Acknowledgement

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The Consultant wishes to thank the Steering Committee of the Study on Strategy of Strengthening Transport Linkages Capability in order to accommodate an Expansion of Economic, Trade and Investment Route Project for the useful comments and advice regarding the work of the Consultant including assistance in coordination with other relevant agencies. The Consultant also wishes to thank representatives of those agencies for providing the Consultant with all data and information needed for project implementation, including their participation and exchange of opinion in the seminars and workshops organized by the Consultant. This enabled the Consultant to enhance the standard of the work undertaken.

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The Consultant

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The Study on Strategy of Strengthening Transport Linkages Capability in order to Accommodate an Expansion of Economic, Trade and Investment Route

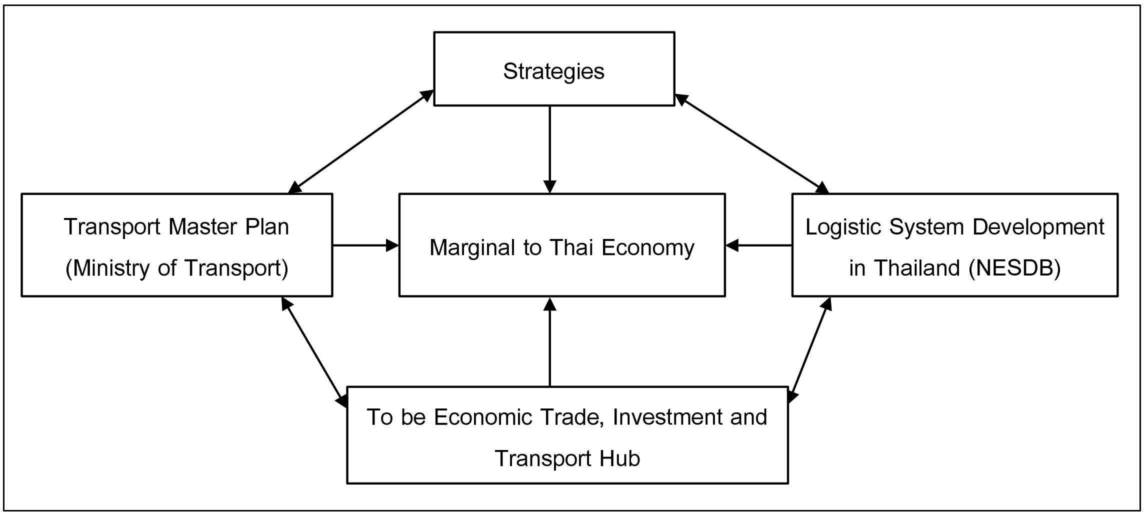
1. Introduction

The Office of Transport and Traffic Policy and Planning (OTP) assigned AMP Consultants Ltd. to carry out "The Study on Strategy of Strengthening Transport Linkages Capability in order to Accommodate an Expansion of Economic, Trade and Investment Route". The focal point of the project is to study, to analyze and to develop the strategy of area development in the context of infrastructure linkage for multimodal transport by land, water and rail including connectivity for freight transport. The result of the study will be used as the Master Plan for the development of transport networks linking the new trade lane to the trading gateways of the country to support intraregional and interregional expansion of economy and trade.

The basic principle and main reason for establishing the project stemmed from the fact that the OTP has observed that Thailand is in a position of geographical comparative advantage among Southeast Asian countries. This factor can lead to reducing international freight transport costs on some routes. This study emphasizes this strengthening advantage of Thailand and, together with the rapid economic growth of China and India, it will provide the opportunity for Thailand to benefit from its comparative advantages. The basic principle of this study, therefore, emphasizes the analysis of **"The Strategy of Strengthening Transport Linkages Capability in order to Accommodate an Expansion of Economic, Trade and Investment Route"** The words **"Expansion of Route**" here can be referred to as **the new trade lane**. The basic important principle of this study, therefore, places special emphasis on the expansion of routes with **"Efficiency"** on the corridor having new economic, trade, and investment potential between Thailand and China or between Thailand and India.

The essential condition for the expansion of the route is the manner of achieving efficiency. The **"Conceptual Framework"** in this study has been defined as the efficient transport linkages necessary to increase the economic benefit to Thailand. Therefore, the study emphasizes the guidelines for strategic planning for the regional economic development of Thailand and for the transport network linking Thailand with the economic, trade, and investment areas of those countries with the most rapid growth in the world and particularly China and India. Since globalization has created changes to cope with developments in the economic system, trade, society and politics, this study, then, places emphasis on the strategic planning of the overall transport network development within the country and links to other important world markets. Moreover, dynamic strategic planning must be coincident with the long term targets and the main policies of the country so that the planned strategies are efficient in relation to changes in the world economic system, trade and investment as well as in relation to the national development plan. The strategic planning in this study, then, is based on two major principles:

- The strategy must be compatible with the Master Plan for Transport and Traffic of the Ministry of Transport and the Strategy for the Logistics System Development of Thailand developed by the Office of the National Economic and Social Development Board (NESDB).
- The strategy must support the policy of Thailand to be the regional hub for the economies, trade, investment and transport in Southeast Asian to enhance the marginal economic benefit of Thailand.

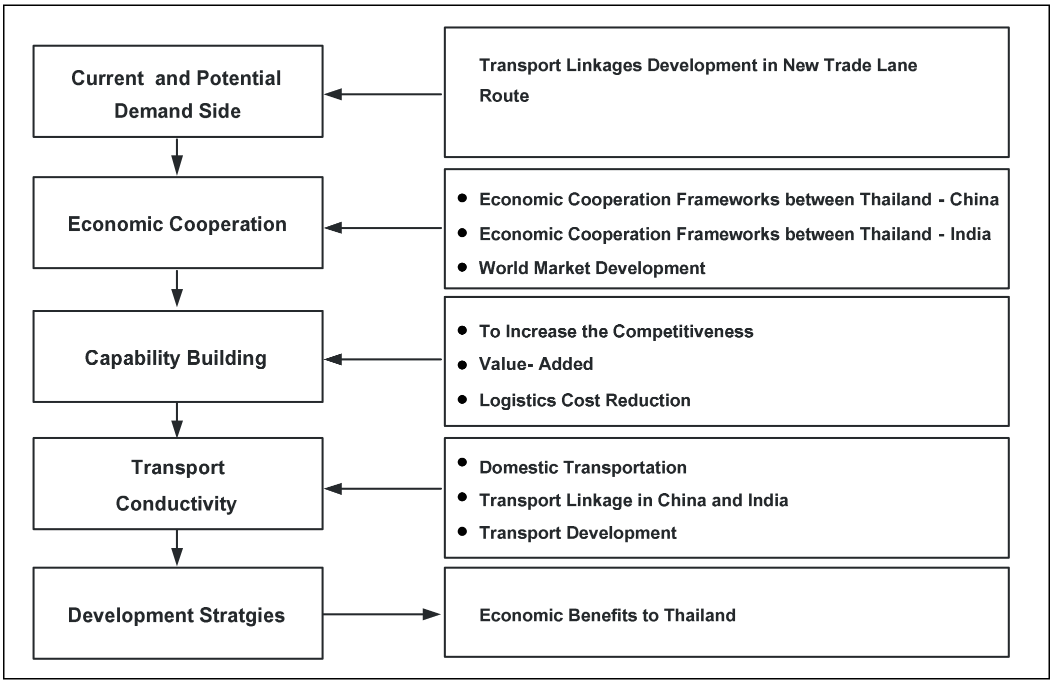


Source: AMP Consultants Ltd.

Figure 1-1 Strategic Planning under Dynamics Condition

The conceptual framework and guidelines for study and analysis for strategic planning (Figure 1-2) and program and project transformation are as follows:

- Study existing and expected demand for goods affecting development of the transport network on the new economic, trade, and investment corridor.
- Study guidelines for the development of cooperation in investment between Thailand-China and Thailand-India to increase the volume of trade between the countries developing and major world markets to the benefit of Thailand.
- Study guidelines for increasing production potential, competitive capability and goods processing in order to create added value and reduce logistics costs for Thailand.
- Study freight transport within Thailand, linkages with China and India, network capacity and establish suitable development guidelines to increase network capacity.
- Study to make known that Thailand gains increased economic benefits from such strategy development.



Source: AMP Consultants Ltd.

Figure 1-2 Conceptual Frameworks of the Study

The result of the study will lead to the strategic planning that gives benefits in three categories:

- The strategic development planning for full efficient usage of the multimodal network within the country by linking with network development on suitable routes with the potential for future strategic development in terms of economy, trade, investment, and tourism.
- The strategic planning that enables Thailand to become the center for business, investment, freight transport and tourism in the Southeast Asian Region.
- The strategic planning for implementation of concerned organizations of the Ministry of Transport so that they can work together in order to achieve the ministerial goals.

2. New Trade Lane and Being the Transport and Economic Center of the Region

The aim of strategic planning for the development of transport network linkage to support the expansion of economic, trade, and investment corridor is to have Thailand as the transport and economic hub for the Region. The new trade lanes that Thailand should concentrate on as the first priority are the routes linking to China and India, the new economic areas of the world with rapid economic growth. The next two priority routes are to trading markets in the Greater Mekong Sub-region (GMS) that are expanding and access to the world energy sources in the Middle East. Such routes are the main supporting factors to promote Thailand with the opportunity for economic production and expansion of economic, trade, and investment corridors.

In the development of such new efficient trade lanes, consideration has been given to changes derived from economic globalization and the comparative advantages of the location of Thailand in two dimensions as follows:

2.1 Transport Network Linkage on the New Trade Lanes between Thailand and World Trading Routes

This route is the corridor that will lead Thailand to become a regional transport hub. The route should be incorporated along the world trading routes between the consumers' markets (the United States of America, the European Union etc.), production bases (Asia etc.) and the major source of inputs (Middle East) amid to the change of the globalization.

Globalization is the process or the change of economic and social phenomenon at local or regional level towards the economic activities of the world society. Globalization can also be described as the process by which the population of the world is merged into one society carrying out common activities. The process appears and is driven by activities in the economy, technology, social culture and politics. However, globalization is normally referred to in economic terms such as the merging of international economic systems through trading activities, and foreign direct investment (FDI), flows of capital, and dispersion of technologies.

Globalization has impacted upon changes and linkages in the economy, trade, and investment in various regions of the world including economic development policy and economic, trade, and investment linkages between Thailand and foreign countries. Globalization has been developed in this way since the establishment of the World Trade Organization (WTO) in 1995 when the leader countries with political influences of the world engaged in reconciliation and ended the cold war. Currently, transnational corporations play the vital role in the place of the leader states of the world such as the United States of America or the United Kingdom. The current phenomena of the global trading system can be observed in two aspects as:

Firstly, the establishment of the WTO has led to multi-lateral agreements becoming the main common standard of trade and fairness for all parties of trading. However, what really happens is the extension of regional agreements established from the political and market forces. Market forces stemmed from the demand for trade expansion within the region in order to expand the economic scale of trade to other regions, and the demand for foreign capital. Political forces stemmed from the need to balance with other agreements in other regions.

Secondly, From world trade statistics since 1980, there have been three striking phenomena as: (1) Export value of industrial goods from developing countries has been increased rapidly, (2) Ratio of trade value in the world market of the developing countries is increasing, (3) Trade values among the countries in the Southern part (South-South Trade), are increasing both for the consumers' goods and the industrial goods. The three new aspects are sometime being called the **New Geography of Trade**.

Globalization has made, at present and in the future, the Asian Region the main area of trading and economic growth derived from the driving force from countries in the Region as China, India, and Korea (South). Changes in business have shown the new market potentials in this Region in 2 aspects as: (1) China is the main driving force for world interregional trading. The trade between China and other countries of the world has a continuous increasing trend and (2) Consumers' demand in the populous markets of China and India is the driving force for the Regional economic growth.

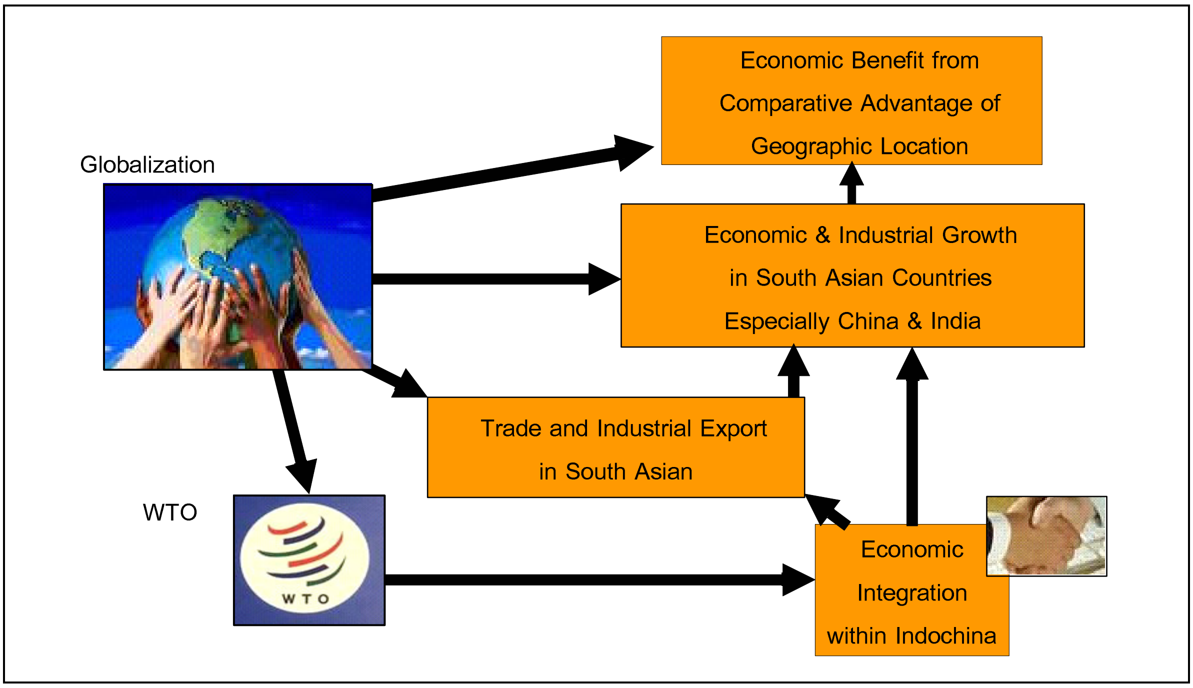
As the country with geographic comparative advantage having transport network linkage trading with China and India through the relationship policy within various cooperation frameworks (Table 2-1), Thailand has the opportunities to create linkages for economy, trade, and investment between the two countries and the markets in other regions through joint operation in harmony with physical natural linkages. (Figure 2-1)

Table 2-1 Potential of New Trade Country Linkage

Country	BIMSTEC	ASEAN/AFTA	GMS	ACMES
Thailand	✓	✓	✓	✓
India	✓	✗	✗	✗
Myanmar	✓	✓	✓	✓
Laos	✗	✓	✓	✓
Vietnam	✗	✓	✓	✓
China	✗	✗	✓	✗

Source: AMP Consultants Ltd.

The geographical location of Thailand enables the country to be the transport hub for economic and trade linkage to the new markets such as China and India. The characteristic of the country's location between the Indian Ocean and the Pacific Ocean also places it on the crude oil transport routes between the production countries in the Middle East and the important consumption countries such as China, Japan and South Korea. Therefore, the western seashore (Andaman) has high potential for being the new economic route between the production base and the major energy consumers.



Source: AMP Consultants Ltd.

Figure 2-1 New Trade Lane and Economic Benefit for Thailand

2.2 Transport Network Linkage on the New Trade Lane between Thailand and the Sub-regional Trading Routes

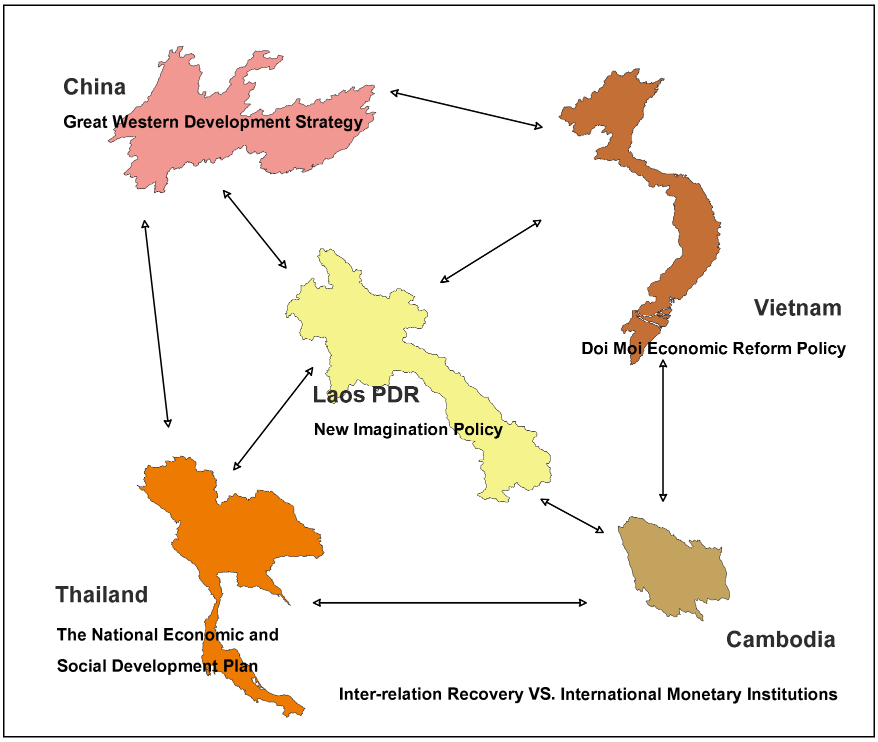
The expansion of trade markets and investment under the economic linkage within the GMS member countries creates new opportunities in trade for Thailand. GMS is the cooperation of regional development among 6 member countries comprising Thailand, China, Laos, Myanmar, Vietnam, and Cambodia. The cooperation framework was established in 1992 and is similar to the ASEAN framework. The agreement has progressed much further in transforming agreements into actions than for any other agreements that Thailand has made with other countries.

Under the GMS, road transport linkage is one factor creating the practical regional economic development and linkage among member countries, including enhancing of competitive capability of the member countries in the current globalization. The road transport network linkage is derived from the Transport Master Plan of 1995. The Master Plan defined the international transport linkage across the borders on each route according to the potential of economic growth of the member countries. Since 1998, the Master Plan has paid attention to the economic corridor concept. This concept emphasizes the investment in basic infrastructure such as linkage for roads, energy, telecommunications and tourism, especially transport with the same geographical area in order to create positive effects for the highest benefit. The economic corridors that have been defined are the North-South, the East-West, and the Southern Corridors as shown in Figure 2-2.

Source: ADB, GMS Transport Strategy 2006-2015

Figure 2-2 Main Economic Corridors under the GMS Agreements

The new potential trade lanes under the GMS for Thailand are related to the growth of markets for producers and consumers in Southern China, Laos, Vietnam, and Cambodia. The major force for the establishment of the GMS Agreements is the transformation of economic activities from the Central Economy System to the Market Economy System within the four countries. Exchanges of trades in the free market economic system have created the economic linkages between Thailand and the four countries from the early 1970s (Figure 2-3).



Source: AMP Consultants Ltd.

Figure 2-3 International Economic Linkages

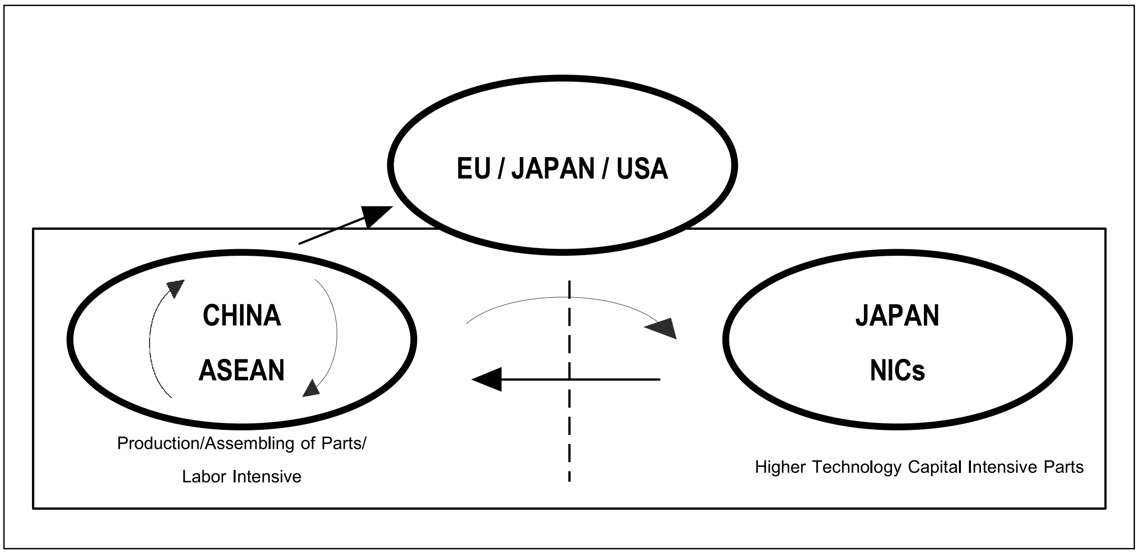
Changes in the economic system of the four countries have shown the new market potentials for Thailand in two groups. **The first group** consists of Laos, Vietnam, and Cambodia, that had been under the influence of the Soviet Union. **The second group** is the Southern China that has been starting the regional economic development after the Central Government of China has announced the under the Great Western Development Strategy.

1) Potentiality from Economic Transformation of Laos, Cambodia, and Vietnam

Three of the countries, with the exception of Thailand, have changed their economic system from the Central Economy System to the Market Economy System during the past two decades while the majority of the population of about 75 per cent are living in the rural areas and earn their living on subsistence agriculture. The development of these countries to modernization, especially for Laos and Cambodia, still faces problems with a social structure that cannot sustain the economic growth within short period.

In the first half of the nineteenth century, the economic, social, and political characteristics of these countries were similar since they had been colonized by France taking the development of the countries in the same direction. From the second half of the nineteenth century, the economic, social, and political situations of these countries have gradually moved apart as a result of outside factors derived from the different levels of influence of western countries. These factors have significant effects upon the administration and the extent to which the government has intervened in the lives of the people in each country that have affected the economic development of each country.

The extension of influence to the Region by the super power countries as the Soviet Union, China, and the United States of America during 1960-1970 has made Indochina an area of military conflict and division of border problems. In this period, Vietnam and Laos still used the Central Economy System modeled on the Soviet Union while Cambodia was under the rule of the Khmer Rouge supported by China. The administration in Cambodia was so strict that the business activities and marketing were completely destroyed. Such operation kept Cambodia separated from the neighboring countries and the economic activities could not be linked. In 1979, Vietnam occupied Cambodia. At that time, there was a clear difference compared to Thailand. While Laos, Cambodia, and Vietnam were supported from the Soviet Union, Thailand had progressed economically to become a country in the New Industrial Countries (NICs) while other countries in the Indochina were categorized in the group of the poorest country of the world. (Figure 2-4)



Source: AMP Consultants Ltd.

Figure 2-4 Structure of Work Sharing in Eastern Asia

After the decline of influence of the Soviet Union by the end of 1980, and the withdrawal of Vietnamese military from Cambodia in 1989, a new era of economic and social development has emerged in this Region. The countries that had close relationships with the Soviet Union such as Laos, Cambodia, and Vietnam started to find their own development strategies. Economic development started to change to that of the market system following the model from neighboring countries, especially Thailand, with each country applying the model in its own way. In the 1970s, Laos, Cambodia, and Vietnam announced their intention to become members of the ASEAN. Vietnam was the first country from Indochina Region to become the member of the ASEAN in 1995. Laos became the member of ASEAN in 1997, and Cambodia in 1999. After joining the ASEAN and after China adopted its own system of economic development, the countries of the Indochina Region have become a group of countries with high economic growth after the long period of stagnation under the Central Economy System.

Table 2-2 Growth Rate of Gross Domestic Products during 2003-2007

Unit: Per Cent

Country	2003	2004	2005	2006	2007
Laos	6.1	6.4	7.1	7.6	7.1
Cambodia	5.2	6.0	6.0	6.3	6.5
Vietnam	7.3	7.8	8.4	8.2	8.5
Thailland	7.1	6.2	4.5	5.1	4.8

Source: www.imf.org, IMF/World Economic Outlook, April 2008

The three countries changed their economic development planning from the Central Economy System to the Market Economy System. ***Vietnam has reformed the economic system by the announcement of the Doi Moi policy*** in 1989. ***Laos announced the economic reform according to the New Imagination Policy*** in 1993. ***Cambodia started its policy on the reconstructed relationship with international financial Institute*** in 1993. Linkage of economic and social infrastructure of the three countries resulted in changes in their economies supporting higher economic growth (Table 2-2). The basic economic and social infrastructures of these three countries has resulted in increasing of economic growth and a better standard of living for their citizens since the 1990s. Statistics show that the people have a better living standard after the changes that occurred early in the 12 years between 1992-2004, and the expansion of trade, investment, and economic growth led to a higher average income per head of the people especially before the economic crisis in 1997. Countries with economic growth during that time were Thailand and Vietnam. Although the poverty problem has decreased in Laos, Cambodia, and Vietnam so that their people are better off economically, poverty is still a serious problem in the region. (Table 2-3)

Table 2-3 Poverty Index and Income Distribution for Indochina Countries

Country	GDP Per Head (USD)		Per Cent of Poverty below Poverty Line of Country	
	1992	2004	1992/93	Lastest Figure[a]
Cambodia	220	348	39.0[b]	35.9
Laos	271	402	46.0	32.7
Thailand	1,945	2,544	23.2	9.8
Vietnam	144	500	58.1	24.1

Note: a = Cambodia (1999) Laos (2002) Thailand (2002) Vietnam (2004)

b = 1994

Source: Asian Development Bank; Regional Cooperation Strategy 2006-2008, p.83

The change of policy in favor of building up economic infrastructure linkages with world society has a better socio-economic trend in the economic and social indices of the three countries. Data in Table 2-3 shows that Vietnam had on average the best status among the three countries since Vietnam had been actively reformed in the decade of 1990s and the human resource of Vietnam was greater than the other two countries. The reform of land and agricultural markets in Vietnam resulted in rapid growth of rice production during 1988-1995, but the similar reform has not happened in Laos and Cambodia so that people in the two countries are still poor and the human resource is still unskilled.

Table 2-4 Basic Economic and Social Indices of the Countries Studied, 2005

Country	Area (1,000 Sq.km.)	Population (Million)	GDP Per Head (USD)	Export (Mill.USD.)	Import (Mill.USD.)	Trading Growth (Per Cent)
Laos	237	5,758	423	510	745	10
Cambodia	181	13,589	358	3,100	3,700	17
Vietnam	394	44,150	554	31,625	36,476	21
Thailand	513	64,470	2,537	110,110	118,191	16

Source: The World Bank 2006; World Development Indicators 2006 Database (online) www.worldbank.org

2) Economic and Trading Potentiality of Southern China

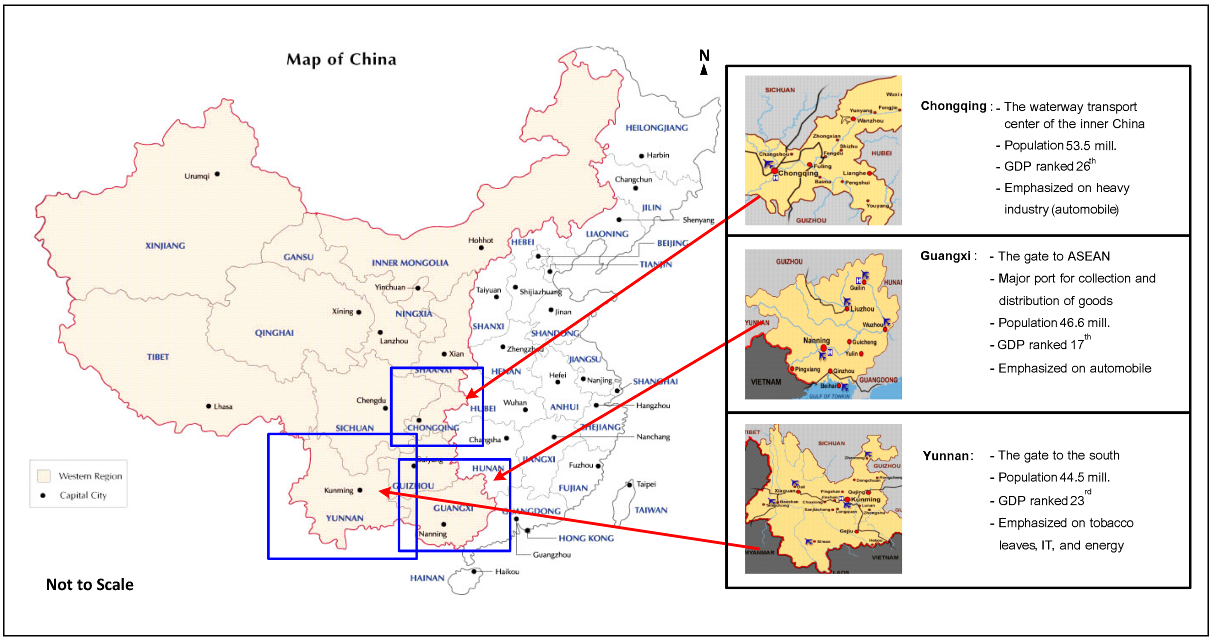
The Chinese Central Government announced the Great Western Development Strategy starting from January 2000. The target areas are 12 regions away from the coast consisting of 6 regions of Gansu, Qinghai, Shaanxi, Sichuan, GuiZhou, Yunnan; 5 self governed territories of Xinjiang, Ningxia, Xizang, Quangsi, Inner Mongolia; and 1 Metropolis Chongqing (Figure 2-4). The overall economy of the 12 regions was shown in Table 2-5 as data of the 12 regions comparing with the whole country.

Table 2-5 Important Economic Indices of 12 Western Regions Comparing with National Indices, 2005

Economic Indices	Unit	China	12 Western Regions	Per Cent of Country
Area	(Million Sq.km.)	9.60	6.86	71.5
Population	(Million)	1,307.56	359.76	27.5
GDP	(Billion Baht)	89,728.03	16,414.73	18.3
Average Income per Year	(Baht)	68,808.64	45,764.60	-
Industry				
- Coal	(Hundred Million Tons)	22	8	36.6
- Crude Oil	(10,000 Tons)	18,135	4,502	24.8
- Electricity	(Hundred Milliom kwh.)	25,003	6,104	24.4
- Iron	(10,000 Tons)	35,324	4,555	12.9
Investment on Fixed Assets	(Billion Baht)	43,507.05	8,647.64	19.9
Retail Trade	(Billion Baht)	32,922.58	5,675.49	17.2
International Trade	(Hundread Million USD)	57,189.36	1,815.13	3.2
- Export	(Hundread Million USD)	30,645.71	1,036.07	3.4
- Import	(Hundread Million USD)	26,543.65	779.06	2.9
Transport				
- Length of Existing Railway	(kilometre)	75,437	27,594	36.6
- Highway	(kilometre)	1,930,543	780,339	40.4
- Expressway	(kilometre)	41,005	10,530	25.7

Source: China Statistical Yearbook 2006, Table 2-6, Page 40-43

Of the mentioned 12 regions, only 3 regions (Figure 2-5) were considered to have the economic potential to induce trade and investment along the transport network on the North-South Corridor between South China – Northern Laos – Upper North of Thailand. The three regions are Yunnan, Chongqing, and Quangsi. Table 2-6 shows the comparative Data of the 3 regions of China and Thailand.



Source: Modified from www.china.org.cn

Figure 2-5 Republic of China and 3 Western China

Table 2-6 Economic Indices of 3 Western Regions Categorized According to GDP, 2005

Thailand/ South China	GDP (Trillion Baht)	Average Income/Year (Thousand Baht)	Population (Million)	Total Trade (Trillion Baht)	Export (Trillion Baht)	Import (Trillion Baht)	Actual FDI (Billion Baht)	Retail Trade (Trillion Baht)
Thailand	7.0	109.4	64.2	10.6	5.2	5.3	181.0	-
China	88.5	70.0	1,300	57.2	30.7	26.6	3,181.4	32.9
Yunnan	1.7 (23rd in China)	38.1	44.5	0.2	0.1	0.1	7.6	0.5
Guangxi	2.0 (17th in China)	42.8	46.6	0.2	0.1	0.1	15.2	0.7
Chongqing	1.5 (26th in China)	53.5	28	0.2	0.1	0.1	20.1	0.6

Source: China Statistical Yearbook 2006 and Information Technology and Communication Center with cooperation from the Department of Customs

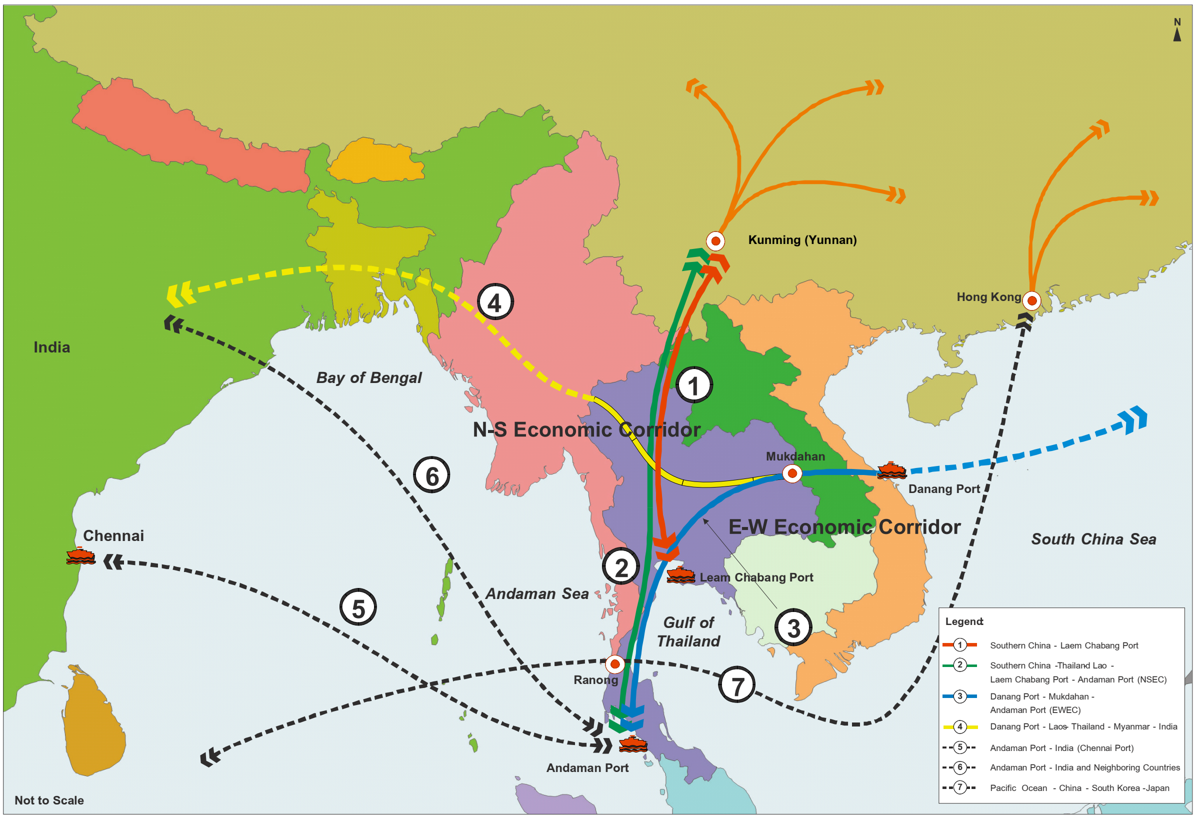
These three regions of China have ample resources and having experienced increased economic growth every year. Continuous inflows of foreign investment have increased the potential of these 3 regions to play an important part in economic development in the future.

2.3 New Trade Lane

What has been presented in relation to targets, conditions, and strategic issues has been used as the guidelines for study leading to the conclusion as the new trade lanes place Thailand as the transport and business hub of the Region consisting of:

1) Freight Transport Routes and International Trade

The freight transport routes and international trading routes especially between China and India and the major markets of the world passing through Thailand can save transport cost and time for both countries. The study defined the new freight transport as followed (Figure 2-6).



Source: AMP Consultants Ltd.

Figure 2-6 New Trade Lane

(1) Routes linking Southern China to Northern Thailand by land passing Laos to Laem Chabang Port and coastal harbors on the Andaman Sea by the North-South Economic Corridor (N-S Economic Corridor No.1 and 2).

(2) Routes linking from Danang Port passing Laos to Mukdahan and to deep sea ports on the Andaman coast (No.3) on the East-West Economic Corridor (E-W Economic Corridor). The routes in (1) and (2) provide links from Southern China and countries in the Pacific Group to the Middle East and Europe. The study assumed that there will be saving on cost and time through the linkage on the corridors that the freight transport can bypass the Melaka Chamber through the southern Thailand.

(3) Routes linking from Danang Port passing Laos from the Northeastern to Northwestern parts of the country to Myanmar to India (No.4). This route will link India to the countries in the Pacific Group. The study assumed that the trade will be more efficient due to saving in cost and time since the freight transport can bypass the Melaka Chamber.

(4) Routes linking by sea between the ports on the Thai Andaman coast and India and neighboring countries (No.5 and 6). The study assumed that Thailand can increase the efficiency of trade with countries in those groups since the freight transport can bypass Laem Chabang Port and the Melaka Chamber.

(5) Routes linking energy sources (crude oil) with the industrial countries on the Pacific coast as China, South Korea, and Japan, through the coastal seaboard of the Southern Thailand (No.7).

2) Transport Routes for Freight and Travelers

Thailand has Suvarnabhumi Airport as the open gateway linking the Indochina Region to world markets. Suvarnabhumi Airport provides Thailand with a comparative advantage on aviation flights linking the Indochina Region with other regions of the world, compared to other airports in this Region as Changi Airport in Singapore. Consideration of corridors for trade, investment, and linkage of transport for travelers and air cargoes, emphasis will be on travel and transport from Suvarnabhumi Airport and potential new services that can be linked with the GMS, China, and India in three routes as:

(1) **Airways:** The development of Suvarnabhumi Airport and the reuse of Don Muang Airport are the main routes of Bangkok as being the traveling center of the Region and the Airport is the hub of Asia.

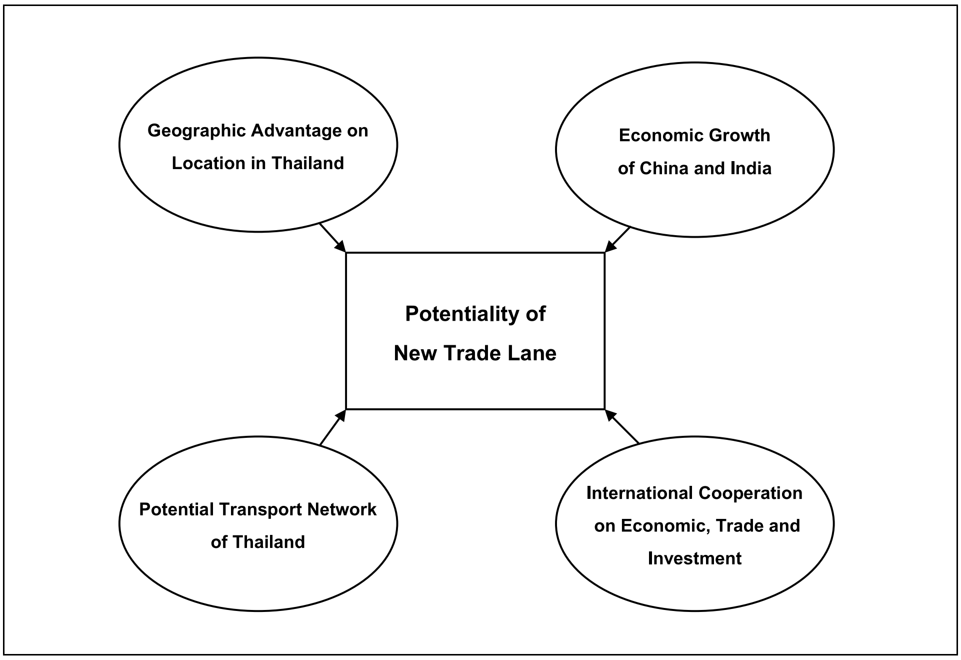
(2) **Waterways:** Water transport along the Mekong River from China to Chiengrai (Chiengsaen) and Chiengkhong to Laos heading to Luang Prabang should be the new route for future tourism having Chiengsaen Port as the hub.

(3) **New Roads:** The new roads are the East-West corridor from the center of Danang to Mukdahan to Indochina Intersection at Phitsanuloke and going to Myanmar at Mae Sot. The traffic volume is still low on the route and, currently, there are some problems, politically, on the way passing Myanmar.

3) Potentiality of the New Trade Lanes

The main factors that were considered in this study defining the recommended potential new trade lanes having Thailand as the transport center of the Region providing economic benefits to the country are (Figure 2-7):

(1) Southern China and India are the countries with high economic growth and expansion. The geographical location of Thailand is of comparative advantage in terms of cost saving in freight transport on the recommended routes for the international trade of the two countries and the world markets providing freight transport through Thailand, or through cooperation in trade and investment. The two countries have substantial populations and high purchasing power. Thailand will be benefit through trade and investment providing linkage with the two countries in the future.



Source: AMP Consultants Ltd.

Figure 2-7 Potentiality of New Trade Lanes

(2) Political changes in the world especially the decline of the Soviet Union (Russia) led to expansion of international trade. The competition is tougher while agreements by trading and investing groups in the same regions increased. The conceptual framework for cooperation in economy, trade and investment of Thailand and the neighboring countries, therefore, emphasizes the development of common markets. The driving forces from international development bodies such as the UNESCAP and the ADB have resulted in the development of countries in the same region and the development of common markets modeled on the European Union (E.U.). The main concept is to encourage economic development among the concerned countries.

(3) Development of road network and rail network on the potential economic, trade, and investment routes of Thailand.

(4) Geographical comparative advantage of location on the Southern coast of Thailand will enable transport linkage with saving on cost and time between the crude oil sources and the industrial countries consumers.

(5) Thailand has efficient domestic transport networks and can increase the efficiency in transport linkage to support the expansion if economic, trade, and investment corridor.

3. Development Strategy

The strategy for the development of potential transport network to support the expansion of economic, trade, and investment corridor consists of two major parts as (1) the strategic plan directly within the responsibility of the Ministry of Transport as the development of basic infrastructure of transport and the logistics system (the management system) and (2) the strategic plan under the responsibility of other organizations for economic development that induce demand in the markets of goods and services, that will link to area economic development and linkage to foreign countries with potentiality on economy, trade, and investment.

3.1 The Role of the Ministry of Transport in the Development of Infrastructure

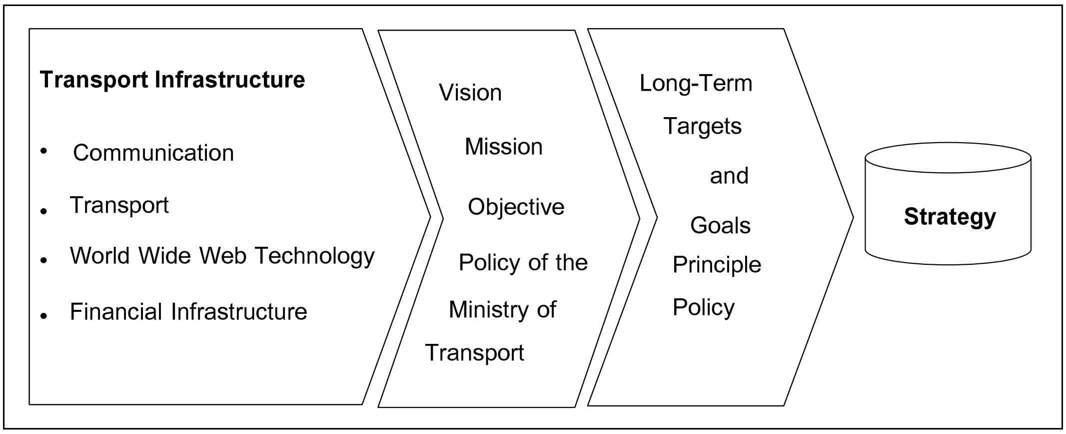
The development of the potential transport network of the country to support the expansion of trade and investment corridors must be coincide with the evolution of the economic, trade, and investment system of the changing world, or the development of the basic transport network must relate with the rapid changes in format of economic and trading business, in order to suit with the severe competition in the world today.

Changes in trading format and business organizations result from the change in infrastructure and technology. The most important change is mass-production technology. Mass-production technology lowers the cost of production compared to old technology. To benefit from the opportunity, the government must support business organizations to ensure the supply of production on time. Bringing goods in to the factory to supply production and meeting the demand for moving goods to the markets requires efficient infrastructure for transport, communication, and financial services. The past development of infrastructure according to the National Economic and Social Development Plan shows the role of basic infrastructure in the promotion of development and economic growth of the country.

However, from the beginning of the nineteenth century and especially in the last three decades, changes in business have been clearly seen and difficult to predict. The businesses have been more complex. Globalization creates opportunities and obstacles to business organizations and countries. The use of computers is the major reason helping business organizations to specialize and compete with large scale organizations with high investment. In the modern business environment with severe competition, big businesses that used to have influences upon the markets have to build up their own network of alliances, merging or taking acquisition with others in order to compete and reduce cost in accordance with changes in business situations.

The role of the Ministry of Transport in defining the strategy for the development of infrastructure has to be adapted to suit the situation changes in business trading. The infrastructure includes communication, transport, and computer technology of the world wide website, and the financial infrastructure relating to financial activities. The infrastructure that has been linked and depended on each other of markets in various regions of the world is the results of automobiles and airplanes creating changes in transport sector.

Communication creates new trade activities. Free financial movement enables easy mobilization of capital while computer technology and internet create changes in trade strategy (Figure 3-1).



Source: AMP Consultants Ltd.

Figure 3-1 Transport and Strategy for Development of Infrastructure

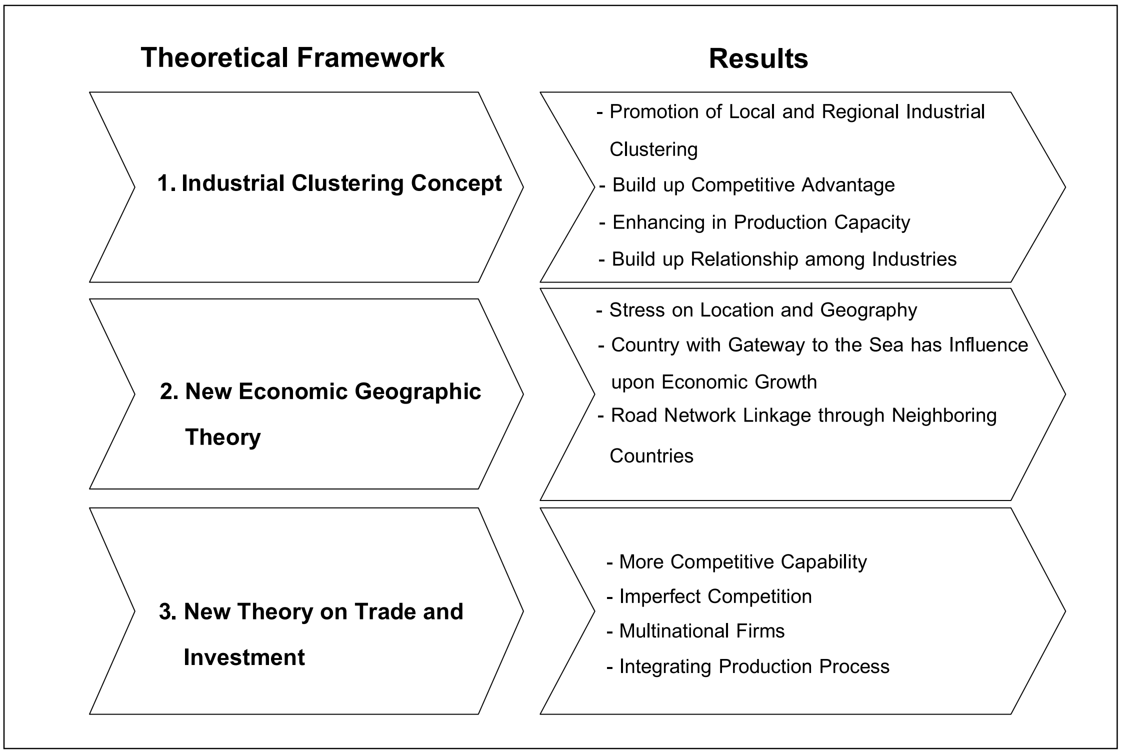
The role of the government in the development of economic infrastructure has started to be more complex, especially in the developed countries, in order to strengthen modernization to the infrastructure in every aspect. Therefore, we can say that delay in investing in infrastructure results in delay in national economic development. The infrastructure in the world today is not only the efficient transport but also other forms of infrastructure such as hi-speed internet and efficient financial institution systems. All forms of infrastructure must be coordinated to deliver economic development.

3.2 Theoretical Framework for Analysis

Strategic planning for the development of potential transport network linkage to support the extension of economic, trade, and investment corridor must study and analyze the development of the network to suit the changes in economy, trade, and investment. This study project has studied and analyzed all the relevant factors in economic development and consideration has been given to national targets in decentralization of growth and linking of economic activities to neighboring countries and potential markets in other regions including linking of efficient transport network, in so doing, the Consultant used the theory and theoretical framework in analysis for strategic planning as follows: (Figure 3-2)

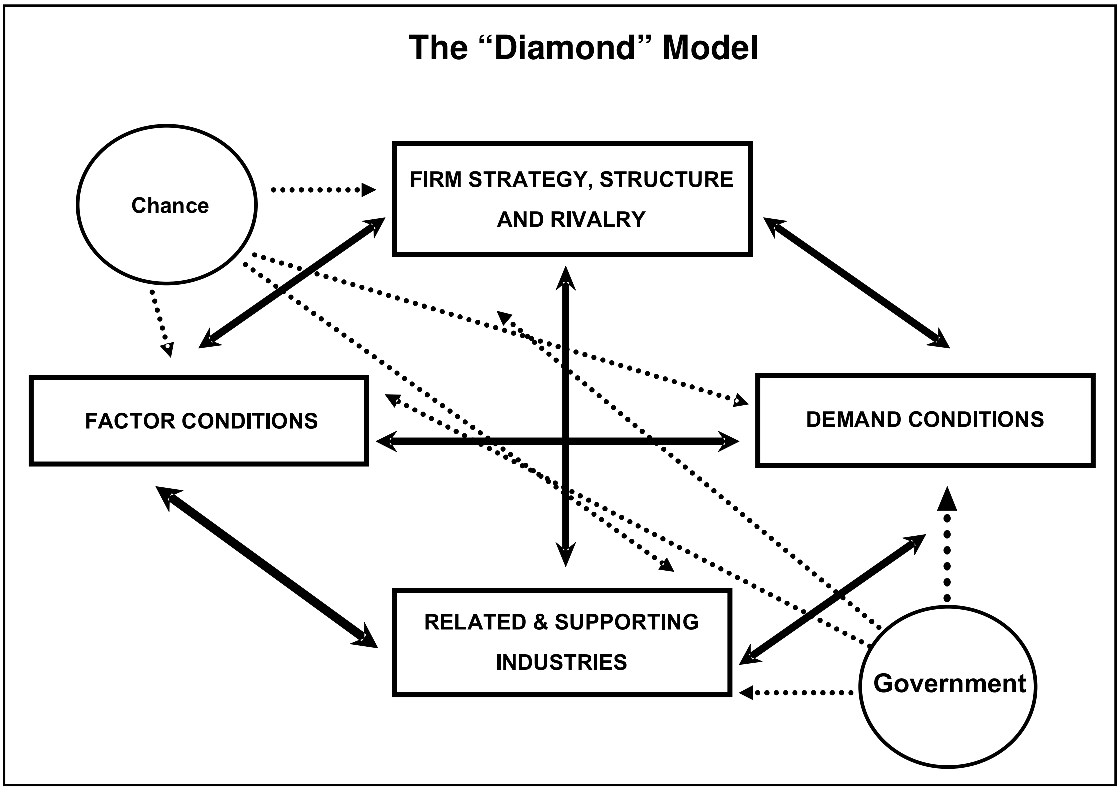
1) Industrial Clustering Concept

The Industry Cluster Model has been more used in economic development of various countries. This model is used for defining and supporting industrial grouping within the potential locality and region for obtaining advantages in enhancing competitive capability. The industrial clustering policy shows important differences from traditional economic planning that stresses the direct development of business firms while the industrial clustering places emphasis on both direct and indirect relationship among industries (Figure 3-3).



Source: AMP Consultants Ltd.

Figure 3-2 Theoretical Framework for Analysis



Source: Modified from "Porter's Diamond Model": Diamond Model and Cluster (Michael Porters).

Figure 3-3 The Diamond Model

2) Theoretical Concept on New Economic Geography

This theory has been used in studying the growth of the country since the 1990s. This theory emphasizes the important role of the geographical location of the country in explaining the format of trade and economic development of the country. For example, gateways to the sea and the distance from the major markets of the country show a substantial effect on the international trade of the country. Such factors influence the economic success of the developing country in achieving the target of exports of industrial goods to world markets and eventually delivering economic growth. In the case of Indochina landlocked countries as Laos and Southern China where the people are poor, the construction of road networks passing through neighboring territories to the sea and reductions in legal discrimination, linkages for freight transport from the landlocked areas to the sea has brought about economic growth in these landlocked areas.

3) Theoretical Concept on Trade and Investment in New Trade Lane

This theory can be used to explain how a business can build up competitive capability over rivals or how one business has influence that resulted in imperfect competition in trade. In the situation of international business, it is often found that multinational firms can create competitive advantages over their rivals by the Integrating Production Process. They are able to reduce the cost of production by making use of choice between the different Production Processes in different countries. This enables the business to create value added to own business in various countries. By so doing, the said business can create value added of its own much more than the competitor since it has power to monopolize the source of production factors, or having much more business capability and technology than the competitors.

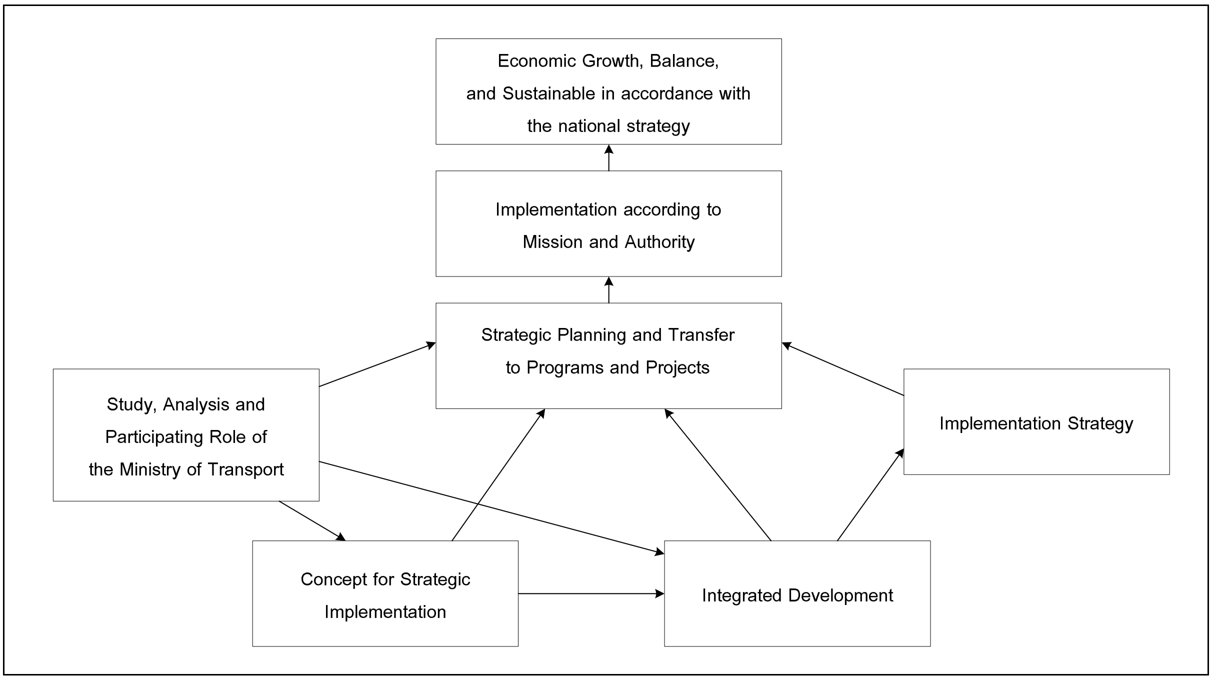
3.3 The Target of Strategic Planning

The objective of this study is the strategic planning according to the duty and mission of the Ministry of Transport (Figure 3-4) on the status of one economic Ministry of the Government Sector. The strategic planning must be compatible with the national target of development set by the Office of the National Economic and Social Development Board (NESDB). The NESDB has set the guidelines for the national economic development according to the vision of Thailand to the year 2027 as follows:

(1) The economic structure that rely more on its own system, having securities on food and energy by:

- The scale of economy having Gross National Products (GNP) more than Gross Domestic Products (GDP),
- Being the production base of production for agricultural commodities, industries and services, trade and investment.

(2) Thailand is the economic center of the Region and being the development partner with the neighboring countries.



Source: AMP Consultants Ltd.

Figure 3-4 Transformation of Policy to Practices under the Ministry of Transport Mission

1) Conditions for Strategic Planning

Internal and external important changes having effects on the economic development of Thailand were considered in strategic planning as (Table 3-1):

(1) Strength and Opportunities

- Globalization creates economic grouping in all levels from world level, regional level, and sub-regional level. The economic group that Thailand is closely involved at regional and sub-regional levels (especially GMS) making linkage of infrastructure network, energy sources, telecommunication, and investment and trade cooperation, enable Thailand to benefit from the geographic location making more opportunities for national economic development.
- The center for world economic power has moved into Asia where China and India have started the role of new world economic super power.
- Rapid technology development in the world has created opportunities to develop the production process and society of learning through information networks and these networks will be an important tool for the development of the competitive capacity of the country.

(2) Weakness and Threats

- Urbanization expansion is diminishing thus affecting the economic inequalities and conflicts in the allocation of resources between urban and rural.

- Thai society has gradually entering the old people society that affected the productivity of Labor that has to be imported.

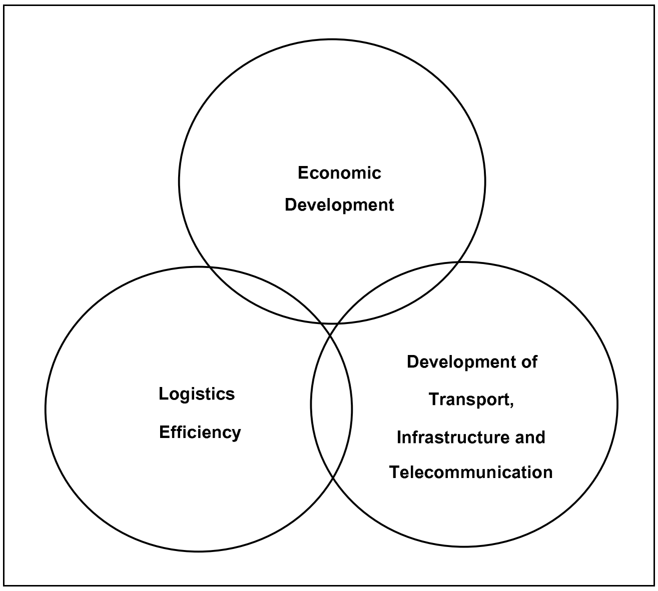
Table 3-1 SWOT and Thai Economic Development

Strength	Weakness	Opportunity	Treats
• Comparative Advantage of Location • Good Transport Network Linkage • Technology Development • Development and Enhancing of National Competitive Capability	• Lack of organization for coordination to bring about real practices	• Grouping of ASEAN, GMS, BIMSTEC as a single market • China and India have important roles in the world economic • Use Laos as production base and contract farming	• Economic disparities • Conflicts on usage of resource between Urban and rural areas • Old ages society • Import of foreign labor

Source: AMP Consultants Ltd.

2) Strategic Issues

Strategy for development of potentiality to accommodate the expansion of economic, trade, and investment must be based on guidelines of **demand derives supply**. Therefore, strategic planning must be linked to national economic development and efficient infrastructure together with the development of infrastructure and efficient logistics. The major strategic issues to be considered consist of (Figure 3-5):



Source: AMP Consultants Ltd.

Figure 3-5 The Development of Strategy Planning

(1) To use the infrastructure to support the economic development strategy, consideration must be given to the important issues supporting the national strategic planning as:

- Supporting of production linking the agricultural, industrial, and servicing sectors in order to establish the creation of value added through the production chain and clustering by:
    - Accelerate the improvement of productivity by the creation of value added in the production sector basing on knowledge, technology, and innovation.
    - Support investment domestically and internationally: Domestic investment emphasizes the large scale upstream industries that can create other continuative industries and industrial business. Emphasis is also given to the investment infrastructure and facilities. Foreign investments are for supporting of business with potentiality in business with potentiality to compete with other countries.
    - Prepare the areas with potentiality to accommodate the expansion of industry, trade, and investment.
- Support Thailand to have leading economic roles in the Sub-region in mutual economic and social development.
- Support the economic areas of Thailand to be developed to be the base for enhancing the economic competitive capability of the country, for sustainable ecology, and for social happiness. The development of new economic areas is emphasized on promotion of local economy that strengthens the national competitive capability such as the new economic areas of the Southern seacoast, and the bordering economic areas.

(2) Strategic planning of efficient system of logistics reducing cost on trade, production, and investment on the new trade lane.

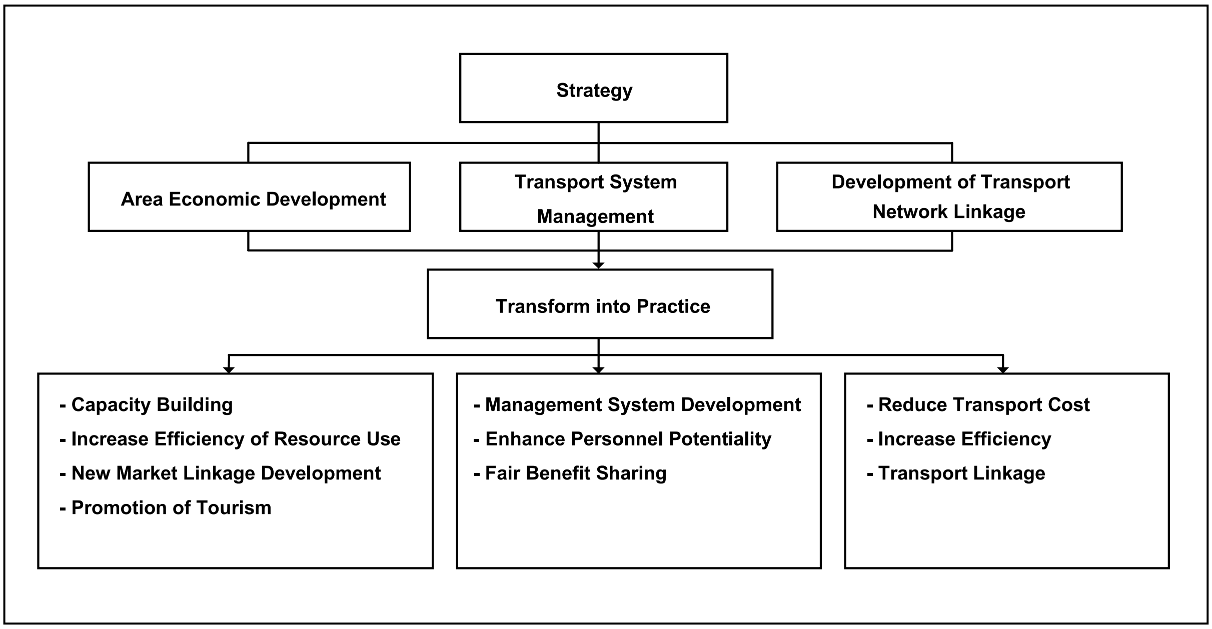
(3) Develop strategic planning for efficient transport infrastructure network and telecommunication, in response to the strengthening of restructuring in production and service sectors for competition. The development will be for the regional, domestic, intra sub-regional and interregional linkages, to accommodate the expansion of the economic, trade, and investment of Thailand.

3) Development Strategy

The study defined three development strategies to accommodate the potential expansion of economic, trade, and investment route consisting of:

- Area economic development strategy
- Transport system management strategy
- Development of Transport Network Linkage Strategy

These three strategies can be transformed into practical implementation as shown in Figure 3-6:



Source: AMP Consultants Ltd.

Figure 3-6 Strategy and Transform into Practice

3.4 Area Economic Development Strategy

The economic policy of Thailand that emphasized solving the problem of the economic gap between urban and rural sectors started in the Third National Economic and Social Development Plan. The main policy in the Plan consisted of two strategies, decentralization of industries to regions, and development of growth centers in each region. The supporting measure was the Investment Promotion Regulation of 1977, issued by the Board of Investment, to attract foreign investors and to support the decentralization of industries to the regions. In 1987, there was the amendment of the Regulation to divide the industrial areas in three types and to set the tax incentives to reduce the tax in higher ratio in the remote areas away from Bangkok as the return benefit for those who invested in such areas.

The concept of **Regional Growth Center**, has been announced since the period of the Fourth National Economic and Social Development Plan. The major policy was set in the Eastern Seaboard Development Plan during the Fifth National Economic and Social Development Plan in order to accommodate the industrial growth in the replacing area of Bangkok that links to the Northeastern Region. The results of the policy were shown by the increased number of factories applied for investment promotion since 1982, especially in the area of the Northeastern Region such as Nakhon Rachasima with the second highest industrial growth to Bangkok, and the establishment of the Suranaree Industrial Estate in 1889. However, the weak point of the policy can still be seen since the support was given only for investment to the factories while investment on infrastructure to support the growth was lacked and the coordination among concerned organizations was not integrated and clear in practice.

The policy for Thailand to become the economic center in the Region came from the driving force after 2002 with the expansion of international trade in the Indochina Region. The Seventh National Economic and Social Development Plan contained the policy on bordering trade especially the promotion of new economic areas in the Northern and Northeastern Region of the country, for example, in Chiengrai, Tak, Nongkhai, Mukdahan, and Ubon Rajthani provinces. The Eighth National Economic and Social Development Plan referred to the opportunity in the progress industrial development that the bordering special economic areas and the free tax areas should be established to promote the trade and investment within Thailand and within the neighboring countries.

The Ninth National Economic and Social Development Plan referred to the use of area potentiality in each region to balance the growth of economic development and to strengthen the economic relationship that creates common wealth among the regions of the countries. The Plan also emphasized the importance of building up the competitive capability of each region leading to the expansion of market, negotiation power in trade, investment, and economic cooperation. The areas in the Northern were Chiengmai, Chiengrai, Lampun, and Lampang should be developed for close relationship with the countries in the GMS. Nongkhai, Mukdahan, and Nakhon Phanom, should be promoted to become the gateways to Indochina having Ubon Rajthani as the regional center. Nakhon Rachasima and Khon Kaen are the centers linking to the North and the Eastern Seaboard respectively. Songkhla, Surat Thani, Krabi, and Satun, in the Southern Region, should be promoted to be the Hub for petroleum and chemical products as well as being the trading gate for the Southern China. Moreover, the bordering provinces along the East-West Economic Corridor (EWEC) and the North-South Economic Corridor (NSEC) should be developed to become the gateways to the countries under the GMS.

Therefore, the conceptual framework in the strategic planning for the area economic development leading to the implementation of the Ministry of Transport that coincides with the concerned organizations, in accordance with the mission of the Ministry of Transport in the promotion of expansion of economic, trade, and investment activities on the potential routes, must depend on the major condition on coinciding with the economic development strategy of the Office of the National Economic and Social Development Board (NESDB) submitted to the Cabinet in April, 2008.

The main principle in regional economic development submitted to the cabinet was the establishment of the linkage of area economic development in accordance with the guideline of national development according to the National Policy, the government policy, the National Administration Plan B.E. 2551-2554, the Tenth National Economic and Social Development Plan, and the context of changes in the country and outside the country in order to create the development opportunity for all the regions of the country coinciding with the potentiality and socio-geographic area by:

(1) Define the format of area economic development of the country and regions including community systems and infrastructure networks for the distribution of economic activities and transfer the growth to the regions to balance the development, and

(2) Set up the role and development strategy for the region according to the potentiality and opportunity of the area in order to enhance the capability on economic competition creating investment for job and income creation for people together with human development and enhancing of quality of life, management of sustainable environmental resources, national security, and good management, for the benefit of the people and sustainable development.

The framework of the area economic development emphasizes the increasing quantity and value of goods or tourists in the potential areas of the region that leads to the flow on economic, trade, and investment potentiality for the new trade lane. The area economic strategic development, therefore, is base on:

(1) ***Development of Strength*** from the comparative advantage of location and the use of production base from the local resources.

(2) ***Elimination of Weakness*** by strengthening the capability development of the operator and the development of cooperation network between the government and the private sector, or among private sector companies.

(3) ***Seeking for Opportunity*** from the expansion of markets under the various Agreements

(4) ***Reduction of Threats*** from the difference on fundamental ideal of the government of Thailand and the neighboring countries.

The area economic development strategy, therefore, starts from the definition of suitable areas for linkage of economic activities among countries and the economic transfer among the regions of the country. Under this foundation, the transformation of strategy into practices and the development of human resources to enhance the competitive capability will be possible. The strategic development along this guideline will lead to the creation of increased volume and value added to the goods and tourism that are economic beneficial to the area.

1) Formats of Area Economic Strategic Planning

The formats for the creation of projects developed from the strategy under the mentioned concept into practice can be described into three types as follows:

(1) Economic Balancing System to reduce the differences of development levels among the regions.

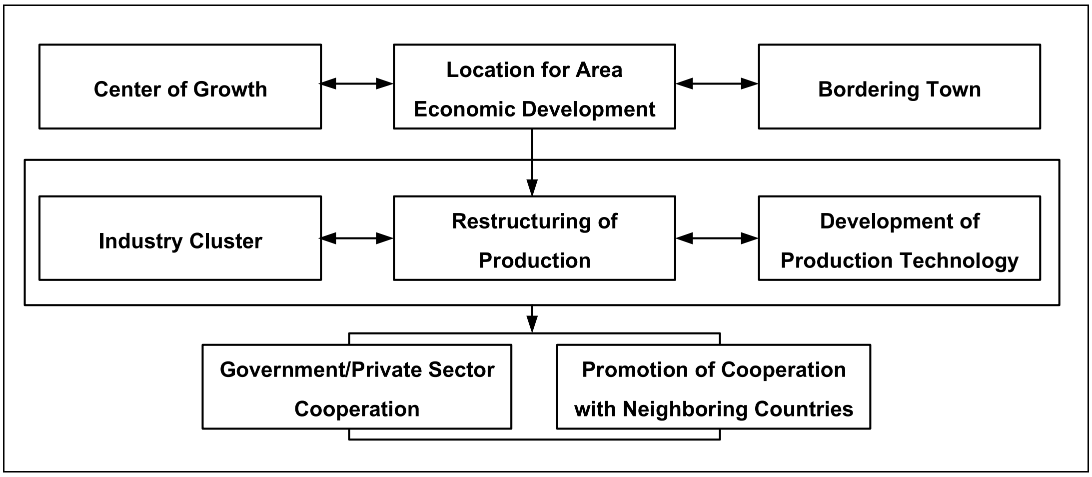
(2) The Convergence Process that creates domestic economic linkages, and international economic linkages among countries with shared borders.

(3) The creation of inter-regional cooperation will therefore lead to economic and social reforms for more efficient and competitive marketing system.

2) Transformation of Area Economic Strategic Planning into Implementation

Changes in globalization create more economic linkage in various parts of the world. Thailand has to enhance its competitive capability and use its comparative economic advantage of location and resource based strategy for economic development taking advantage of the opportunity of economic linkage of countries under the GMS Agreements, the ACMECS, the IMT-GT, and the BIMSTEC.

The area economic development strategy to strengthen the success of development of potential transport networks established the strategy for area economic development in each region of the country linking to the transport routes of neighboring countries to form the development base for industry, agriculture and agro-processing, and tourism of the regions (Figure 3-7).



Source: AMP Consultants Ltd.

Figure 3-7 Area Economic Development Strategy

Guidelines must be set up for implementation for transforming the strategy into practice according to the mentioned conceptual frame work and development formats in every region as follows:

(1) Locate the area to be developed as the growth center and the bordering town to accommodate the economic, trade, and investment linkage on the potential route.

(2) Restructure the industrial production, agro-industrial processing, and regional tourism into the international standard.

(3) Develop technology for production and service sectors through research and development.

(4) Develop regional cooperation network in the government and in the private sectors to promote and facilitate trade and investment in the area.

(5) Support the economic cooperation with neighboring countries through development of facilities in international trade.

Area economic development leading to the targets in each region will be done according to the following strategies.

(1) Resource based Strategy or the Strategy to achieve efficiency in foreign investment. Creation of sustainable resource use network, and linkage between industries and business.

(2) Human Resource based Strategy to keep peace in the community and working areas of the people in the regions including enhancing of personnel capability of local people, and setting up of conditions for employing of alien labor to prevent social effects and mobility of alien labor.

(3) Attract foreign investment, especially from China and Japan, in order to expand the markets, goods flow, and promotion of tourism.

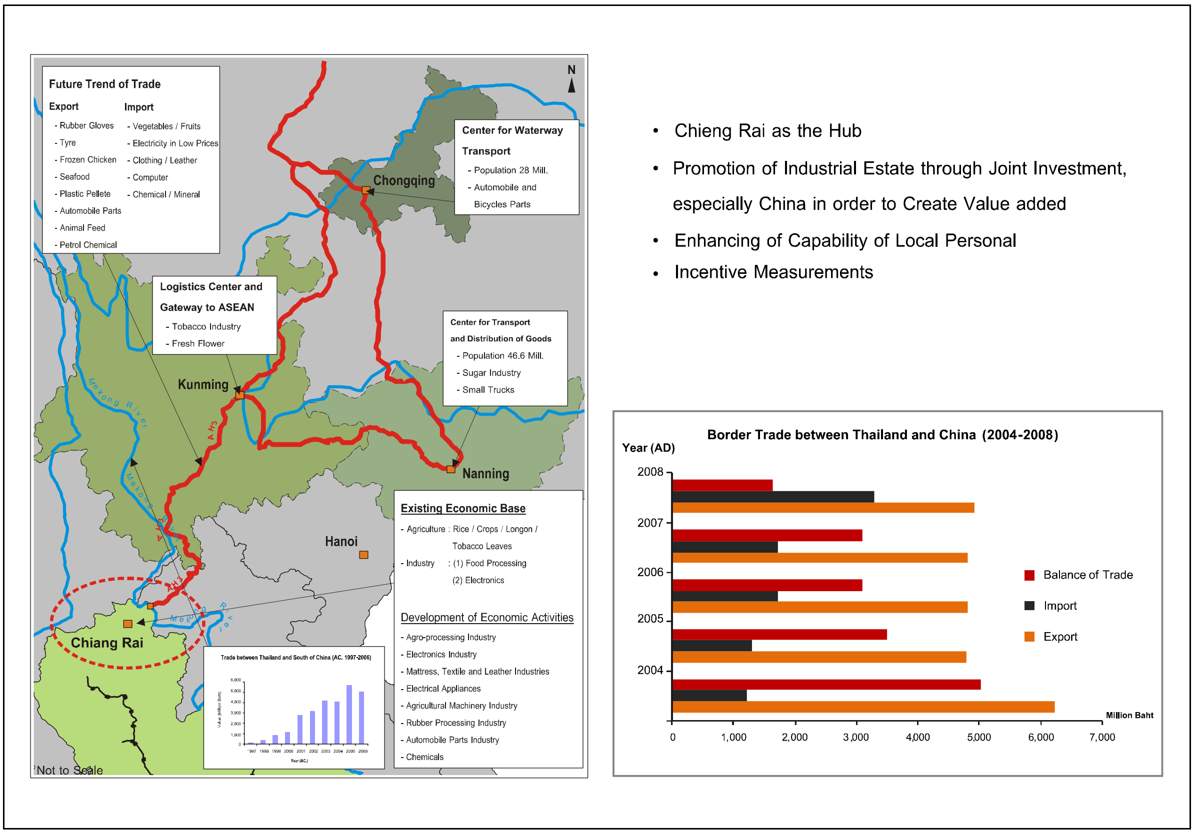
Area economic development strategy linking between Thailand and potential neighboring countries consisting of:

(1) Areas linking to neighboring areas with high growth rates. These areas are the linkage between Northern Thailand and Southern China with the goal to expand the market base of export from Thailand to consumers' markets in China or the enhancing of quality of Chinese goods to export to world markets. The reason for this come from the fact that the Northern Thailand has the potentiality to cooperate with China in implementation since Southern China contains consumer markets and tourism markets, and China has a base of industrial production of low quality goods. China also has problem on FTA with several countries and requires to use Thailand as the base for improving of quality of goods and being the gateway of trade to world markets. The strategy for driving the market and production potentiality in the Northern Thailand is shown in Figure 3-8.

- Chiengrai is defined to be the hub for collection and distribution of goods between Thailand-Southern China and transport of cross border trade with China.
- Establish the bordering industrial area to accommodate joint investment especially with China in order to enhance the quality of industrial products from China, and the production of agro-processing products and industrial goods for selling in other markets and outside the region.
- Creation of incentives for operators through tax measures and special economic area for alien labor.

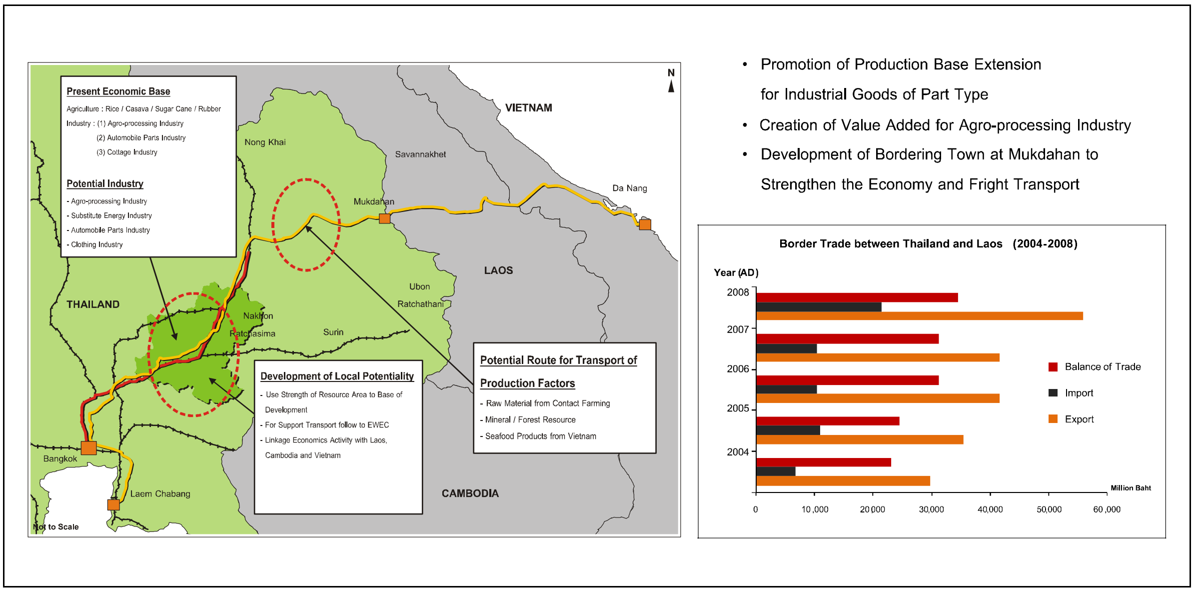
(2) The linkage point on the new potential transport route at Mukdahan and the Andaman coast in the future or on the EWEC must be considered by the expansion of production base of new products for the region and inter-regions since there is no clear cut in land transport linkage from the Mukdahan custom house to the Pacific Coast to the deep sea port at Danang. The border trade at this point is, therefore, mainly between Thailand-Laos-Vietnam while the linkage to the Andaman Seacoast is still unclear and the harbor potentiality is only for the regional trade of consumers' goods.

The strategy to support the increased of goods volume on the EWEC linking to Danang Port and the port on the Andaman Seacoast (Figure 3-9) needs the development for mass production as the driving force to be considered depending on the old policy as:



Source: AMP Consultants Ltd.

Figure 3-8 Implementation of Special Industrial Economic Area in Bordering Town



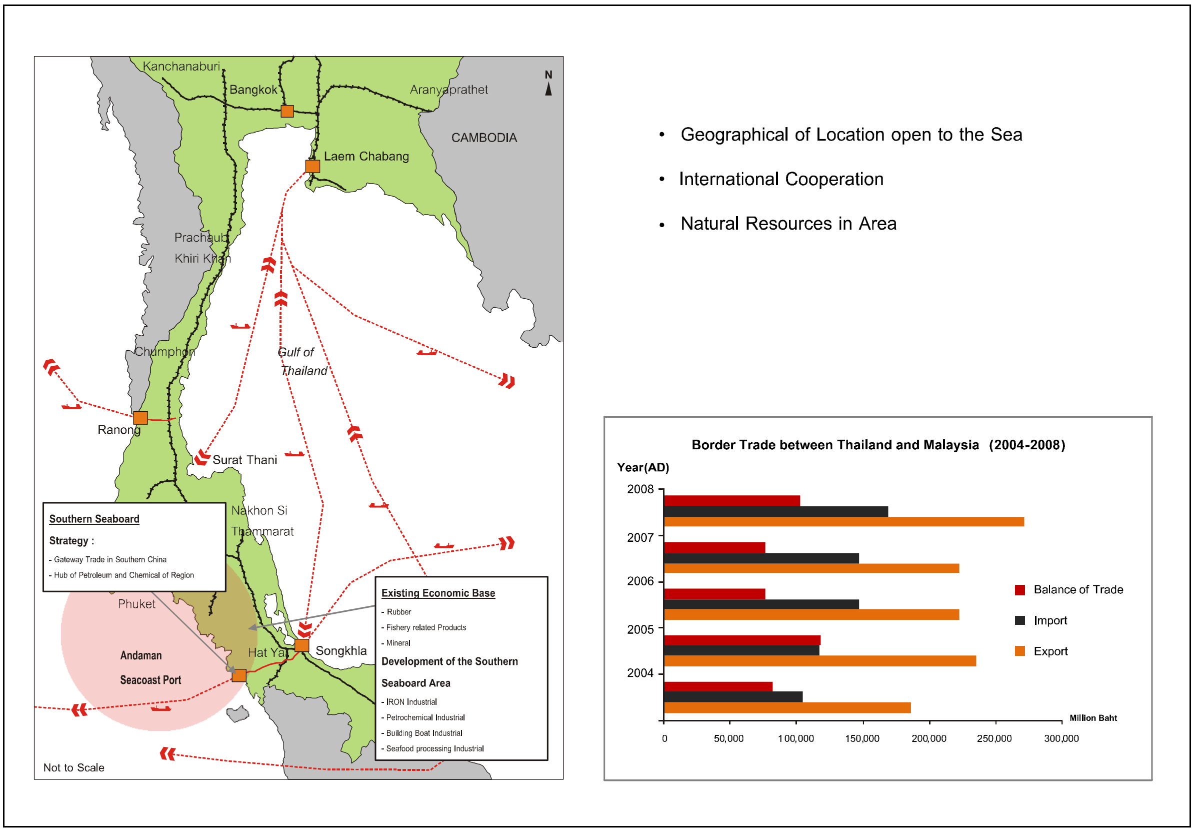
Source: AMP Consultants Ltd.

Figure 3-9 Implementation of Special Industrial Economic Area in the Northeastern Region

- Promotion of expansion of industrial base for production and logistic systems in the Northeastern Region at Nakhon Ratchasima and Khon Kaen Provinces respectively, The main strategy is supporting the readiness of the infrastructure for the industrial base for more completeness to support the expansion of production base and freight transport to the existing Laem Chabang Port and the Andaman Seacoast or the Danang Port in the future.

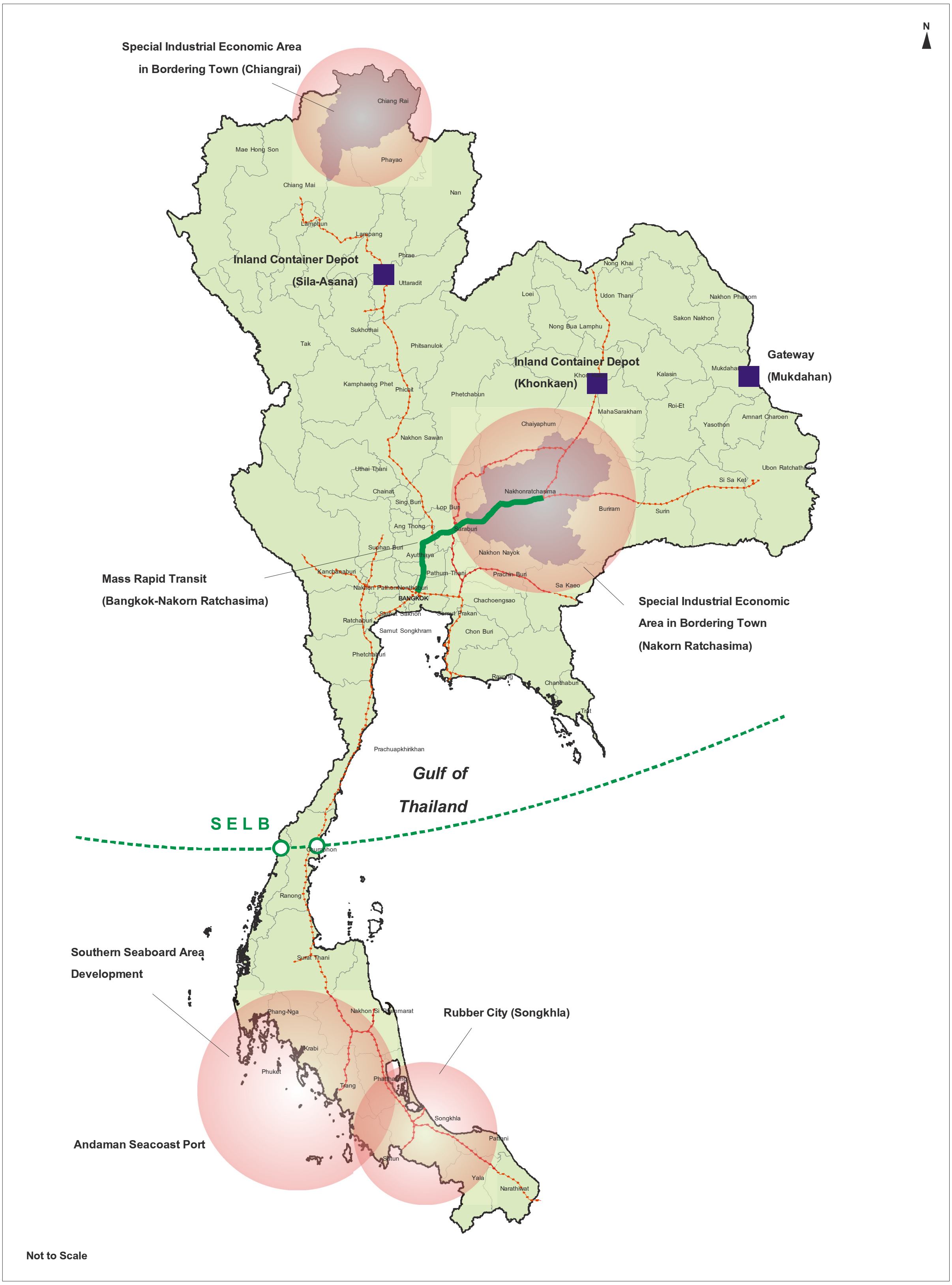
- Conduct feasibility studies in order to enhance the possibility for development of the Southern region as the economic force of the country. The result will increase in the volume of trade flow and full utilization of the natural resources in the Southern region.

(3) Industrial plant survey project to set up an Industrial Intelligence unit and develop an approach of a central supportive industrial information centre in Chiang Mai, Nakorn Sawan and Nakorn Ratchasima provinces, (Figure 3-10)



Source: AMP Consultants Ltd.

Figure 3-10 Implementation of the Southern Seaboard Area

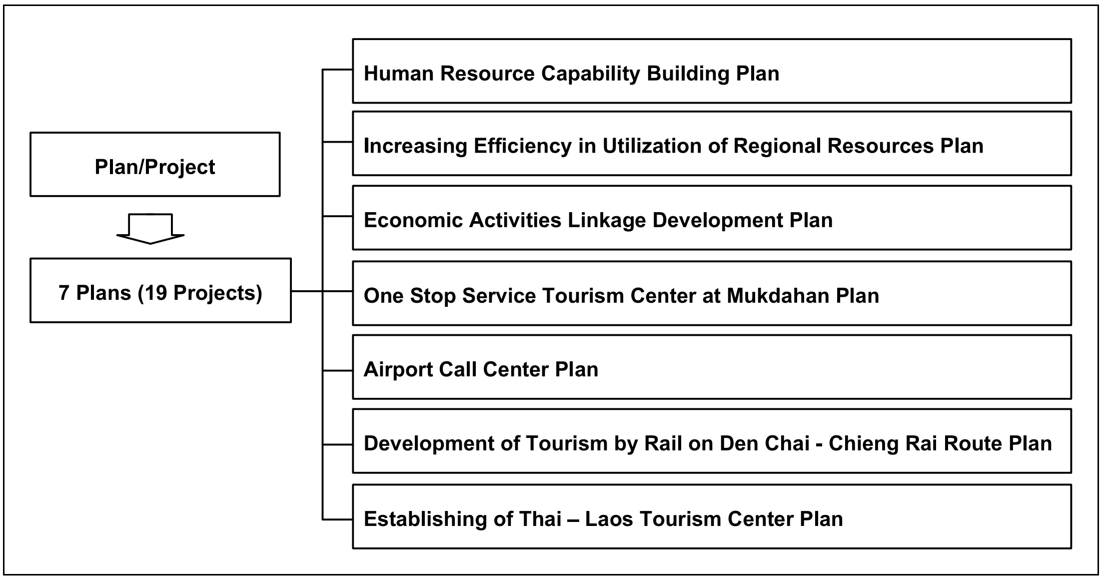


Source: AMP Consultants Ltd.

Figure 3-11 Strategy for Area Development of Thailand Linking to Neighboring Countries

3) Plans/Projects of the Area Economic Development Strategy

The area economic development strategy consists of 7 plans, 19 projects (Figure 3-12 and Table 3-2).



Source: AMP Consultants Ltd.

Figure 3-12 Plans under Area Economic Development Strategy

The plans/projects emphasize on the development of local potentiality including both personnel development and development for enhancing the efficiency of local resource used including the continuous linkage of economic activities among the regions of Thailand in production and common use of resources leading to production of export goods to the new potential markets. The potentiality of Thailand from the tourism places inside the country and through being the tourism center of the region creates supporting plans emphasizing to the new tourism places in the Northeastern Region and linking to Laos, Vietnam and Cambodia.

According to the plans/projects under the area economic development strategy, the Ministry does not have direct responsibility, but should play the role of coordination for implementation, including support for practical activities, for example, development of transport networks or facilitating related legal convenience in order to enable efficient implementation of the plans.

Table 3-2 Plans/Projects under the Area Economic Development Strategy

Plans/Projects	Budget (Million Baht)	Planing Period														
		Urgent		Short Term			Medium Term					Long Term				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Area Economic Development Strategy																
Human Resource Capacity Building Plan																
- Traing of Personnel in Chieng Khong, Chieng Rai and Luang Nam Tha	24															
- Training of Personnel in Mukdahan and Sawannakhet.	24															
Increasing Efficiency in Utilization of Regional Resources Plan																
- Research and Development of Production, Modern Management, and Utilizaion of Modern Production Through Budget Support to the Regional Universities (Mae Fah Luang University and Ubonrajthani University.	40															
Economic Activities Linkage Development Plan																
- Development of linkage in Sawannakhet (In the Sawan-seno industrial Estate)	50															
- Development of Linkages in the Upper North (Chieng Rai and Lampang)	50															
- Development of Linkage in the Upper Northeast region (Khon Kaen)	50															
- Development of Linkage in the Lower Northeast (Nakhon Ratchasima)	50															
One Stop Service Tourism Center at Mukdahan Plan																
- Construction of Tourism Center	10															
- Dissemination of Tourism Data in Adjacent Provinces: Nakhon Phanom, Sakol Nakhon	2															
- Exemption of Cross Border Fee at Mukdahan for Travelers Staying Overnight at Mukdahan	2															
- Cooperation with Operators of Restuarants, Hotels and Shops in Mukdahan, Nakhon Phanom, Sakol Nakhon inSetting Up of Interesting Tourism Routes and Sale Promotion of the Operators.	2															
Airport Call Center Plan																
- Establishing of Call Center System	8															
- Establishing of Database of Airline Flights Coming In/Out the Sawannakhet Airport	4															
- Establishing of Database on Tourism Places, Shops, Hotels, Restuarants of Both Countries Connecting to Sawannakhet Serving Both Air and Land	4															
Development of Tourism by Rail on Den Chai-Chieng Rai Route Plan																
- Capital Mobilization for Development of Tourism by Rail on Den Chai-Chieng Rai Route.	1															
- Continuous Move for Development of Railway Den Chai-Chieng Rai Route	2															
Establishing of Thai-Laos Tourism Center Plan																
- Construction of Tourism Center	15															
- Dissemination of Information on Tourism Places of Thailand and Laos.	3															
- Establishing of Tourism Network wiith Operators of Restuarants, Hotels, Shops in Thailand and Laos.	3															
Total	**344**															

Source: AMP Consultants Ltd.

3.5 Transport System Management Strategy

Transport system management strategy is for accommodating development of the expansion of economic, trade, and investment route under the concept that Thailand obtains the benefit from the economic value added derived from freight transport and investment between Southern China and Thailand and among Laos, Vietnam, and Thailand. The objective of the strategy is the management for higher efficiency of the transport system and logistics in the country using the demand driven to accommodate the expansion of new economic route.

1) Linkage in the Transport and Logistics System

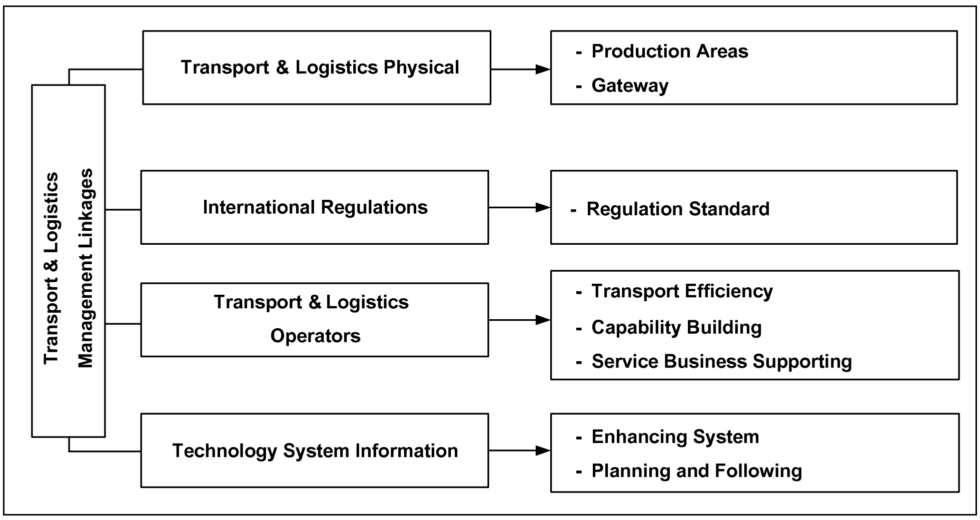
Linkage of management of the processes within the transport and logistics system including the supply chain consists of (Figure 3-13):

(1) The physical linkage of the transport and logistics system within the production, processing, and packaging areas including various trade gateways such as ports and border trade openings using the principle of demand leads supply.

(2) The same standard of international regulations and domestic codes of practice should be developed in order to obtain efficient transport and logistics system.

(3) Linkage of transport and logistics operators in order to enhance not only transport and logistics efficiency but also the competitive capability of the operators to accommodate the free service business in the future.

(4) Linkage of data through the information technology system in the management system in order to enhance the efficiency in business, activities, planning and follow up of transport and logistics implementation.



Source: AMP Consultants Ltd.

Figure 3-13 Transport System Management Strategy

The framework of Agreement on the economic cooperation in the GMS consists of principle programs linking the transport system network and economic development on the North-South Economic Corridor, the East-West corridor and an area economic development on the Southern Economic Corridor are shown in Figure 3-14. The strategy for the economic development and investment in the new trade lane has analyzed the main guideline for Thailand to use the comparative advantage of geographical location and economic status to develop the country to become the hub for transport and investment in the GMS with the main targets being the development of investment and trade, including the transport and logistic system to link Southern China, Laos, and Vietnam to other regions of the world.

Source: ADB, GMS Transport Strategy 2006-2015

Figure 3-14 Overall Transport System Structure in the GMS

The strategy of transport system management, therefore, uses the Chiengkhong custom house, the Laem Chabang Port, the Mukdahan custom house, and the harbors in the west coast and the east coast as the main trade gateways of the country. The study framework emphasized the development of the transport system, the operators and logistics to support the industries and goods to be produced in the future using local raw material. This can be called the resource-based strategy creating efficiency to induce foreign investment, development of sustainable resources usage and linkage between industries and businesses. The other format was the flow of goods through the Chieng Khong custom house, and Mukdahan custom house to transfer to Laem Chabang or the harbor in the western coast to link the transport and logistics system in order to respond to the expansion of economy, trade, and investment.

2) International Linkage of Logistic System

(1) The logistic system of the Northern Region and the Southern China:

Transport in the Northern Region that can be linked with Southern China consists of three formats, land transport, waterway transport, and aviation transport. The waterway is currently used as the main trade route, via the Mekong River, for freight transport between Thailand and Southern China.

The custom houses at Chiengsaen and Chiengkhong are the official gateways for goods being transported. The Chiengsaen custom house is the channel for transport of goods linking with China. The ships with agricultural products such as apples and garlic from China to Guanloey Port and Chieng Rung Port and transport back the consumer goods to Southern China. The custom house at Chiengkhong is the freight transport channel linking to Laos. The goods exported from Thailand are fuel and vehicle parts while Thailand import mineral such as coal. Transport from the custom houses at Chiengsaeni and Chieng Khong to other regions of Thailand mostly use the road network.

(2) The logistic system of the Northeastern – Laos – Vietnam

The main custom houses in the Northeastern region are the Nongkhai custom house and the Mukdahan custom house. Transport through the Nongkhai custom house is mainly by road transport. Most of the goods are fuel oil that Laos imports from Thailand. The import goods of Thailand are not much. Most of the imports are processed wood and wood products. There is also transport of fuel of oil through Laos to the Southern China both by road and rail (rail transport of fuel oil must be trans-shipped to truck at the Khonkaen fuel warehouse) Transport through Mukdahan is road transport passing through the Second Friendship Bridge. Most of the goods are imports and exports to Laos with some parts of the commodity as motorcycle parts are transported across Laos to Vietnam.

Linkage of logistics systems of the Northeastern Region to Laos-Vietnam are mostly land and waterway transport (as ferry crossing the Mekong River). Land transport is the main freight transport among Laos, Vietnam, and Thailand.

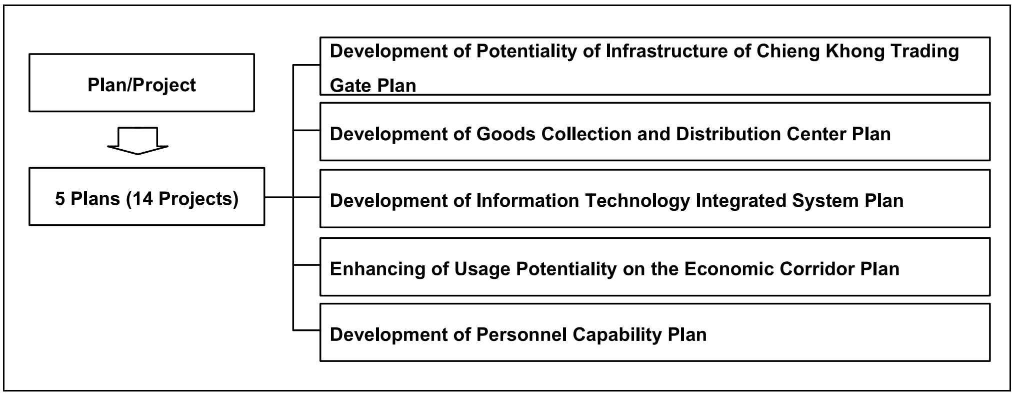
(3) The logistic system of the Southern Region:

The important custom houses in the Southern Region are the Sadao and the Padang Basar custom houses. Transport through the Sadao custom house is mainly road transport since there is a linkage to the motorway in Malaysia. Goods transported through the Padang Basar custom house are by rail and truck since the rail network of Thailand is linked to that of Malaysia enabling the transport up to Singapore. Most of the exports are rubber and rubber products from Thailand to Malaysia.

Transport linkages from the Southern Regions of Thailand to foreign countries are in three modes, land transport, aviation transport and waterway transport. Land and waterway transport are mainly for goods while aviation transport is focused on tourist passengers.

3) Plans/Projects under the Transport System Management Strategy

The strategy for the management of transport system consists of 5 plans, 14 projects (Figure 3-15 and Table 3-3).



Source: AMP Consultants Ltd.

Figure 3-15 Plans under the Transport System Management Strategy

The plans/projects according to the strategy to respond to the trade, investment, and freight transport linkages among countries in the Region emphasize the linkage between the Northern Region of Thailand and Southern China on the R3 Route. The potential custom house is needed not only to support the production and trade of the region, but for the establishment of the goods collection and distribution center that can accommodate the multimodal transport that is set within the strategy. To enhance the efficiency of the Thai operators, mostly are small, grouping is essential. The common use data center should be established with the major characteristic of single standardization of data that can be linked between users. The development of personnel capability of the operators is essential for strengthening efficiency and the development of personnel in the overall system.

Implementation according to the plans/projects under the strategy for the transport system management is partly under the responsibility of the Ministry of Transport. These are the establishment of centers for collection and distribution of goods in order to accommodate the multimodal transport, and the promotion of transport on the suitable and efficient routes. The Ministry of Transport should also play the leading role in the coordination of transport data linkage among the operators, as well as facilitating on the necessary regulations.

Table 3-3 Plans/Projects under the Transport System Management Strategy

Plans/Projects	Budget (Million Baht)	Planing Period														
		Urgent		Short Term			Medium Term					Long Term				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Transport System Management Strategy																
Development of Potentiality of Infrastructure of Chieng Khong Trading Gate Plan																
- Construction of Chieng Khong Custom House	1,000															
- Construction of Cold Storage-Warehouse	500															
- Development of Container Yard Near the Chieng Khong Custom House	100															
- Construction of Branch Office of the Office for Supporting Industrial Development	100															
- Research and Developmeent of Agro-Industry/Regional Industry for Substitute Energy	100															
Development of Goods Collection and Distribution Center Plan																
- Construction of Goods Collection and Distribution Center for Multimodal Transport	1,000															
Development of Information Technology Integrated System Plan																
- Development of Hi-speed Internet Network	100															
- Construction of Regional Transport Management System	5,000															
- Research and Development for Standardization of Data Linkage	250															
Enhancing of Usage Potentiality on the Economic Corridor Plan																
- Research on Analysis of Toll Taxing	20															
- Development of Truck Insurance for International Transport	20															
- Development of Temporary Measures During the Period That the Party Countries cannot Implement According to the Agreements	10															
Development of Personnel Capability Plan																
- Enhancing of Potentiality of Industrial and Logistics Operators	30															
- Development of Labor Skill for Regional Industries																
Total	**8,260**															

Source: AMP Consultants Ltd.

3.6 Development of Transport Network Linkage Strategy

Analysis of current situations and problems in network linkage enable the Consultant to lay down the framework for strategic planning of development of the transport network. The major strategy is to enhance efficiency in the freight transport process and to reduce the cost for the operators and users in order to increase the potentiality of Thailand in competing for being the transport hub for the Indochina Region. The study defined that the main network consists of the North-South Corridor of Thailand with the potentiality to accommodate high volume of freight transport comparing to the networks of the neighboring countries. Transport from the Chiengkhong custom house, Chiengrai Province, to the Laem Chabang Port or the Andaman Seacoast port, has the transfer point at Sila Asana. For the East-West network, transport from Mukdahan to the Laem Chabang Port has a transfer point at Thapra Station, Khon Kaen Province.

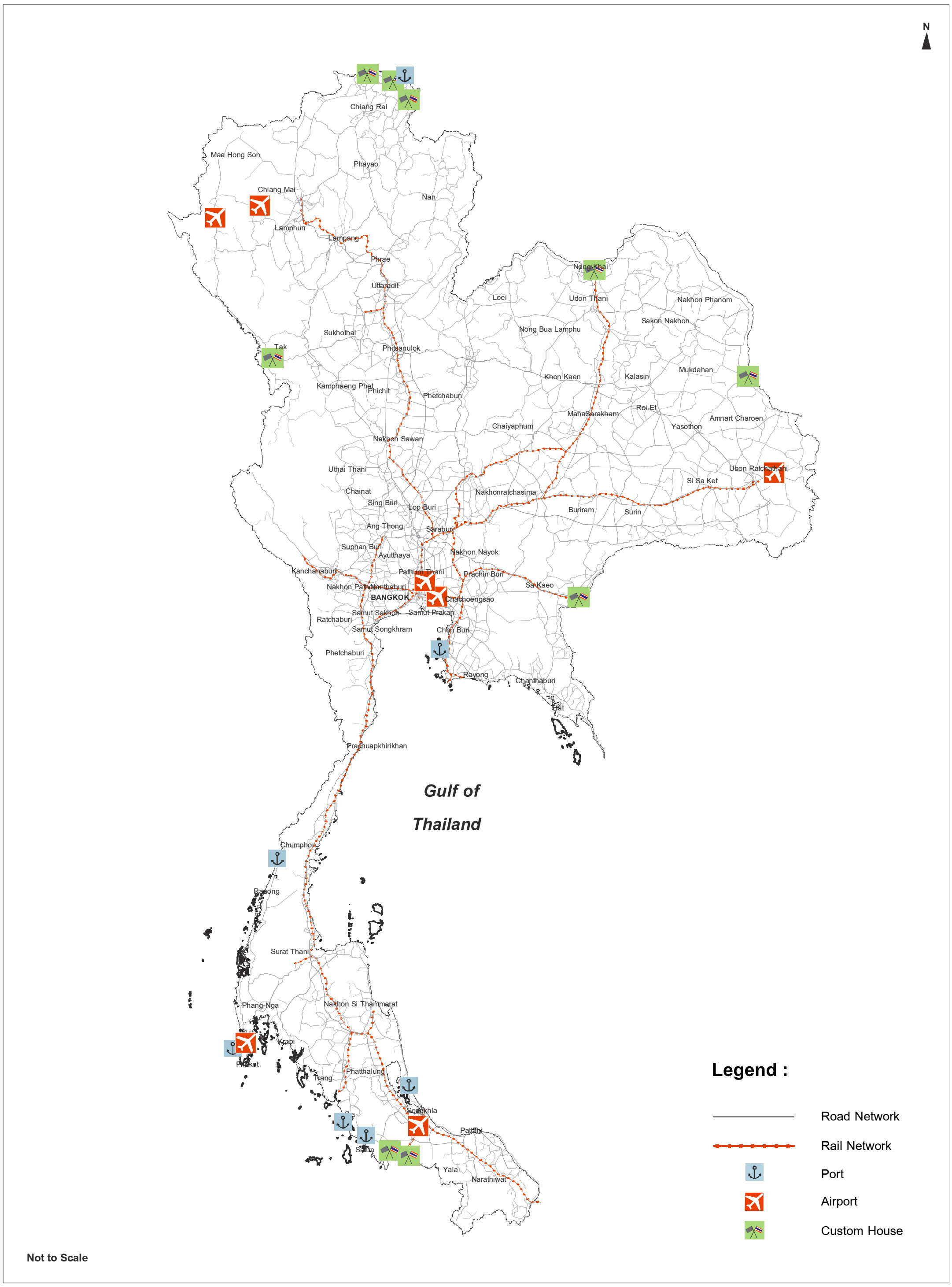
For the short term development, the Laem Chabang Port is set as the main gateway of the country. In the future, if the Laem Chabang Port is used to its full efficiency and the volume of goods is high enough for exporting to the Western countries, there must be development of ports on the Andaman Seacoast to help cater for the volume of goods, and to be the gateway to the European Union, countries under the BIMSTEC, and countries in the Middle East. The Laem Chabang Port can still be the gateway to the U.S.A., East Asia, and Australia. Thailand can use these networks to promote the value added to the Thai economic system through the mechanism of collection and distribution of goods and raw materials from China, including linkage to the industrial estates for processing products for export.

The reason that the Laem Chabang Port should be the main gateway of freight transport linkages with other regions based on the fact that, currently, it is the port with the highest potentiality in infrastructure, service quality, and capacity to accommodate the volume of goods passing through. The management emphasizes that the inflow-outflow of goods from China should pass through the Laem Chabang Port as the gateway to other regions. The high traffic of goods transported at the Port will attract the shipments to stop for loading-unloading of goods that will reduce the time and expenses of transferring of goods to feeders at Singapore or Malaysia for further shipment to Thailand in case the Laem Chabang Port does not have enough volume of goods.

To use the Laem Chabang Port as the gateway for freight transport between China and other regions to help balancing the volume of import and export containers, Thailand as the exporter, still faces the problem of inadequate containers for exporting. To carry empty containers to load goods for export results in a higher cost of freight transport. However, if the management can bring in more imports, the requirement for import of empty containers will be reduced as well as the cost of transport, thus increasing the potentiality of the Laem Chabang Port. This strategy has been used by Malaysia in attempting to develop Port Klang to be a high potential port that is able to compete with Singapore.

The strategy for enhancing the potentiality of the transport network to accommodate the expansion of the economic, trade, and investment route defined the transport network on the North-South Corridor linking to the Southern China and Laem Chabang Port as the Backbone Network to support Thailand to become the transport hub of the Indochina Region.

The network on the East-West Corridor has lower potential than that of the North-South since the economies of the neighboring countries of Myanmar, Laos, Cambodia, and Vietnam are small and having low development potentiality for the development of an efficient network. The strategy of network development should be for the collection and distribution of goods and raw materials from the neighboring countries having Thailand as the center to help strengthening the potentiality of the main network and to make the East-West Corridor as the secondary network (Figure 3-16).



Source: AMP Consultants Ltd.

Figure 3-16 Transport Network Linkage in Thailand

1) Transforming Strategy into Practice

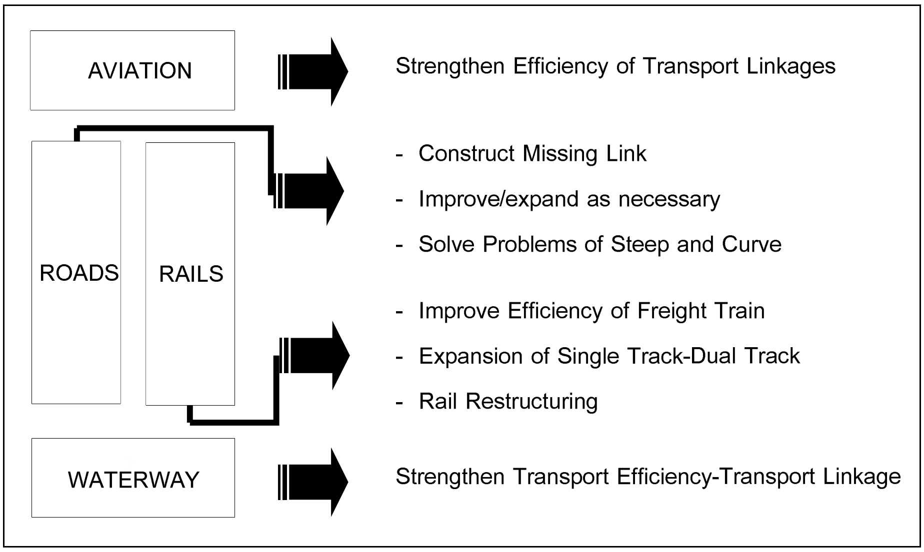
(1) Development and improvement of the missing links

(2) Development of the substitute network

(3) Development of the physical infrastructure requires time, but the thing that can be carried out easier and faster is the improvement of efficient logistics management within the production sector that each organization can implement immediately on its own.

2) Main Issues for Development

From the analysis of situations and potentiality of development opportunity and restrictions mentioned earlier, the conclusion can be made for the problems of development that leads to the main issues for development of each network as follows (Figure 3-17):



Source: AMP Consultants Ltd.

Figure 3-17 Issues for Development of Transport Network Linkage

(1) Roads

- Development and improvement of missing links
- Improve/Expand the route on some parts with heavy traffic
- Expansion of truck routes at the points of heavy traffic
- Improve the roads on parts having effects on traffic at high steep or sharp curve points.

(2) Rail

- Improve the efficiency of freight trains
- Improve or expand the single track to dual track in congested s of train operation.
- Push for the actual rail restructuring process

(3) Waterways

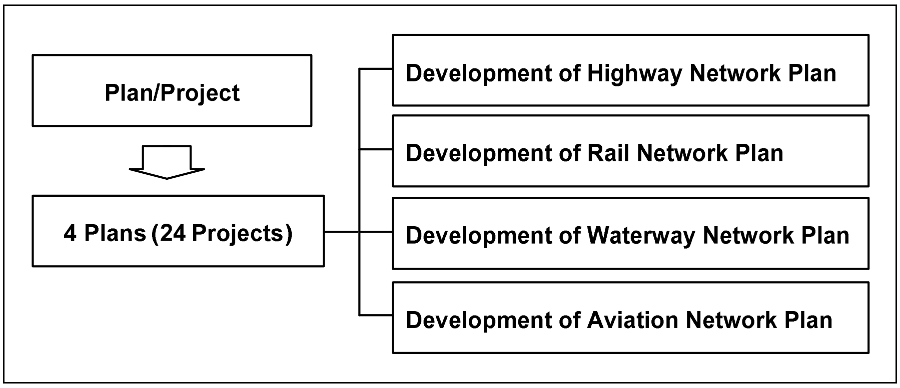
- Strengthening the efficiency of waterway transport through multimodal transport linkage.

(4) Aviation

- Strengthening the efficiency of aviation transport through multimodal transport linkage.

3) Plans/Projects under the Strategy for the Development of Transport Network Linkage

The strategy for the development of transport network linkage consists of 4 plans, 24 projects (Figure 3-18 and Table 3-4).

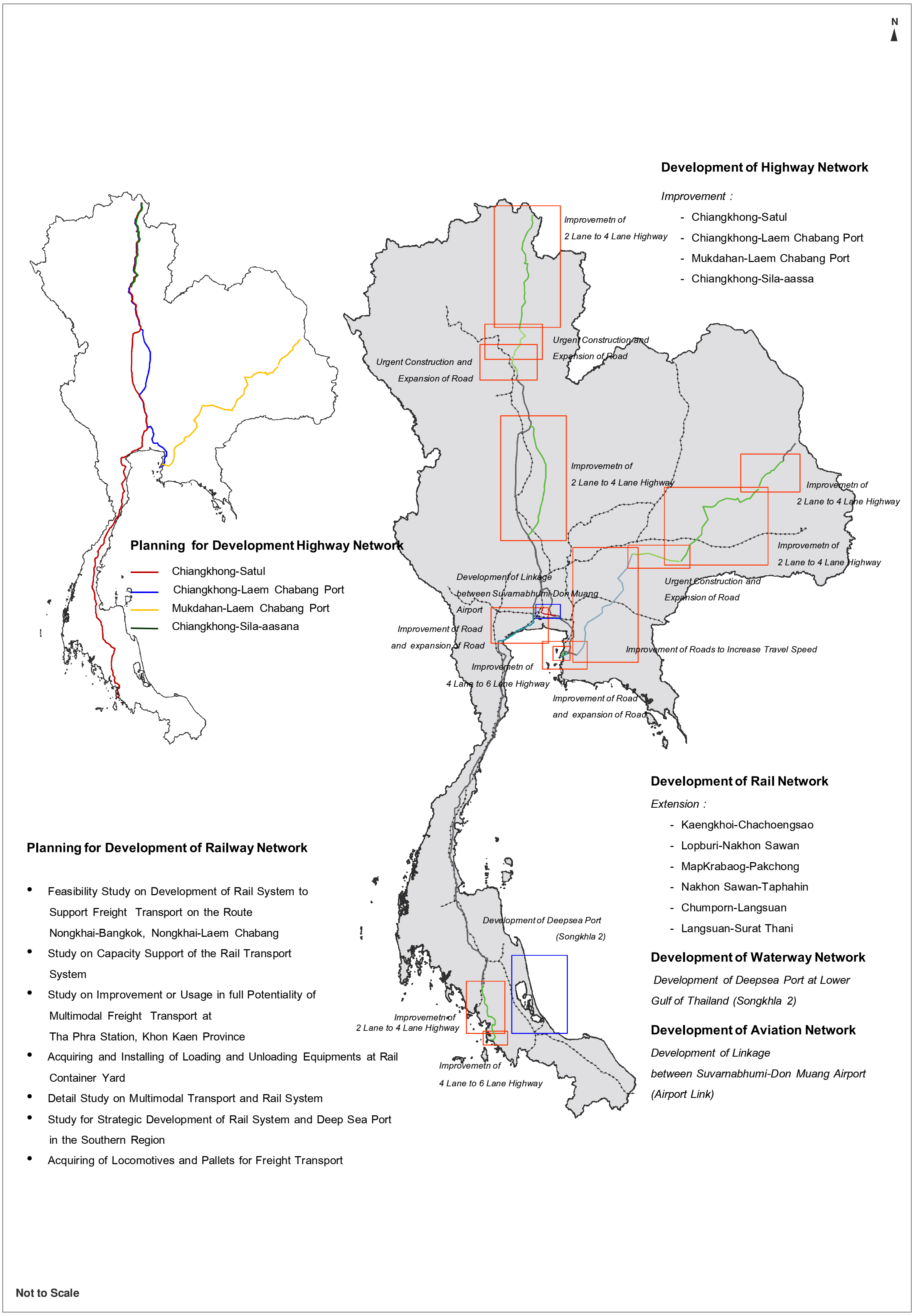


Source: AMP Consultants Ltd.

Figure 3-18 Plans under the Strategy for Development of Transport Network Linkage

The transport networks of Thailand are on the North-South and East-West Corridors and can be linked among the regions to China, Laos, Vietnam, and Cambodia, having Laem Chabang as the gateway for trade. The important program is development of the road network to accommodate freight transport on the corridor consisting of the construction of a bridge crossing the Mekong River at Chiengkhong linking to Highway R3 and increasing the capacity of the route on the parts having high traffic to provide convenience and to increase safely the speed of travel on the transport route. Other programs to accommodate transport by different modes are development of the rail network to improve the efficiency of commodity transit through the improvement or expansion of single track to dual track in bottle neck areas. Improvement of the rail line is expected to create more transport by the rail system. The development of waterway network and the aviation network are for more efficient use of the network both the deep sea port and the linkage between the Suvarnabhumi – Don Muang Airports.

The development of transport system network linkage is not the direct responsibility of the Ministry of Transport and the investment of the project has to come from the government budget. The Ministry of Transport has to consider carefully on the implementation or to use other alternative such as the permission for the private sector to take part in joint investment in some suitable projects, or by mobilizing the capital through the stock exchange market to reduce the budget burden and to have people participate in the national development (Figure 3-19).



Source: AMP Consultants Ltd.

Figure 3-19 Development of Transport Network Linkages

Table 3-4 Plans/Projects under the Strategy for Development of Transport Network Linkage

Plans/Projects	Budget (Million Baht)	Planing Period														
		Urgent		Short Term			Medium Term					Long Term				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Development of Transport Network Linkage Strategy																
Development of Highway Network Plan																
- Urgent Construction of Motorway and Expansion of Main Road to 4 lane Highway (Second Phase)	150															
- Urgent Construction of Third Bridge crossing the Mekong River at Chiengkhong-Huaykaew	80															
- Feasibility Study on Constuction of Chiengkhong-Sila Aasana	50															
- Improvement of 2 Lane to 4 lane Highway with total length of 748 kilometers	18,260															
- Improvement of Roads to increase travel speed with total length 198 kilometers	1,530															
Development of Rail Network Plan																
- Acquiring and Installing of Loading and Unloading equipments at Rail Container Yard	75															
- Feasibility Study on Development of Rail System to Support Freight Transport on the Route Nongkhai-Bangkok, Nongkhai-Laem Chabang	40															
- Study on Improvement or Usage in full Potentiality of Multimodal Freiight Transport at Tha Phra Station, Khon Kaen Province	40															
- Study on Capacity Support of the Rail Transport System	30															
- Study on Development of Usage of Rail Container Yard Emphasizing on Convenient and Fast Multimodal Transport	30															
- Study on Support for Rail System Development and Rail Container Yard or Inland Container Depot	30															
- Detail Study on Multimodal Transport and Rail System	40															
- Study for Strategic Development of Rail System and Deep Sea Port in the Southern Region	40															
- Acquiring of Locomotives and Pallets for freight Transport	4,610															
- Extension of Railway Kaengkhoi-Chachoengsao	10,000															
- Extension of Railway Lopburi-Nakhon Sawan	8,800															
- Extension of Railway MapKrabao-Pakchong	7,700															
- Extension of Railway Nakhon Sawan-Taphanhin	7,350															
- Extension of Railway Prachuabkirikhan-Chumporn	6,440															
- Extension of Railway Chumporn-Langsuan	6,500															
- Extension of Railway Langsuan-Surat Thani	10,200															
- Extension of Railway Denchai-Chiengrai	40,000															
Development of Waterway Network Plan																
- Developmeent of Deepsea Port at Lower Gulf of Thailand (Songkhla 2)	7,000															
Development of Aviation Network Plan																
- Development of Linkage beween Suvarnbhumi-Don Muang Airports	288,275															
Total	**417,270**															

Source: AMP Consultant Ltd.

3.7 Transformation of Strategy for Development of Transport Network Linkage into Practice According to Surrounding Situation

Transformation of strategy for development of transport system linkage into operation in order to accommodate the expansion of economic, trade and investment is the defined as the integrated plans and projects of concerned agencies aiming at the main target.

The projects and operation plans for supporting the development of the new trade lanes include those under the missions of the agencies under the Ministry of Transport as well as other outside agencies. The strategy under the current of modern economic has to be considered according to the change of competition both in trade and investment

This project has defined 3 main strategies as:

- Strategy for Area Economic Development
- Strategy for Transport System Management
- Development of Transport Network Linkage Strategy

Transformation of ***Strategy for Area Economic Development*** into practice emphasizes on enhancing of value added of area economic activities in the regions of Thailand in 3 aspects as: (1) enhancing of competitive capability of human resource in the area, (2) utilizing of regional resources as production base, and (3) developing of economic and tourism activity linkages with new potential markets. The transformed strategy into practice consists of 7 plans and 19 operation projects, with total budget of 344 million Baht.

Transformation of ***Strategy for Transport System Management*** into practice emphasizes on the enhancing of efficiency and upgrading the logistics management system of the country from the Physical Distribution level to the levels of International Integrated Logistics and Externally Integrated Logistics respectively. The strategy is divided into 2 aspects as: the Development of Freight Management System, and the Development of Thai Logistics Operators.

The development of freight management system will create the linkage of transport activities including supply chains within the country. The Consultant recommends that the transformation of strategy into practice will consist of 4 plans and 12 projects with the total budget of 8,200 million Baht. For the development of Thai logistics operators, emphasis should be on enhancing of personnel capability under a plan and 2 projects with the total budget of 60 million Baht.

Transformation of ***Strategy for Development of Transport Network Linkages*** into practice is the improvement and linking of domestic transport network along the new trade lanes emphasizing on the existing routes to link with the international routes to the potential markets. The transformed strategy is consisted of 4 plans and 24 projects which is; the urgent stage (2010-2011), short term (2012-2014), and the medium to long term (2015-2024) with the total budget of 417,270 million Baht.

There are two main issues to be considered:

- Under the current economic crisis, how the Ministry of Transport can properly select among all projects, those most beneficial and efficient ones to be implemented.
- Whether the meeting agenda of the ASEAN SUMMIT hosted by Thailand contains any issues relating to the extension of new trade lanes of Thailand.

For the first issue, under the limited budget, the Consultant is of opinion that in the urgent stage, the linkage between the South of China and the North of Thailand via the trade gate Chieng Khong is the trade lane with the highest potentiality. In the allocation of budget for the development of transport linkage to accommodate the extension of economic, trade and investment route, priorities should be given to 4 main plans as:

- Development of Potential Infrastructure of Chieng Khong Trade Gate Plan, with total budget of 1,800 million Baht.
- Freight Collection and Distribution Plan, with total budget of 1,000 million Baht.
- Road Network Development Plan, with total budget of 8,810 million Baht.
- Rail Network Development Plan, with total budget of 4,935 million Baht.

The Consultant recommends that the budget to be allocated to the Ministry of Transport during 2010-2014 for the development of linkage to the new trade lane totally 16,545 million Baht should come from the annual budgeting since such amount of required budget is not likely to be a budget problem.

In order to link between the South of China and the Upper North of Thailand via the Chieng Khong Trade Gate to the seaport at Laem Chabang, the first priority should be the expansion of road from two lane to four lane Highways from the Chieng Khong port to the railway station at Sila Asna, the transfer point of freight to the rail system, where the operators can conveniently transport the freight further by trucks or rails to Laem Chabang since the existing road system is still capable of accommodating the traffic volume. In the rail transport system development, the utilization of freight transferring areas must be developed coinciding with the recommended plans and projects.

The second issue is the relation between this study project and the Agreement arisen from the ASEAN SUMMIT meeting hosted by Thailand. The main issue to be considered is the ASEAN Trade in Goods Agreement that leads to the acceleration of free trade and supporting of intra-regional trade and inter-regional trade, and the Multilateral Trading System.

The main purpose of this Agreement is to have the CLMV countries (Cambodia, Laos, Myanmar and Vietnam) be enhanced in economic and social development as well as in transport networking in order to catch up with the neighboring countries in ASEAN. Such purpose is to support the ASEAN as a single market and production base that can generate the flows of commodities and services, investment, skilled labor, and capital in the year of 2015 in accordance with the Agreement of the ASEAN SUMMIT meeting held in Singapore on November 20, 2007.

Under the Agreement, the Initiative for ASEAN Integration: IAI Strategic Framework and IAI Work Plan 2 (2009-2015) were created in order to reduce the gap in the levels of development of the countries, increase the competitive capability of the Region especially in the member countries in need for assistance.

The IAI Program (2009-2015) contains joint economic agreements to be implemented within the frame of the main Program as:

A. Single Market and Production Base
B. Competitive Economic Region
C. Infrastructure Development
D. Integration into Global Economy

The essence of the programs in A, B, and D is the assistance given to the CLMV countries in strengthening and enhancing the capability in raising the economic status of the population. In the long run, Thailand will be benefited from the expansion of the marketing base to the neighboring countries while the potential routes will become real to exist.

The assistance to be given to the CLMV countries in the infrastructure development program emphasizes on training of the Multimodal Transport, Logistics System, and Supply Chain Management. In particular, the issues to support the Strategy for Development of Transport Linkages along the new trade lanes are the operation training for linkage construction of rail link Singapore- Kunming (N-S Economic Corridor), and the feasibility study of standard improvement of secondary roads in the CLMV countries. Such assistance increases the efficiency of linkage network between Thailand and neighboring countries as well as increases the potentiality of Thailand in becoming the transport hub of the Region according the concept of this study Project.

4. Driving of the Development Strategy

The implementation for driving the development strategy in order to achieve the objectives of the plans/ projects with the estimation of budget under the national budget frame, and the evaluation of the project investment, are detailed as follows:

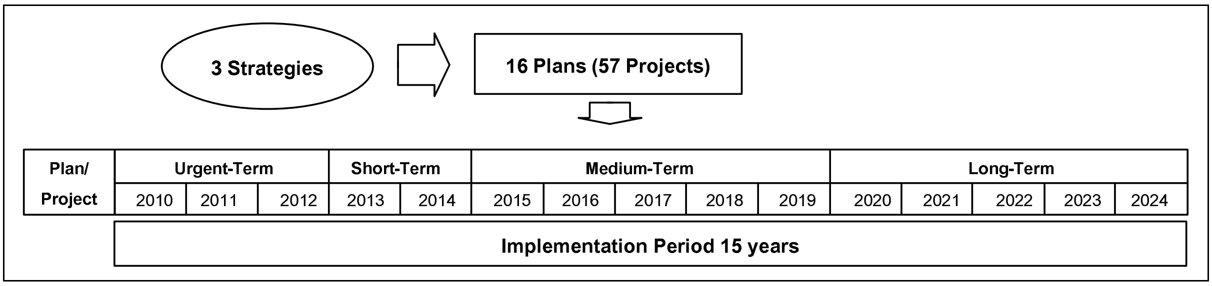
4.1 Implementation Budget

The primary estimate of the total budget for implementation of the plans/projects under the development strategy is 425,874 million Baht with the period of implementation for 15 years from 2010 to 2024. Details of the budget are shown in Table 4-1 and Figure 4-1.

Table 4-1 Estimated Budget and Implementation Period According to the Development Strategy

Strategies	Budget (Million Baht)	Period
Area Economic Development Strategy	344	2010-2017
Transport System Management Strategy	8,260	2010-2015
Development of Transport Network Linkage Strategy	417,270	2010-2024

Source: AMP Consultants Ltd.

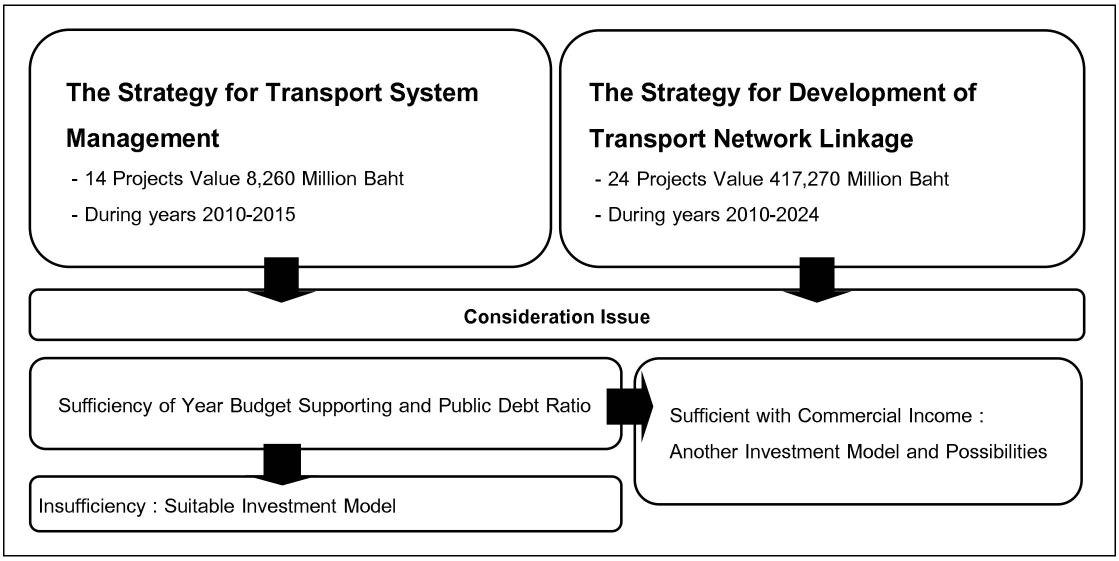


Source: AMP Consultants Ltd.

Figure 4-1 Implementation Period for the Development of Potential Transport Network Linkage

4.2 Format of Project Investment

The implementation in accordance with the development strategy that emphasizes the strategy for transport system management is the responsibility of the Ministry of Transport under the mentioned plans/projects can be done with normal budget of the responsible organizations, except for the investment budget for the development of the rail network that requires a higher budget and the need to borrow the money for investment (Figure 4-2).



Source: AMP Consultants Ltd.

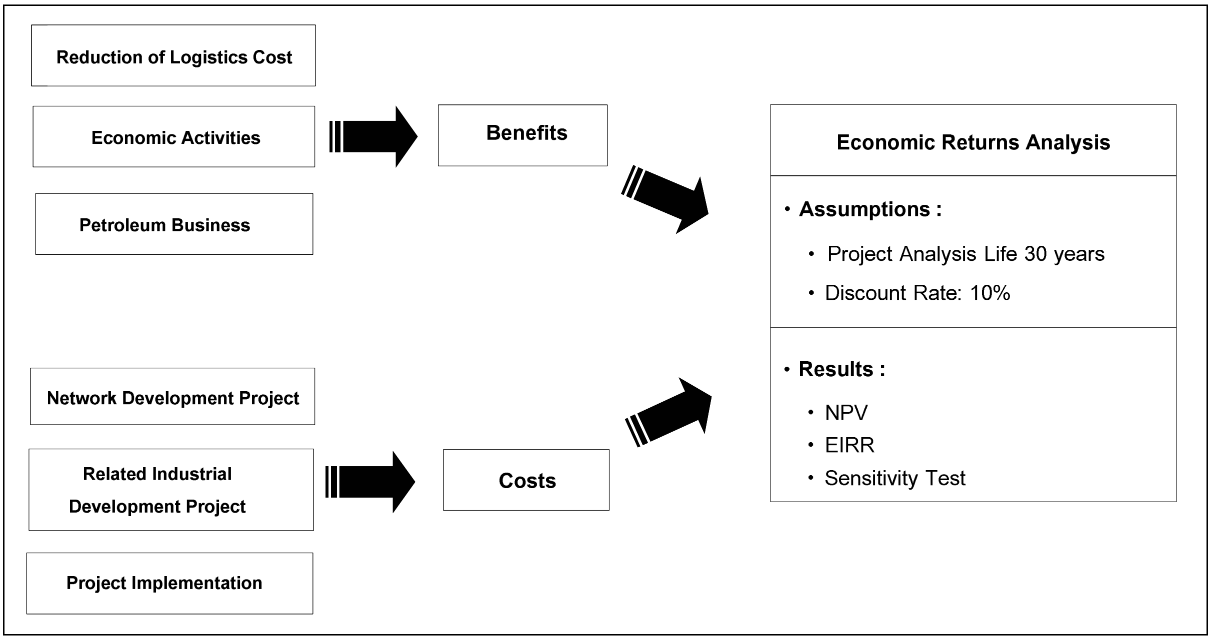
Figure 4-2 Formats of Project Investment

There are other alternatives for budget management and project investment including, for example, allowing the private sector to participate in the investment that can be carried out in different levels as employing the private sector to do the management, joint investment between the government and the private sector, cooperation between the Government and the private sector, the Public Private Partnership (PPP), or allow the private sector to invest for the whole project. These can be carried out depending on various factors such as the type of the project, pricing and return benefit, readiness of the responsible organizations, control and directing, and related law as the People Participation in the Government Activity B.E. 2536, if this can be applied, and the profit sharing must be suitable and transparent, not monopoly, by providing the benefit for Thai citizens and the country.

Another possible format of investment is the mobilization of capital through the issuance of bond or funds. The basic formats of capital mobilization for the large scale project are (1) selling of shares to general people by registering of shares in the stock market (2) securitization, and (3) infrastructure Fund. Selection of format of capital mobilization depends on the government policy and the return benefit to the investors.

4.3 Investment Worthiness in Transport Network Strategy

Consideration of investment worthiness in the transport network strategy is based on the analysis of economic benefit of the overall development of the transport network including the benefit of development. The potential goods that can create the value added to the economic system on the new trade lane are analyzed. The benefit of investment is evaluated economically in terms of Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) of the project. The benefits of two important projects are evaluated. These two projects are the area network development of linkage between Thailand and the Southern China, and the transport linkage development and the oil business between the coast of the Gulf of Thailand and the Andaman Seacoast (Figure 4-3).



Source: AMP Consultants Ltd.

Figure 4-3 Overall Analysis of Economic Return

1) Concept in Analysis of Economic Return of Investment

The framework for analysis is under the basic concept for consideration of investment of large scale infrastructure projects based on the benefit to the economic system rather than the monetary return. The government as the investor places emphasis on the spill-over effect to the private sectors who are the tax payers. The benefits to the economic activities of private sectors can be seen as an important result of the projects.

Analysis of economic return of investment under the strategy depends on the important assumptions, the government policy to continuous support the trade and investment linkage. The analysis period is 30 years.

The economic cost comes from the value of investment of various projects under the strategy for the development of network. Unrelated costs such as the monetary costs, the land ownership fees, are deducted.

2) Concept on Evaluation of Investment Benefit

The evaluation of economic benefit of the implementation of the strategy consists of two main variables, the increased return from the reduction of the logistics cost and the increased return from the value added in the production and exchange activities.

(1) Increased return from the reduction of logistics cost

The increased return from the reduction of the logistics cost derived from the adaptation of the logistics process to respond to the development of the transport system network making reduction in management cost and transport cost. For example, more use of containers in transport enhances the efficiency of management of the inbound logistics and the outbound logistics including the backhaul. Increase of freight volume also derives in saving from the economy of scale and the total cost of the logistics system of the country.

(2) Increased return in the production and exchange activities

The economic benefit in this case is the economic value added in the production activities or the trading activities derived from the implementation of programs/projects under the strategy and the expected trade from the implementation of projects that create more economic activities.

The economic value added is calculated from the GDP on the production sectors in terms of total value of final goods and services produced in the country within a year at the market prices of those goods and services. The value of the stock is also included since it is considered as the final product.

3) Concept of Evaluation of Economic Cost of the Project

The economic cost of the project can be obtained from the value of investment of projects under the strategy that consists of:

(1) The cost for the development of the transport network linkage including construction costs and land ownership fees, from the primary estimate of the project cost.

(2) The costs for the development of relate industries.

(3) The operation and maintenance cost.

4) Results of Analysis on Economic Return of Investment

(1) Increased return from reduction of logistics cost

The increased return from the reduction of logistics cost consists of the calculation of the reduction for logistics cost from (1) change of freight loading method to the use of containers (2) increase of freight volumes, and (3) change of transport route. The total calculated reduction of logistics cost is ***2,019 Million Baht*** (Table 4-2).

Table 4-2 Return from reduction of Logistics Cost (2009 price)

Return from Reduction of Logistics Cost	Value (Million Baht)
Return from changing frieght loading	670
Return from increasing of freight volume	1,073
Return from chaning of transport route	276
Total	**2,019**

Source: AMP Consultants Ltd.

(2) Increased return in production and exchange activities

The estimation is based on interviewing the operators of related businesses with experience and skills in analysis of possible trends of value added from the economic activities to be formed once the new trade lane is opened. The estimated demand of goods, value added per unit, the assumption for calculation of value added, and the return from the production and exchange activities are:

- The value added of potential goods includes processing of natural rubber, frozen chicken, processed seafood, tropical fruits, dried foods, processed fruits, plastic pellets, automobile parts, petroleum products, chemical and chemical fertilizer, electrical appliance, computer, clothing and textile, and animal feed, for the first year will be ***23,830 Million Baht.***

- The value added of goods on the route linkage between the Northeastern Region-Laos and Vietnam are for the potential goods of cassava, smoked rubber plates, automobile parts, and processed agricultural products. The total value for the first year will be ***2,490 Million Baht.***

(3) Increased return from economic linkage of the Southern Region and other regions of the world.

The economic linkage using the Strategic Energy Land-Bridge (SELB) to link the transport and business in oil between the seacoast of the Gulf of Thailand and the Andaman Sea make it possible that there will be transport of crude oil to the target market of China, South Korea, and Japan creating the value added of one million barrels a day or 58,035 million liters a year[1]. Since the value added of the production is 2Baht/Liter, the calculated value added will be ***116,070 Million Baht per year.***

[1] 1 barrel = 159 liter

5) Evaluation of Cost

The evaluation of project investment including the economic activities linkage between the Southern Region and other regions in accordance with the Strategic Energy Land-bridge (SELB) in the period of 30 years using the conversion factors (CF) to converse the financial cost to the economic costs and use the conversed values to calculate the economic values by the NPV and EIRR of the project (Table 4-4).

Table 4-3 Factor for Converting Financial to Economic Cost

Type	Value
Standard Conversion Factor (SCF)	0.93
Construction Conversion Factor (CCF)	0.88
Electricity Conversion Factor (ECF)	0.90
Intermediate Goods Conversion Factor (IGCF)	0.94
Labour Conversion Factor (LCF)	0.92
Transport Conversion Factor (TCF)	0.87
Consumption Goods Conversion Factor (CGCF)	0.95
Capital Goods Conversion Factor (CGCF)	0.84
Machinery Conversion Factor (MCF)	0.87
Petroleum Conversion Factor (PCF)	0.96
Vehicles and Parts Conversion Factor (VPCF)	0.73

Source: The World Bank.

Table 4-4 Economic Cost after Conversion Factors Adjustment

Year No.	Years (AD)	Cost (Baht)	Year No.	Years (AD)	Cost (Baht)	Year No.	Years (AD)	Cost (Baht)
1	2010	1,524	11	2020	50,823	21	2030	7,083
2	2011	3,149	12	2021	46,919	22	2031	7,384
3	2013	89,790	13	2022	27,912	23	2032	8,774
4	2013	158,223	14	2023	28,116	24	2033	8,030
5	2014	286,191	15	2024	26,285	25	2034	8,378
6	2015	160,787	16	2025	24,464	26	2035	8,743
7	2016	102,811	17	2026	24,700	27	2036	8,589
8	2017	68,678	18	2027	5,728	28	2037	8,454
9	2018	57,614	19	2028	6,525	29	2038	8,877
10	2019	52,170	20	2029	6,797	30	2039	9,320
Total = 1,312,838 Baht								

Source: AMP Consultants Ltd.

6) Economic Return

(1) Net Present Value (NPV)

The Net Present Value is the difference between the present values of saving financial costs expected to receive each year through the project years.

The NPV shows the value of the considering project. The positive value shows that the project is worth investing. From the calculation, the NPV of the implementation under the strategy is 2.58 Trillion Baht based on the discount rate 10% within 30 years (Table 4-5).

(2) Economic Internal Rate of Return (EIRR)

The economic Internal Rate of Return means the discount rate that makes the present value of cash flow expected to invest equals to the NPV of the project.

The calculation of EIRR is to find out the discount rate that makes the NPV equals to Zero. If the EIRR is more than or equals to Zero, the project is economic worth investing. From the calculation of EIRR of the implementation of the strategy, the EIRR value is 17% based on the discount rate 10%. (The details are shown in Table 4-5)

Table 4-5 Increased Economic Return from the Economic Activities

Economic Return Analysis:	
Economic Internal Rate of Return: EIRR	17%
Net Present Value: NPV	2,560,551.49 Million Baht
Benefit-Cost Ratio: B/C	3.15

Source: AMP Consultants Ltd.

(3) The Sensitivity Test Analysis

The sensitivity test is done in 4 cases as the project cost is decreased 10% or 20%, and the benefit is decreased 10% or 20% (Table 4-6).

Table 4-6 NPV and EIRR in Cases of Increase Costs and Decrease Benefit

Scenario	NPV (Million Baht)	EIRR (%)	B/C
Base Case	2,560,551.49	17	3.15
Project Cost Increased 10%	2,441,202.58	15	2.90
Project Cost Increased 20%	2,321,853.67	13	2.70
Project Output Decreased 10%	2,185,147.43	15	2.89
Project Output Decreased 20%	1,809,743.37	12	2.56

Source: AMP Consultants Ltd.

From Table 4-6:

- Case 1: When the project benefit is fixed and the cost increases 10%, the NPV is 2,441,202.58 Million Baht and the EIRR decreases from the Base Case to 15%.
- Case 2: When the project benefit is fixed and the cost increases 20%, the NPV is 2,321,853.67 Million Baht and the EIRR decreases from the Base Case to 13%.
- Case 3: When the project cost is fixed and the benefit decreases 10%, the NPV is 2,185,147.43 Million Baht decreases from the Base Case to 15%.
- Case 4: When the project cost is fixed and the benefit decreases 20%, the NPV is 1,809,743.37 Million Baht decreases from the Base Case to 12%.

4.4 Analysis on Benefit of Development

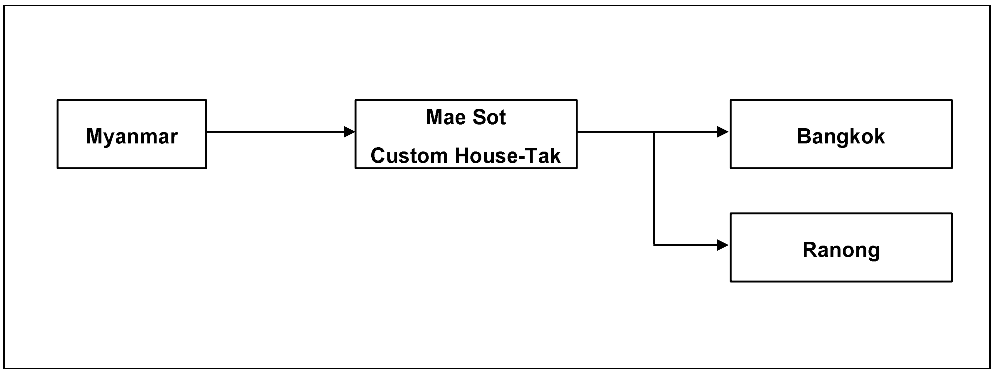
1) Analysis on Feasibility of Project to the Area Development of Network and Linkage between Thailand and Southern China

The analysis in this part is the evaluation on the efficiency of the project and the linkage between Thailand and the Southern China through the selection of important goods in the cross border trade. The selected goods are the seafood imported from Myanmar through the Mae Sot custom house, Tak Province. The seafood can be processed or be frozen for export to the Southern China since they are high potential goods. The convenience in transport will reduce the travel time of transport by cooling trucks for the following reasons.

(1) Thailand is specialized in production and exporting of seafood.
(2) There are possibilities in importing raw materials from Myanmar.
(3) Consumption increased on seafood in China.
(4) Competition in the markets
(5) Support from the government

2) Analysis of Value Chain of Selected Goods

Seafood is the imported goods from Myanmar passing through the Mae Sot Custom House with high volume. Information from the Department of Customs and the interview with the operators shows that there are two transport routes of the imported seafood. The first route starts from the Mae Sot District, Tak Province having the transport destiny at Bangkok. The second route starts at the same origin but having the destiny at Muang District, Rayong Province, before distributed to other regions of the country (Figure 4-4).

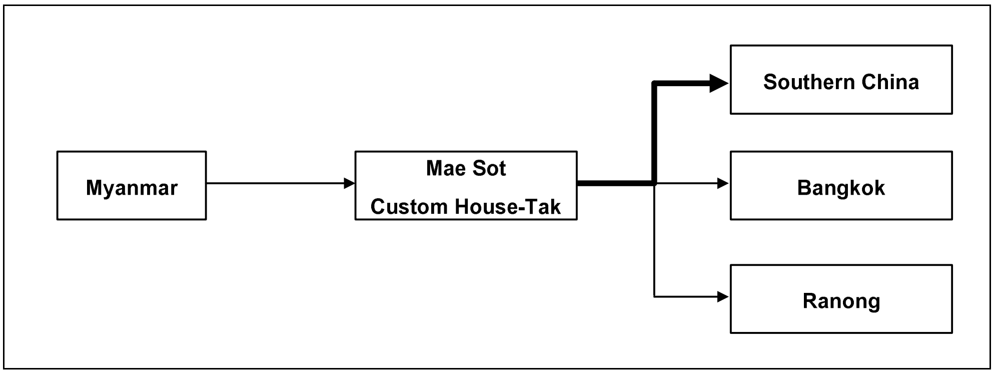


Source: AMP Consultants Ltd.

Figure 4-4 Current Transport Route for Frozen Seafood

At present, the format of transport management of fresh seafood from the survey is the exported seafood from Myanmar through Mae Sot, Tak Province to the processing factories or packaging factoring in the Bangkok and vicinity area with the average distance of 500 kilometers and travel time of 9 hours. The seafood transported on the other route from Mae Sot to the processing factories in Ranong and Ratchaburi with the average distance of 1,100 kilometers and average travel time of 19 hours.

The new trade lane and the promotion to the area economic development in the Northern Region for establishment of seafood processing factories in the area close to the Mae Sot custom house will open more opportunity for exporting of seafood to the Southern China where the population has tendency to consume more of seafood (Figure 4-5). The imported seafood can create economic value added to Thailand through the food preservation processing such as vacuum frozen, or fish ball, canning etc. and packing for easy transport and consumption.



Source: AMP Consultants Ltd.

Figure 4-5 Value Chain Process of Frozen Seafood exported to Southern China

Moreover, processing and packaging of seafood will enable container transport (normally fresh seafood is loaded in closed pails for transport creating accident risk), the new technology of food preservation and the opening of new transport route with shorter distance will enable fast transport of seafood products to the consumers.

To calculate the benefit of the value added obtained from being the exporter of processed seafood to the Southern China, if China has the rate of seafood consumption at 4 kilograms/person/year[2], and the number of the consumers is 20 million persons. The total consumption of the seafood will be 80 million kilograms in the starting year (2009) with the growth rate of consumption of 2% per year, and the value added of the processed seafood is estimated at 2 Baht/kilogram, the total value added from the production to accommodate the demand from the Southern China will be 160 million Baht in the starting year.

However, Thailand still has restriction on the raw materials for production, the fresh seafood, since Thailand already has had the export markets in Europe, the U.S.A., and Japan. The demand in these countries is steady and continuing as well as the domestic consumption of Thailand, The raw materials, therefore, are inadequate for the processing factories in the Central and the Eastern regions of the country and may not be able to accommodate the total demand for Southern China.

To accommodate demand for processed seafood from Southern China, there should be an increase in production capacity through more investment on technology for obtaining fresh seafood and transport from Myanmar, enhancing of processing potentiality, improvement of quality in the production process, including research and development of product innovation in order to gain maximum usage of raw materials, as well as packaging innovations to keep the food fresh.

3) Analysis of the Southern Seaboard Development

The area of the Southern Seaboard on the east side has potentiality for the development of Petrochemical industry and energy due to the comparative advantage of location. The Strategic Energy Land-Bridge (SELB) should be applied for linking of transport and oil business between the Gulf of Thailand and the Andaman Sea.

Transport linkage and petroleum business between the Gulf of Thailand and the Andaman Sea through the SELB route not only creates the business in refining of crude oil but also supports the petrochemical industry and other relating industries since the feed stocks for petrochemical industry are from the petrochemical products.

The evaluation of economic benefit of the development project under the strategy must consider both the value added from the refinery of crude oil and products from the petrochemical industry. The transport of crude oil by pipelines between the Gulf of Thailand and the Andaman Sea to supply to the targeted markets in China, South Korea, and Japan, can create the value added for 1 million barrels/day or 58,035 Million liters/year[3] and the value added in the relating industries for 2 Baht/liter. This makes the opportunity to build up the value added of ***116,070 Million Baht*** in the first year or 1,988,128.45 Million Baht in the period of 30 years. However, the EIRR is 16% based on the requirement of implementation of high investment capital for the construction of oil refinery factory, development of relating petrochemical industry, construction of pipelines, and supporting infrastructure.

[2] Source: Kasikorn Research Center (2007)

[3] 1 barrel = 159 liters

5. Conclusion

The Ministry of Transport has an important mission in bringing out the strength of the country on the comparative advantage of geographic location to support the being of transport Hub of the Region. The economic growth of China and India, the important consumers' markets, are the good opportunities for Thailand to link the new trade lane to the two markets. Coordination of strength and opportunity create potentiality for Thailand in transport linkage with the two countries.

Therefore, OTP has seen the importance of the study for strategic planning for potential linkage of transport network to accommodate the expansion of economic, trade, and investment route.

Realizing the changes in trade and investment formats of the world, the strategic planning emphasizes on the strategy of "Demand derives Supply" to suit the changes in economic environment. The strategies for the formation of programs and projects are:

- Strategy for area economic development that emphasizes the potentiality of linkage of the regions of Thailand and the neighboring countries to create cooperation development under the cooperation frame work, for economic value added, volume, and consumption, to accommodate the linkage of transport among each other.
- The strategy for transport system management is to enhance the efficiency of the transport systems on the transport routes, and the management of the operator network, so that the benefit derived from the management are mostly for the Thai operators due to the production of goods and services on the linked network of the new trade lane.
- The strategy for development of transport system linkage is strategic planning to prioritize the worth-while and suitable usage of the route for maximum benefit.

This study project faces the challenge of bringing out the strength and opportunity of the country to enhance the economic benefit. The strategy, programs and project, therefore, emphasizes on:

- Full efficient utilization of networks of all modes in the country and linking of those markets with high economic, trade, investment, and tourism potentiality.
- Support becoming the center in business, investment, freight transport, and tourism in the Southeast Asia.
- The framework for important implementation of the concerned organizations in the Ministry of Transport for the integrated work to achieve the goals.

However, implementation to achieve the goals is being challenged by the economic crisis of the world today and the rapid change in the future. The implementation has to face with the understanding of the challenging problems as:

- The understanding of the growing markets of trade among each other, especially the export-led country of China that the exchange of trade is the cooperation development for economic linkage to share the benefit in other market while India has the economic development character of export-led. Thailand should find the way to obtain benefit from exporting to the two countries.
- Successful increase in economic benefit requires creation of value added for goods and services in the country, it is urgent to enhance the competitive capability through the human resource development.
- Increased efficiency in management of transport of goods and services and linkage of transport network are essential to support the exchanges of goods and services in the country, among the regions, and internationally. While Thailand is facing the problem of capital restriction for large scale investment, selection of projects and investment periods to support the development and to stimulate the economic system are the important challenges at present.
- Clustering into a single market of countries within ASEAN has a relation to the new trade lane. The government has to use the strength of the country to increase the benefit for Thailand.
- The development of infrastructure in the situation of global warming, the government must be careful about this problem. For example, in transport network development which will effect to natural environment, Government should have a clear policy and provide supported budget for a forest plantation, or, in the case of road extension, tree lines should be developed etc.