway to the East Asian Market (e.g., Taiwan, Korea and Japan). The concept of the East-West Economic Corridor proposed by ADB is to link major cities and towns located between Mawlamyine (Myanmar) and Danang (Vietnam) via Mukdahan (Thailand) and Savannakhet Province (Lao PDR). The corridor crosses the center of the Indo-China Peninsula. It forms a land bridge between the South China Sea and Andaman Sea.

As addressed in the case study of Vientiane Capital and Savannakhet regarding the distance and cost of land transportation, the results has shown that certain areas in CRB and two main provinces (Savannakhet and Khammouane) in Lao PDR has improved access to the seaport in terms of distance as well as of costs and time. The integrated land transport would benefit to trade between or among three countries, especially, Thailand and Vietnam. It could reduce transportation time from 2 weeks by ship to 2-3 days by truck and reduce transportation cost as well. It is clear that the improvement of the integrated transport, especially the Second Mekong Bridge, have definitely brought about the reduction in transport distances, hence an increase in transport volume and economic activities, resulting in the significant changes in both economical-social and physical conditions of the related areas.

It is obvious that the revolution happened mainly due to the development of land transport which is integrated GMS countries, resulted in an increased freight and passenger transportation within the country.

### **1.3 Improved Trade, Increased Regional Attractiveness and Economic Growth**

In the pre- New Economic Mechanism, there was not much economic integration between Lao PDR and other countries. However, due to the opened door policy, followed by a better infrastructure set-up, in particular the expanded land transport network connecting to the neighboring countries being improved; the external trade has grown significantly.

The most distinctive improved trade could be seen after the completion of the first Mekong Bridge, as addressed in the previous chapter. As the bridge contributes to supply more convenient and reliable passing measures over the Mekong, as the traffic and passenger volumes over the bridge grow, the trade also increased. The trade of Lao PDR with neighboring

country, particularly with Thailand has been expanded continuously. In addition the exports to the EU, mainly garments, have grown from a negligible level in 1990 to US\$ 118 million in 2000.

The effect of the increased productivity is the improved trade and economic opportunities, including regional attractiveness to industry. This can be seen from the analysis of the expansion of the external trade and the new industrial establishments in each province. This is because increased transport productivity is related closely with the reduced transport cost, as well as the transport efficiency, reliability and effective level of services. The efficient transport networks have brought about structural changes to the country's industry and a diversification of the consumption patterns. Goods are now transported on a 'just-in-time' basis to meet consumer demands. Land transport networks support diverse lifestyles, industry, and create opportunities for local communities, as evidenced by the number of new industrial establishments located along the national highways.

Increased economic activities within the regions are the main factors of the economic growth of the region. Economic activities have a great impact on the economy. The increasing in the economic activities in the region attracts the migration of the people to the urban area to seek greater income, a functional and free urban life, and better housing and social infrastructure. A rapid economic growth and increased population trend; accompanied by land and infrastructure development became the driving force of the urban development within the region.

As already mentioned, the most encouraging factor in recent years has been the significant growth of the gross domestic product (GDP). The available statistical information (chapter 4) indicates a rapid increase in GDP industries at the current price of every sector. The key factor behind this success has been the opened door policy; together with the provision of the better infrastructure facilities, both have created more opportunities for the private sector in economic activities. More importantly, external trade between neighboring countries, ASEAN and foreign countries, including foreign direct investment inflow rapidly increased, and this leads to progress in the number of manufacturing industries in Lao PDR. Agriculture is still subsistence-based in nature and accounts for a little over 50% of GDP. The industrial sector is considered a high growth industry. The number of the new industry-handicraft manufacturing establishments in each province during the last three decades has shown a rapid upward trend. The industrial sector has an annual growth rate of approximately 9-10 %. The industrial share in the composition of GDP has also increased from 17% in 1992 to a little over 23 % in 2001. During the past years, the manufacturing sector accounted for 75 % of industrial output, and has grown at an average of 10-12 %. The service sector accounts for 26 percent of GDP. Transportation and retail are strong major sub-sectors. Tourism has become a significant sub-sector contributing an

enormous amount of foreign currency earnings to the government's budget. The growth in tourist arrivals has increased rapidly over time. Simultaneously, hotels and restaurants have been developed and expanded in terms of quality and quantity.

## **2. The Impact of Integrated Land Transport Network on Population Agglomeration and Urban development and Its Correlation**

- The important finding in chapter 4 regarding the utilization of GIS software to detect the location of expanded urban areas has shown that new settlements are beginning to form along the national road networks and at border crossings. In addition, existing settlements have also been formed as new urban areas. This type of urban growth is categorized as "*linear branching*" representing a new road or new linear development surrounding by non-urban settlement and some distance from existing urban areas.
- By investigating the population growth trend of 17 provinces in Lao PDR several observations could be made.

- The population of Lao PDR in 1976 was 2.886 million. This compared with 5.785 million in 2005 and implies an average annual growth rate of 3.2 percent. Based on the land integrated transport network development phase basis, the growth rate varied from 1.4 percent in the first phase (1975-1985) to 2.6 percent in the second phase (1985-1995) and in the third phase (1995-2005) the growth rate was 3.8 percent which is much higher than that in the first period.

- During the *initial integrated land transport development phase* (1976-1980), the growth rate can be seen both in positive and negative figures, implies that there were both declination and growth of the population within the country. During this phase the equal growth rate population could be seen ranging from 2.09% - 2.84%. It should be noted here that after 1984 Vientiane was divided into Vientiane Capital, Vientiane Province, and Borikhamxay Province. Luangnamtha province was divided into Luangnamtha Province and Bokeo Province. Saravan province was divided into Saravan province and Sekong province. Xaysomboun SR was established after 1990, which its area partially taken from Vientiane province and Xiengkhuang province.

- In the *second integrated land transport development phase* due to the opened door policy, the growth rate varied across the country. The highest growth rate occurred in Bokeo Province which is a town bordering with Thailand with the annual growth rate of 10.54%. The remaining



provinces have a relative smaller growth rate in which the highest growth rate could be seen in Vientiane Capital, with the growth rate of 3.96%. The lowest growth rate could be observed in Vientiane Province, Oudomxay Province, Huaphanh Province and Luangnamtha Province, with the annual growth rate of 0.75%, 1.16%, 1.65% and 1.73% respectively. In this period, due to the poor condition of the land integrated transport network the town with relied on water transport for the trade border accommodate more population since this area provided better job opportunities and attracted more population settlement.

- During the *third integrated land transport development phase* (after 1995), with the competition of the first International Mekong Bridge, several observation could be seen as follows:

- The Highest annual population growth rate could be observed in Borikhamxay province and Vientiane Province with the annual growth rate of 3.64% and 3.55 % respectively. Borikhamxay Province is a starting node of R13S which is the main route directing to the Southern part of Lao PDR (*Road No. 13 which is the North - South corridor to connect China to Cambodia*) which are the major GMS strategic integrated road networks. Similarly to Vientiane Province which owned the major GMS strategic integrated road network namely, R13N which is the main route directing to the Northern part of Lao PDR.
- During the second phase Bokeo Province accounted for the highest growth rate of 10.52%, however due to the expanded integrated land transport network and the completion of the first international bridge, the land transport has been played an important role across the country. The growth rate of Bokeo province during the third phase is 2.61 % which has been decreased sharply implies the reduction in the important role of border town functions.
- Regarding an increased and decreased annual growth rate during phase II-III. The highest increased growth rate can be seen in Vientiane province (2.8%) and in Oudomxay province (1.4%). As shown in the map, Vientiane province and Oudomxay province locate at the starting and end node of the main road (R13N) linking Vientiane capital to China. As the completion of the first international bridge and the expanded network to Northern, Southern, and Eastern part, a freight and passenger transport along this road as well as the economic activities have been increasing significantly, resulted in the increased population agglomeration of these related areas. While the highest decreased growth rate during phase II-III could be observed in Bokeo province, which is a border town relying on the water transport for trading with neighboring country for last two decades. Since 1995 land transport of Lao PDR integrated with neighboring country has been continually increasing, the transport of goods among GMS countries

faster and more reliable, therefore the share of freight and passenger by land transport in Lao PDR has been continually increasing, while the percentage share of the water transport has been decreasing - replaced by land transport. The population has been rather settled along the major road; hence the annual population growth rate has dropped sharply.

- An analysis of the extent and growth rate of the population agglomeration at district level is performed by looking at the percentage of the population agglomeration share of the district itself relevant to its province within two periods i.e. 1995 and 2005. The analysis at district level of 5 provinces which are border entry province i.e. Bokeo Province, Vientiane Capital, Khammouane Province, Savannakhet province and Champasak province during phase II and Phase III showed that since 1985, most of the districts of these provinces that locates along the Thai border has the highest percentage of the population share. This is because of the fact that these districts have a long history of border trade with Thailand. However the calculation of the different of the percentage of the population share during 1995-2005 evidenced that the tendency of the population growth occurs at the other sides. The reason of these phenomena could be explained by the expanding of the integrated land transport network from the Thai border side to Vietnam, China and Cambodia border over time. The completion of the first international bridge on the Thai side has further facilitated the movement of goods and passengers, resulted in the tremendous change in the economic activities and population agglomeration across the country. The analysis has addressed the fact that previously the most of the population growth other at the Thai border as the degree of the integration has been increased the population tends to settle in other side, implies that the existence of the tendency of the equalization of the population in Lao PDR
- A correlation of the impact of integrated land transport network on population agglomeration is conducted to verify the existence of the impact on population agglomeration.

- The correlation between the increased traffic volume and the increased annual population growth was analyzed to verify the impact of the increased traffic volume caused by the improved integrated land transport network on the population growth. The analysis found that the areas which are starting and ending nodes of R13N (Vientiane province, Oudomxay province) which accommodate a highest percentage increase of average dairy traffic has a highest increased annual population rate. Similarity to the areas which are starting and ending nodes of R13S

(Borikhamxay Province and Champasak-Attapeu) have a highest increased annual population rate.

- Regarding the correlation of the improved integrated land transport network and the population agglomeration by looking at the relationship of two representing variables i.e. the length of the roads for the whole country and the standard deviation value which refers to the dispersion of the annual population growth rate. The results showed that as the lengths of the roads for the whole country has been increased the dispersion of the annual population growth rate has been decreased. This correlation illustrates the impact of the improved integrated land transport network to the equalization of the annual population growth rate. In other words, it can be simply said that the expanded of transport network throughout the country leads to the growth and an equal growth rate across the country

- The correlation of integrated land transport network on population agglomeration in Lao PDR could also be verified by analyzing the correlation of the increased transport volume (freight and passenger) and population agglomeration. The results also showed that the increased transport volume is also caused by the improved integrated land transport. As the transport volume tends to increased, somehow reflected to the increased economic activities in the related areas, it brings about the new settlement of the population in related areas. In other words, it can be simply said that the more transportation implies more economic activities throughout the country leads to the growth and an equal growth rate across the country.

- The correlation of the variability of the annual population growth rate in each time frame and the degree of integration is performed. The variability of the annual population growth rate in each time frame represents the population agglomeration and the degree of integration represents the improved transport network. The results showed that during the last three decades as the degree of integration increased, more population equalization could be found.

The results of the analysis of the correlation of the impact of integrated land transport network on population agglomeration had shown the existence of the impact on population agglomeration.

- The Impact of Integrated Land Transport Network on Urban Development in Lao PDR

- The research utilizes spatial statistical analysis function of GIS software i.e. MapInfo and Arc View to handle spatial attribute data in order to identify the location of expanded urban areas. The land use is categorized into different type of land use, including urban areas.

- In 2003, the urban population in Lao PDR accounted for 18.82% within the whole country. It was estimated that approximately 28.15 % of the urban population of Lao PDR was in Vientiane Capital City, and 15.62%, 9.53%, 6.96% and 6.74% was in, Champasak, Savannakhet, Loungprabang and Sayabury respectively. It is notable that although Savannakhet Province accommodated the largest population in the country, the urban population was only 9.53%. There is a similarity to Khammouane, which has about 3.64% urban population. The lowest urban population was in Phongsaly province with only 0.49%.

- The highest percentage of the urban population of the total population in its province could be seen in Vientiane Capital with 46.21%. Similarly to, Attapeu, Champasak and Borikhamxay with are accounted for 32.69%, 26.84% and 25.81% respectively. These figures has shown that the highest urban development within the province itself can be found in Vientiane Capital, in contrast to Savannakhet province that has quite low percentage of this figure.

- The highest urban population mostly is in the urban area which is classified as a secondary town and provincial capital, which are supported by the urban planning policy and displayed functions as centers of economic-social and political activities, and therefore accommodate large urban populations.

- The highest urban population mostly is in the urban area which is classified as a secondary town and provincial capital. Other observations are that most of these urban areas are located at the major nodes along the major roads namely, R13S/R13N and EWEC. Regarding the border trade effect, most of the highest urban populations are in the areas bordering Thailand, rather than Viet Nam, Cambodia or PR China.

- By comparing Vientiane Capital and Savannakhet Province it can be seen that Savannakhet Province has accommodated the largest population in the country since 1985. However the population growth rate of Vientiane Capital is higher than those of Savannakhet Province. The growth rate of Savannakhet Province from 1976-1980 is 2.82%, 1980-1995 is 2.29% and 1995-2004 is 2.24%, while Vientiane capital the growth rate is 3.96% and 3.13% in phase 2 and phase 3 respectively.

- Although Savannakhet Province has accommodated a large proportion of the total population, its urban population and urban area are much smaller than those of Vientiane Capital. The urban population and urban area of Savannakhet Province account for only 12.21 % of total population and 0.47% of total area. These figures imply that there are numerous dispersed settlements inside Savannakhet Province.

- The analysis of the changing of the population of Vientiane Capital and Savannakhet Province at district Level during 1999-2005 at district level shows that in 2005 the highest population is found in Xaythany District, which is a district along Road Number 13 and Road Number 10. Xaythany District also has a highest increased population (1995-2005).

- The highest population density can be observed in Sisattanak District with the figure of 1908 person/km<sup>2</sup>, while in Savannakhet Province the highest population density is only 183 person/km<sup>2</sup> in Khanthabouly District.

- In Savannakhet Province the highest population can be seen in Khantabury District as expected. This is because of the fact that Khantabury District is a provincial capital of Savannakhet province and a secondary town in addition to being a major node of EWC corridor and sharing border with Thailand. However, the increased population has shown the negative figure, implies the decreasing in the population agglomeration during ten years. The reason behind this phenomenon could be explained by the huge equally increasing of new settlement in other districts due to the improvement of the land transport network throughout the province.

**Table 6.1 Lao PDR Conditions and Its Policy**

Phase I (1975-1985)	Phase II (1985-1995)	Phase III (1995-2007)	Phase IV (2007 on ward)
<p>- The change in government and policy system in the end of <b>1975</b>, the government used the centrally planned economic system as an instrument to manage its socio-economic development. Regarding the relationship between people of Lao PDR and neighboring countries, Lao PDR closed its entire border since this was related to political policy and security.</p> <p>- In June 1978, a trade agreement between Lao PDR and Thailand was signed and the trade relation was re-established, however with cautions and restrictions.</p>	<p>- The country first opened up to the world in <b>1982</b>.</p> <p>-The adoption of a dynamic reform policy called the New Economic Mechanism in <b>1986</b> transforms the economy from a centrally planned to a market system, allowing all economics sectors to play an active role in business enterprises. Under this policy, Government of Lao PDR promotes competition in the market and encourages joint ventures between local and foreign investors with out political or legal discrimination. As Lao PDR continues to move from a "command" economy toward a more market oriented economy, from a subsistence farming economy into more diversified and commercialized ventures, international trade will continue to grow in importance. Regarding the bilateral trade between Lao PDR and Thailand, several restrictions have been relaxed, including removing many items from the lists of prohibited supplies, opening of additional trading posts and relaxing the daily limit on the value of border trade.</p>	<p>- The reform accelerated after Lao PDR accession to the ASEAN and the joining of AFTA in <b>July 1997</b>. The relations between Lao PDR and other countries in trade and economics has been enhanced, particularly the completion of the first Mekong International bridge, the more reliable and convenient integrated regional land transport network, facilitated better access to both domestic and international markets and services.</p> <p>- The adoption of a stabilization program since <b>2000</b> and the implementation of a phase's program of reforms since 2001- in public expenditure management, banking, sate-enterprises, forestry, and trade has contributed to this improvement<sup>3</sup>.</p> <p>- A Joint Trade Committee (JTC) was established on <b>22 May 2000</b>. The first JTC meeting was held by Thailand during 16-17 July in Bangkok. Accordingly, an agreement on road transportation was signed on <b>17 August 2001</b>. In addition Lao PDR has been given permission from Thailand for transportation of goods in transit to and from a third country. During these periods the land transportation's integration within GMS country has been increased gradually. Together with open door investment policy of Lao PDR to increase the investment cooperation with Thailand, which leads to the further increased transportation of</p>	<p>Accelerate economic growth and improve people's quality of life, restructuring economy and employment structure in building market economy, based on the country's rich resources and international integration. Further build market economy with socialist orientation. Continue enlarge and develop effectively external; economic relations. Create a breakthrough changes in education and training in terms of quality and quantity, using achievement in sciences and technology, protecting environment, taking human, sciences and technology factors as a vehicle for development. Develop culture, society in synchronously with economic growth. Continue poverty reduction, crating jobs, eliminating social evils. Continue strengthening socio-economic infrastructure as fundamentals fro development in 5 year plan and for next year plan. Maintain political stability and social security, protecting sovereignty, untouched territory and</p>

	<p>- Since 1989, there have been further reduction in trade restrictions and additional permanent crossings were opened.</p> <p>-More items were removed from the control list. The most recent amendment of the trade agreement was made on 20 June 1991. On 19 February 1992, a trade agreement was signed between Thailand's Board of Trade of Thailand and Lao PDR Federation Industries.</p> <p>- In 1992 with the assistance of the ADB, the six countries that share the Mekong River— Lao PDR, Cambodia, Myanmar, Thailand, Viet Nam, and Yunnan Province of the People's Republic of China (PRC)—launched the Greater Mekong Sub-region (GMS) Program. The six countries entered into a program of sub-regional economic cooperation, designed to enhance economic relations among the countries.</p>	<p>goods and passengers, resulting in both economic and urban development within the country.</p> <p>-The government has also been continuing its reform efforts. The National Poverty Eradication program, articulating a medium term program of reforms and public spending program has been discussed at the National Assembly. Various actions have been taken during 2003, in respect public expenditure management, state-enterprises, banking, natural resource management, and trade and private sector development even if they were taken more gradually than was originally expected.</p>	<p>national security (<i>Sixth National Socio-Economic Development Plan 2005-2010 (CPI, 2005)</i>).</p> <p><i>Northern region:</i> Focus will be made to create socio-economic infrastructure which is important and necessary for integrating the regional economy with the sub-region in accordance with the plan of GMS and those that have regional and local significant.</p> <p><i>Central region:</i> Optimizing the use of the existing EWEC infrastructure and encouraging the development of the special economic Savannakhet - SENO zone as well as border trade between Savannakhet and Lao Bao.</p> <p><i>Southern Part:</i> Step up the development of the Southern region's economy which is based on the economic master plan for the Lao PDR-Vietnam- Cambodia triangle and the Lao PDR Vietnam Cambodia emerald triangle. This is integrate regional and sub-regional economics.</p>
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**Table 6.2 Improvement of the Integrated Land Transport**

Phase I (1975-1985)	Phase II (1985-1995)	Phase III (1995-2007)	Phase IV (2007 on ward)
<p>The government has been taken steps since its establishment after 1975 to improve the road situation. There were not much improvement in the transport network within the country</p>	<p>During the 1980s the largest portions of the road investment were allocated to new networks such as the access road to the district and villages. Constructions of these new alignments were needed in order to increase the accessibility of all the villages in the provinces. A small portion of the road investment was used in physical improvements such as realignment, pavement and safety concerns. The expansion of the existing road network, together with the provision of other infrastructure facilities, has been stressed during this period according to the policy of the Lao government in eradicating the poverty of the population of the whole country. As the result, numbers of large districts were integrated into other areas by the expansion of the new road network in 1990s.</p> <p>At a local level most of the road networks have been expanded from the core districts within the province outward to link with other networks of the other provinces. At international level most of the road networks have been</p>	<p>- The Lao-Thai "Friendship Bridge" spanning the Mekong River and linking Thanaleng (Lao PDR) to NongKhai (Thailand) opened to traffic in April 1994. It is clear that this bridge has made the transport of goods between the two countries faster and more reliable. Located at the center of an expanding regional economy, Lao PDR could also capitalize from the growth in development opportunities of its three immediate neighbors (Yunnan (China), Viet Nam and Thailand). Lao PDR faces the challenge of its integration into the global economy as long as the current move toward liberalization is not reversed or stalled. The country has been changing in a very fundamental way under the impact of various interacting forces of economic integration that are shaping GMS economic landscape. Trade policy Lao PDR, has been integrating gradually into the world economy since 1989.</p>	<p>The opening of the second bridge in 2006 at Savannakhet/Mukdahan.</p> <p>Improvement of the National Highway route number – (NH9), which is considered as the Asians strategic highway connecting the East with the West of the region. It stretches in an easterly direction, from Laos-Vietnam border through Vietnam to the South China Sea giving access to China, Hong Kong, Taiwan, Indonesia, The Philippines, Korea, Japan and North and South America. Going in a westerly direction across the new bridge at Savannakhet/Mukdahan it provides access to Thailand, Myanmar, Malaysia, and Singapore and via the Andaman Sea to India, Africa, Middle East and Europe.</p>



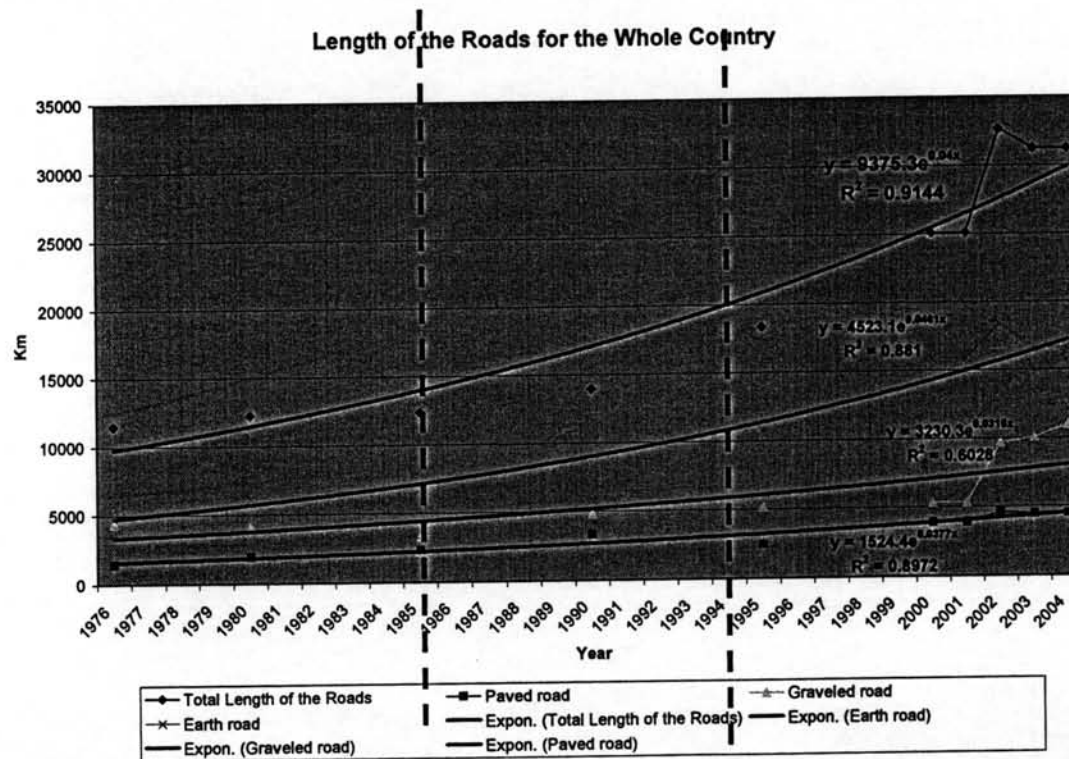
	<p>expanded from the core districts of the main provinces, which are located at the Thai border side, such as Chanthaboury (Vientiane Capital), Khanthaboury (Savannakhet), Thakek (Khammoun), Pakse(Champasak), Xuaxai (Bokeo) etc. to other part of the country connecting to Vietnam in the western direction, China in the northern direction and Cambodia in the Southern direction. During these periods the land transportation's integration as well as the level of accessibility and connectivity within GMS countries has increased gradually. However, in this phase border trade by ferry along/crossing Mekong was a dominant transport mode, linking with the improved land transport network within the country.</p>		
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<b>Phase I (1975-1985)</b>	<b>Phase II (1985-1995)</b>	<b>Phase III (1995-2007)</b>	<b>Phase IV (2007 on ward)</b>
non integration level with other countries	The ferry and water transport were the dominant transportation means reflected in a limited integration level with other countries	The integration level with other countries has been moderately improved since the completion of the first Mekong International Bridge	The integration level with other countries has been significantly improved since the completion of the second Mekong International Bridge which provided other alternative land transport routes with less distance and cost.

<b>Phase I (1975-1985)</b>	<b>Phase II (1985-1995)</b>	<b>Phase III (1995-2007)</b>	<b>Phase IV (2007 on ward)</b>
	The major route of commodity flow between Thailand and Lao PDR through ferry and other water transportation means.	<p>The major route of commodity flow between Thailand and Lao PDR was from Nong Khai to <b>Vientiane</b>, followed by the route between Nakhon Phanom and Thakhek. The trade volume of Mukdahan – Savannakhet route is smaller than the above two routes.</p> <p>(i) Bangkok – Udonthani - (Friendship Bridge) – <b>Vientiane</b> - (Route 13, Route 8) Vinh – (Route 1/Route 10/ -Hanoi/Haiphong</p> <p>(ii) Bangkok- Nakhon Phanom - (ferry) – Thakek - (Route 13/12, Route 8)- Vinh (Route 1/Route 10) - Hanoi/Hai Phong</p> <p>(iii) Bangkok – Ubon – Pakse – (Route 18)</p>	<p>The New Mekong Bridge makes the transport route shift from the Nakhon Phanom - Thakhek route to Mukdahan – Savannakhet route.</p> <p>The commodity flow between Thailand and Vietnam via Lao PDR is shifted to utilize the two routes: Savannakhet - Vinh via Routes 13 and 8 to the north Vietnam, and Savannakhet - Danang via Route 9 to the central Vietnam and</p> <p>The domestic goods produced</p>

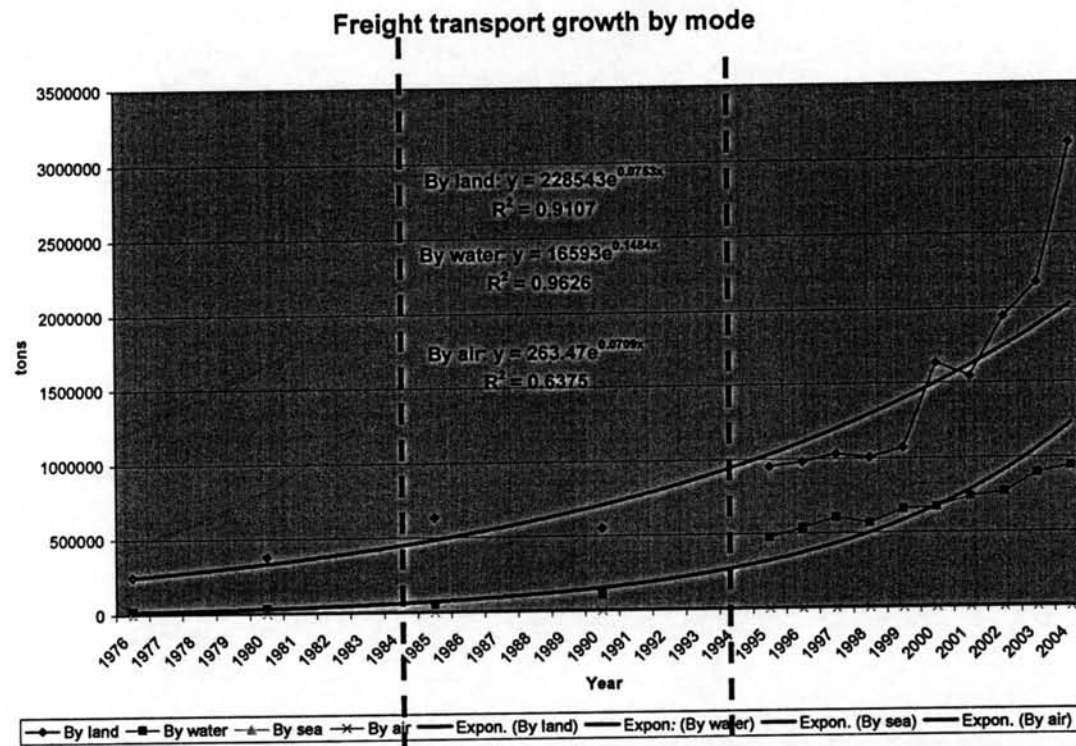
		<p>- Danang</p>	<p>in the central and southern Lao PDR will be collected at Savannakhet and exported to Vietnam and to Thailand.</p> <p>(i) Bangkok – Mukdahan – (Second Mekong bridge) – Savannakhet (Route 13/12, Route 8) – Vinh - (Route 1/Route 10) - Hanoi/Hai phong</p> <p>(ii) Bangkok – Mukdahan – (Second Mekong bridge) – Savannakhet – (Route 9, Route 1) – Danang</p>
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**Table 6.5 Improvement of the Road Network in Lao PDR**



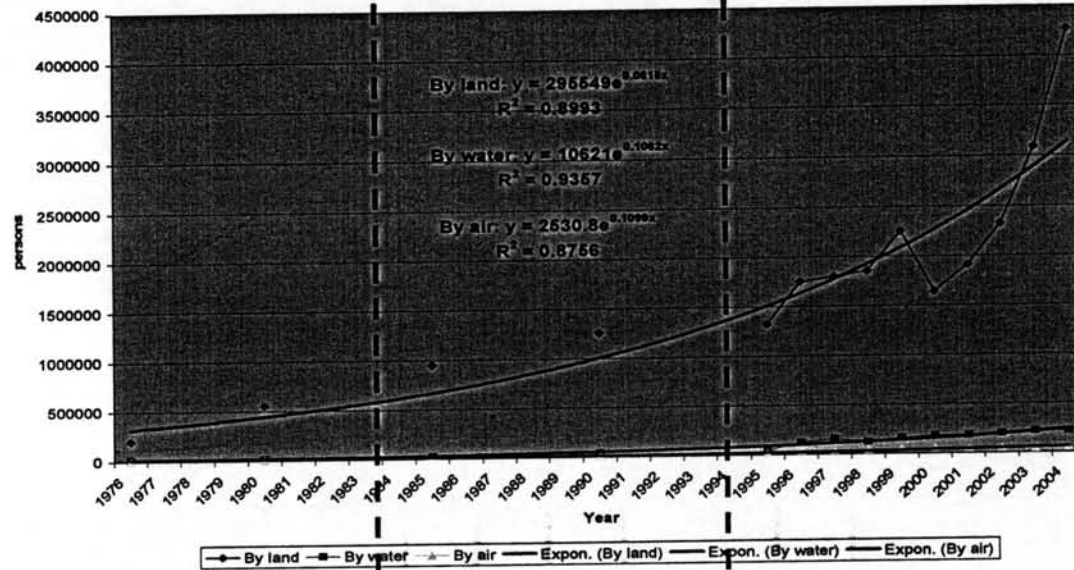
Source: Ministry of Communication, Transport Post and Construction, Lao PDR. (2005)

Table 6.6 Freight and Passenger Transport Development within the Country



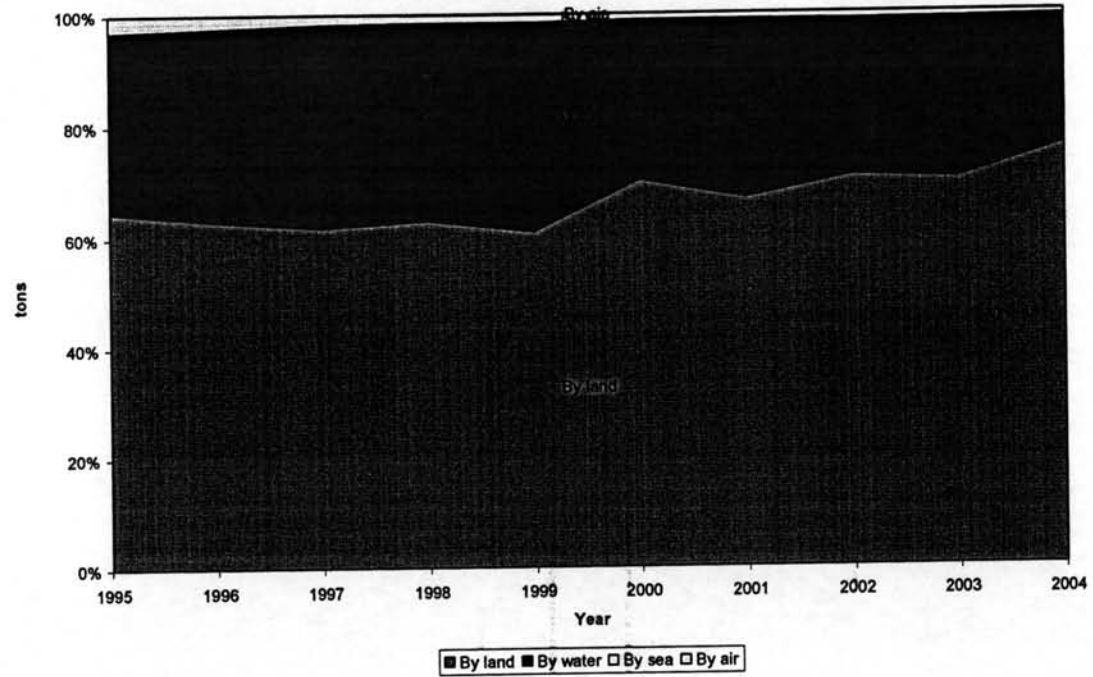
Source: Ministry of Communication, Transport Post and Construction, Lao PDR. (2005)

### Passenger transport growth by mode



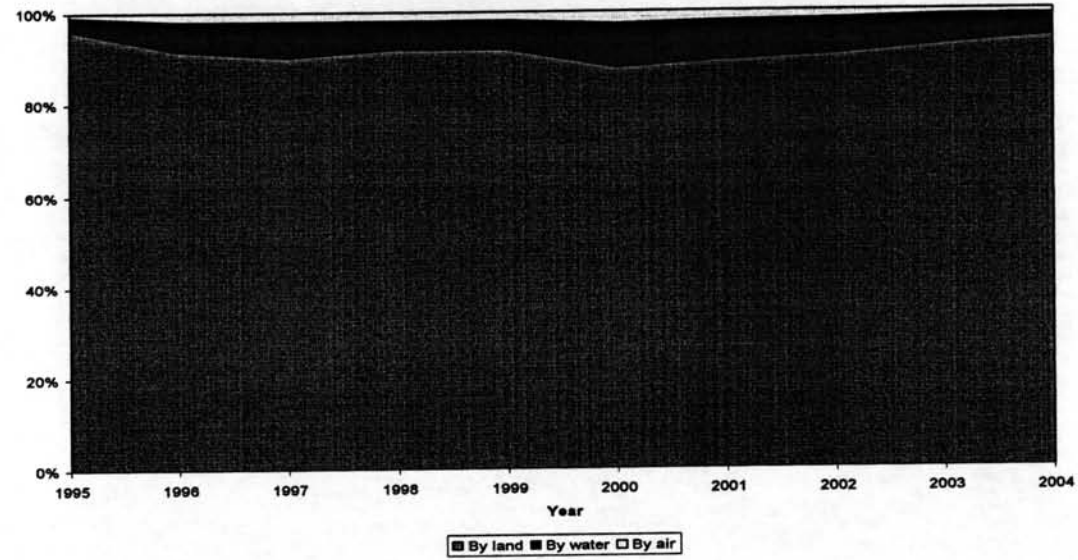
Source: Ministry of Communication, Transport Post and Construction, Lao PDR. (2005)

Freight transport share by mode



Source: Ministry of Communication, Transport Post and Construction, Lao PDR. (2005)

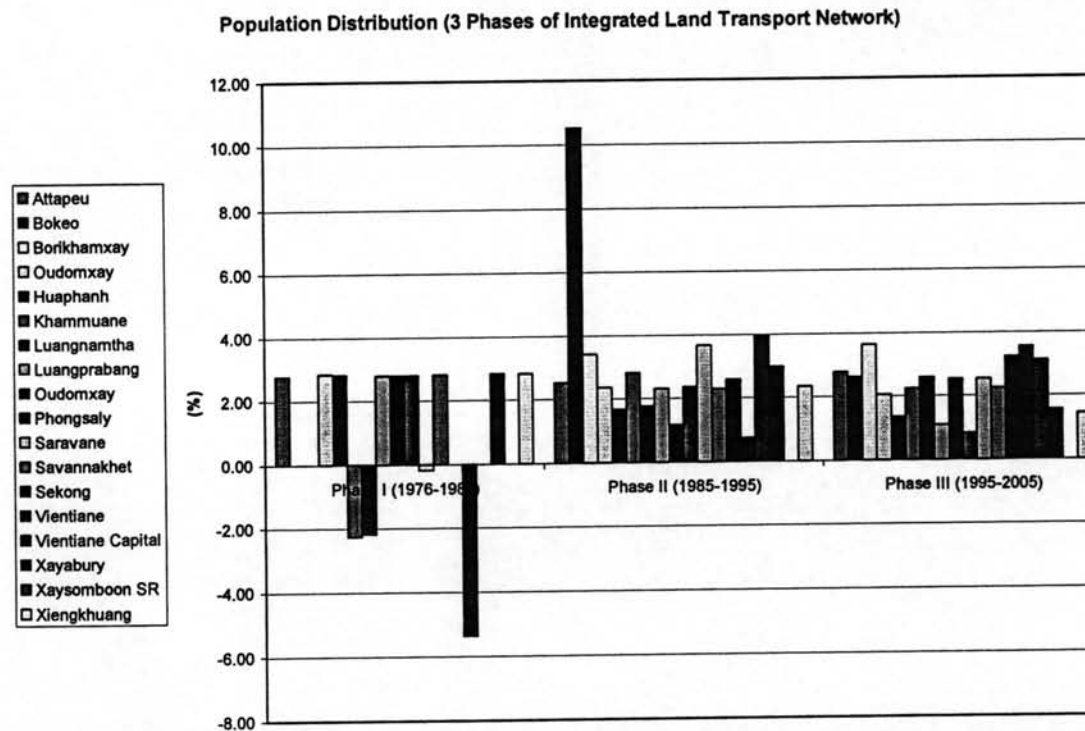
Passenger transport by mode



Source: Ministry of Communication, Transport Post and Construction, Lao PDR. (2005)



**Table 6.7 Population Distribution within the Country ( Phase I, Phase II & Phase III)**



Name of provinces	Phase I (1976-1985)	Phase II (1985-1995)	Phase III (1995-2005)
Whole country	1.35	2.6	3.8
Vientiane Capital	NA	3.96	3.13

Luangnamtha	-2.19	1.76	2.59
Oudomxay	2.80	1.18	2.54
Bokeo	NA	10.52	2.61
Luangprabang	2.80	2.32	1.08
Huaphanh	2.83	1.67	1.36
Xayabury	2.84	2.98	1.56
Xiengkhuang	2.82	2.34	1.43
Vientiane	-5.37	0.74	3.56
Borikhamxay	NA	3.41	3.64
Khammuane	-2.26	2.81	2.24
Savannakhet	2.82	2.29	2.24
Saravane	-0.17	3.67	2.54
Sekong	NA	2.59	3.24
Champasack	2.85	2.37	2.06
Attapeu	2.78	2.53	2.77

Source: Author's Compilation Based on Data from National Statistic Center (Population and Housing Census)

**Table 6.8 Population Change in Lao PDR during the Last Three Decades (Population Ranking)**

Rank	Population 1985	Province	% Growth rate per year (1976-1985)	Rank	Population 1995	Province	% Growth rate per year (1986-1995)	Rank	Population 2005	Province	% Growth rate per year (1995-2005)
1	549	Savannakhet	2.82	1	675	Savannakhet	2.29	1	826	Savannakhet	4.48
2	407	Champasak	2.85	2	532	Vientiane Capital	3.96	2	698	Vientiane Capital	6.25
3	381	Vientiane Capital	-	3	503	Champasack	2.37	3	607	Champasack	4.12
4	298	Luangprabang	2.8	4	367	Luangprabang	2.32	4	407	Luangprabang	2.17
5	267	Vientiane	-5.37	5	293	Xayabury	2.98	5	389	Vientiane	7.13
6	226	Xayabury	2.84	6	287	Vientiane	0.74	6	339	Xayabury	3.12
7	215	Khammouane	-2.26	7	275	Khammouane	2.81	7	337	Khammouane	4.47
8	212	Huaphanh	2.83	8	258	Saravan	3.67	8	324	Saravane	5.09
9	189	Saravan	-0.17	9	247	Huaphanh	1.67	9	281	Huaphanh	2.73
10	189	Oudomxay	2.8	10	211	Oudomxay	1.18	10	265	Oudomxay	5.08
11	163	Xiengkhuang	2.82	11	201	Xiengkhuang	2.34	11	230	Xiengkhuang	2.86
12	124	Phongsaly	2.81	12	165	Borikhamxay	3.41	12	225	Borikhamxay	7.29
13	123	Borikhamxay	-	13	153	Phongsaly	2.37	13	166	Phongsaly	1.64
14	98	Luangnamtha	-2.19	14	115	Luangnamtha	1.76	14	145	Luangnamtha	5.17
15	70	Attapeu	2.78	15	115	Bokeo	10.52	15	145	Bokeo	5.22
16	56	Bokeo	-	16	88	Attapeu	2.53	16	112	Attapeu	5.54
17	51	Sekong	-0.17	17	64	Sekong	2.59	17	85	Sekong	6.48
18	-	Xaysomboon SR	-	18	54	Xaysomboon SR		18	39	Xaysomboon SR	

Source: Author's Compilation Based on Data from National Statistic Center (Population and Housing Census)

**Table 6.9 Urban Development in Lao PDR**

Province	Urban Area	Urban Population 1995	Urban Population 2003	Increase Urban Population (1995-2003)
Savannakhet	Savannakhet	62,247	63,634	1,387
Champasack	Pakse	47,625	48,218	593
Luangprabang	Luangprabang	31,797	40,797	9,000
Khammuane	Thakhek	25,768	33,107	7,339
Vientiane Province	Thoulakhom	21,562	10,459	-11,103
Oudomxay	Xay	15,056	22,389	7,333
Luangnamtha	Namtha	14,451	16,205	1,754
Savannakhet	Outhoomphone	10,957	19,794	8,837
Saravane	Saravane	8,732	13,651	4,919
Sekong	Lamam	7,243	9,112	1,869
Khammuane	Nongbok	7,154	5,832	-1,322
Oudomxay	Hoon	7,146	9,664	2,518
Champasack	Phonthong	6,892	9,360	2,468
Phongsaly	Phongsaly	5,703	5,183	-520
Vientiane Province	Keo Oudom	5,629	6,216	587
Xiengkhuang	Pek	5,606	29,641	24,035
Huaphanh	Xamneua	5,423	15,391	9,968
Savannakhet	Songkhone	5,223	8,032	2,809
Xayabury	Hongsa	5,202	5,490	288
Bokeo	Huoixai	4,911	13,757	8,846
Luangprabang	Nambak	4,441	5,393	952

Xayabury	Xayabury	4,104	22,622	18,518
Borikhamxay	Khamkeuth	3,833	12,774	8,941
Saravane	Lao ngarm	3,500	4,858	1,358
Champasack	Sukhuma	3,359	6,160	2,801
Savannakhet	Champhone	3,131	10,404	7,273
Attapeu	Samakxixay	3,005	12,961	9,956
Luangprabang	Nan	2958	5,704	2,746
Xiengkhuang	Kham	2934	8,664	5,730
Oudomxay	Beng	2744	5,155	2,411
Champasack	Sanasomboon	2674	5,095	2,421
Luangnamtha	Sing	2573	6,158	3,585
Borikhamxay	Pakxanh	2439	18,660	16,221
Borikhamxay	Pakkading	2238	6,826	4,588
Huaphanh	Xamtay	2101	5,150	3,049
Borikhamxay	Bolikhanh	1708	7,833	6,125
Xayabury	Ngeun	1611	6,053	4,442
Attapeu	Sanamxay	1554	5,824	4,270
Champasack	Paksong	450	6,564	6,114
Champasack	Champasack	0	4,996	4,996
Vientiane Province	Xanakharm	0	5,350	5,350
Xayabury	Kenethao	0	5,526	5,526
Luangprabang	Park Ou	0	5,668	5,668
Vientiane Province	Kasy	0	5,812	5,812
Xaysomboun	Saysomboun	0	6,009	6,009
Borikhamxay	Thaphabath	0	6,293	6,293
Vientiane Province	Km 52	0	6,967	6,967

Champasack	Moonlapamok	0	7,116	7,116
Vientiane Province	Viengkham	0	8,991	8,991
Xayabury	Parklai	0	9,358	9,358
Xayabury	Xienghone	0	10,050	10,050
Attapeu	Xaysetha	0	10,809	10,809
Xayabury	Phiang	0	12,929	12,929
Luangprabang	Xieng Ngeun	0	16,844	16,844
Attapeu	Phouvong		5,063	5,063

Source: Author's Compilation Based on Data from National Statistic Center (Population and Housing Census)

### 3. Summaries

These analyses revealed that the population agglomeration and urban development was closely correlated to the improvements in the integrated land transport network in each time frame. The results of the analysis showed that the integrated land transport network has impacted on the economic growth and also the population agglomeration and urban development process in Lao PDR. The improved integrated land transport has been accelerated the economic growth as well as and provided the equal economic opportunities across the country reflected in the increased tendency of the equalization of annual population growth rate distribution throughout the country during the last three decades.

The outcomes of this research *certainly reflect the effectiveness of the GMS initiatives for regional economic cooperation* which include: policies, agreements, infrastructure and services supporting increased cross border trade and tourism, and they have been especially important in the development of the North-South and East West Economic Corridors (NSEC and EWEC).

### 4. In Lieu of Concluding Remarks and Further Research Suggestion

This thesis has attempted to explore one of the debatable issues in Lao PDR regarding the impact of the Greater Mekong sub-region integrated land transport network on the urban development within the country. This thesis also has attempted to verify the existence of the correlation between the integrated land transport network and urban development in the case of the land locked country with a small population, a weak economic base and that had a strong policy to alter the country itself to become a land-linked country with a different status from other countries in the world.

Currently, Lao PDR faces the challenge of its integration into the global economy as long as the current move toward liberalization is not reversed or stalled. The country has been changing in a very fundamental way under the impact of various interacting forces of economic integration that are shaping the GMS economic landscape. Therefore effective GMS integrated land transport networks and other policy concerned are considered as vital factors in the development in the country and in altering the country itself from a land locked to become a land-linked country.

This thesis is open-ended, and it leaves many topics to be followed up. It must be noted that only three Land integrated transport development phases are reviewed in this thesis, and others are left almost untouched. This is due to the facts that phase 4, i.e. the completion of the second Mekong Bridge had just started by the end of 2006. It is expected that tremendous changes will be observed. Phase 5 can also be expected after the completion of the first international railway connecting Lao PDR and Thailand, which will bring about significant alteration within GMS region.