LOGISTICS DEVELOPMENT STUDY OF THE GREATER MEKONG SUBREGION NORTH SOUTH ECONOMIC CORRIDOR

Prepared under Asian Development Bank Regional Technical Assistance No. 6310: Development Study of the North-South Economic Corridor. This document is the summarized version of the full study.[1]

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1. INTRODUCTION

1.1 Background

The development of logistics services and communication technologies has revolutionized production and distribution processes, and has created the "global" market. It is within this competitive environment that shippers and consignees require efficient logistics services that can move their goods at the right place, at the right time, in the right condition, and at the right price. It is, therefore, of great importance that regional linkages among neighboring countries are strengthened in the Greater Mekong Subregion[2] (GMS) in order to facilitate trade and develop logistics for better access into the "global" market. This is particularly true for the North South Economic Corridor (NSEC).

The NSEC encompasses three branches: the Kunming-Bangkok; Kunming-Hanoi-Haiphong; and the Nanning-Hanoi transport corridors. The Kunming-Bangkok corridor travels through either Myanmar, Lao People's Democratic Republic or via the Mekong River as Thailand does not share a land border with the People's Republic of China (PRC). The GMS member countries and regions have a shared vision of becoming a prosperous, integrated, and harmonious subregion. To achieve this vision, they have adopted strategies to enhance connectivity, improve competitiveness, and promote a sense of community.

The improving infrastructure, coupled with expanded cross-border cooperation among the GMS countries, will accelerate the process of integrating the subregion's economic corridors into the rest of the world and the "global" market.

The improvement of logistics in the GMS can provide a foundation for further economic integration. However, for many countries in the subregion, inadequate transport infrastructure and high logistics service costs have constrained economic corridor development and integration. A number of major infrastructure investments are already being undertaken by GMS countries and more are planned. Physical connectivity between neighboring countries will be significantly improved upon the completion of these infrastructure investments. The improving infrastructure, coupled with expanded cross-border cooperation among the GMS countries, will accelerate the process of integrating the subregion's economic corridors into the rest of the world and the "global" market.

1.2 Purpose of the paper

The main purpose of this paper is to provide a logistics analysis of the NSEC based on empirical data gathered in the field and to propose possible policy recommendations. The paper will cover the following:

- A definition of transport, logistics, and economic corridors
- Border and transit trade statistics
- The methodology used for logistics analysis
- The logistics analysis of each corridor within the NSEC

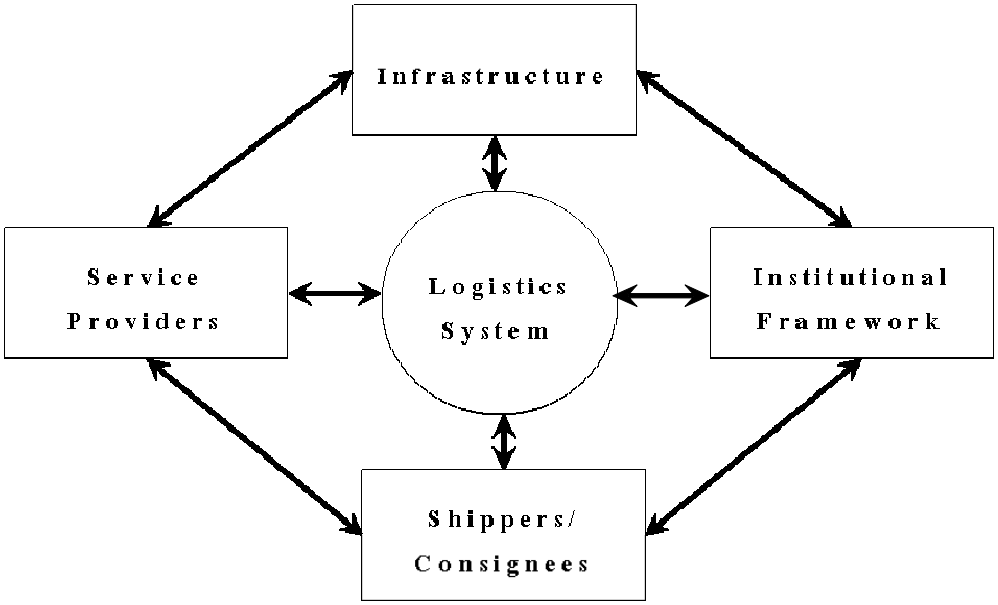
[2] Members of GMS are Cambodia, the People's Republic of China, Lao PDR, Myanmar, Thailand, and Viet Nam.

- Policy recommendations for the logistics development of the NSEC

1.3 Regional logistics system framework

A regional logistics system is composed of (i) shippers, traders, and consignees; (ii) public, private sector logistics and transport service providers; (iii) provincial and national institutions, policies, and rules; and (iv) transport and communications infrastructure. Figure 1 shows how these four components combine to determine the performance of each part of the logistics system within the NSEC which is measured in terms of cost efficiency, responsiveness, reliability, and security. These three performance indicators reflect both on the level of integration of the NSEC logistics system and logistics services capability within the NSEC. The sum of all these factors will determine the competitiveness of NSEC logistics system.

Figure 1: Logistics System Framework



Source: The Author

Logistics development policy is the process of planning, facilitating, implementing, integrating, and controlling the efficient and effective flow and storage of freight, and movement of people and information within and between logistics systems, for the purpose of enhancing traders' competitiveness in order to increase national and/or regional competitive advantage.

2. CORRIDOR DEVELOPMENT

The emergence of different types of corridors as a process is the overlay in time and space of diverse modes to a point where the corridors become the structure of the region. Briefly,

transport corridors will physically link territories or a region, whereas economic corridors will integrate economic activities over territories or a region.

The purpose of a transport corridor is to physically link areas that were not previously connected within a country or a region. A logistics corridor focuses not only on the physical connection but also on how the flow and storage of freight and movement of people is optimized in the corridor, with the support of capable service providers and a facilitating institutional environment provided by relevant agencies.

In a logistics corridor, the institutional framework takes a leading role in the facilitation of movement and storage within the corridor. Border crossings are usually the bottleneck in logistics corridors. However, a logistics corridor is only as efficient and as strong as its weakest link. As such, border crossings must be dealt with from a holistic perspective.

In an economic corridor, economic development will not be solely concentrated in the large cities located along the transport corridor. Investment and economic development will need to go to smaller towns and rural areas along the corridor. Incentives to attract private sector investment need to be reviewed and harmonized between countries along the economic corridor to facilitate economic activities in less developed areas of the corridor. The success of an economic corridor will depend on its ability to attract investments. Attracting investment, in turn, relies on appropriate infrastructure and policies to facilitate the movement of goods and people. Table 1 below provides a description of how these corridors may be characterized in varying stages or levels of corridor development.

Table 1: Corridor development level

Stage	Corridor	Definition
Level 1	Transport Corridor	Corridor that physically links an area or region.
Level 2	Multimodal Transport Corridor	Corridor that physically links an area or region through the integration of various modes of transport.
Level3	Logistics Corridor	Corridor that not only physically links an area or a region but also harmonizes the corridor institutional framework to facilitate the efficient flow and storage of freight, and movement of people and related information.
Level 4	Economic Corridor	Corridor that is able to attract investment and generate economic activities along the less developed areas in the region. Physical linkages and logistics facilitation must be in place in the corridor as a prerequisite.

Source: The Author

3. STATISTICAL ISSUES

Consistent regional trade statistics in terms of weight and volume remain an unachievable goal. Generally, trade data are preserved only in value terms. However, some Customs departments in this region do tabulate transborder flows at individual crossing points in terms of both value and volume. This provides some indication of the volume of regional transborder movement by land.

Cross-border trade in the GMS takes place in two forms: formal and informal. Formal border trade refers to trade transactions conducted through appropriate customs procedures at the border in accordance with rules, regulations, and agreements of the governments involved. Where applicable, customs tariffs are collected. Informal cross-border trade involves transactions that bypass or evade appropriate customs procedures. Informal border trade is significant in this subregion. Unfortunately, no formal report exists on actual cross-border economic activities.

It is also common to encounter inconsistencies when gathering trade statistics from different countries or relevant agencies. There is clearly a need to adopt a platform to define and collect regional and national trade statistics. Harmonized trade statistics, providing not only value but also volume of goods flowing within the NSEC, are necessary in order to provide policy makers with reliable information to formulate appropriate policies that will enhance trade within the NSEC.

4. LOGISTICS CHARACTERISTICS OF THE GMS

The logistics infrastructure in the NSEC is considered adequate for the present volume of freight moving along the corridor. However, this does not mask the reality that infrastructure in certain segments of the NSEC is still lacking, and needs to be upgraded in order to bring all sections up to the same standard that would facilitate the movement of goods and people along the corridor. Table 2 presents an overall assessment of the existing infrastructure in the NSEC.

Table 2: NSEC logistics infrastructure characteristics

	Road	Port	IWT	Airport	Railway
Guangxi (PRC)	Fair/Good	Fair	Fair	Good/Fair	Good
Lao PDR	Fair/Poor	Poor	Fair/Poor	Poor	N/A
Myanmar	Poor	Poor	Fair	Poor	Fair
Thailand	Good	Fair	Fair	Good/Fair	Good
Viet Nam	Fair/Poor	Fair	Fair	Fair	Fair
Yunnan (PRC)	Fair/Good	Fair	Fair	Good/Fair	Good

IWT = inland water transport
Source: Compiled from industry data

5. METHODOLOGY[3]

GMS Cross-Border Transport Agreement

The GMS Cross-Border Agreement (CBTA) is a multilateral legal instrument among the GMS countries (Cambodia, the PRC, Lao PDR, Myanmar, Thailand, and Viet Nam) to allow easier movement of people, goods, and vehicles from one country to another. The CBTA entered into force on 31 December 2003.

In order to formulate adequate logistics development policies, a methodology needed to be developed to describe the current logistics situation in the NSEC. A logistics system scorecard based on the logistics system framework was prepared. This was used as a starting point for determining the data requirements for evaluation purposes. However, the framework may still be too broad to illustrate specific logistics corridor performance. To mitigate this concern, a logistics cost/time distance model has been developed, which includes a facility for measuring perception of reliability when assessing the various branches of the NSEC.

This model is constructed based on a detailed logistical activity map of specific products moving within the different NSEC branches. This model will attempt to describe the cost and time components of movement from origin to destination along routes, as well as to illustrate the delays at borders or other inspection points up to the point of destination.

6. LOGISTICS CORRIDOR ANALYSIS

6.1 Route no. 3: The Bangkok-Kunming expressway

In order to connect Bangkok to Kunming, there are currently three routes linking the two cities:

1) Route no. 3 West (R3W): Bangkok-Chiang Rai-Mai Sai-Keng Tung-Mengla-Menghi-Yunjinghong-Kunming.
2) Bangkok- Chiang Rai-Chiang Saen-Mekong River-Yunjinghong/Kuanlei-Kunming
3) Route no. 3 East (R3E): Bangkok- Chiang Rai-Chiang Khong-Houayxay-Luangnamtha-Boten-Mohan-Kunming

The characteristics of Bangkok-Kunming branch can be summarized as shown in Table 3. At present, the route via the Mekong River is the most utilized route. On the other hand, due to the political situation and the transit fee in Myanmar, the R3W route is never officially used for transit purposes.

Using 2000, 2006, and projected 2015 data, Figures 4 to 9 illustrate how cost and time increase along the three logistics corridors of the Bangkok-Kunming route. Two observations are worth noting: first, the route via the Mekong River has the lowest total cost

3 Banomyong, Ruth. 2007. Logistics Development Study of the North-South Economic Corridor. Paper presented at the series of national workshops in the PRC, Lao PDR, Thailand, and Viet Nam for the Development Study of the NSEC in April and May 2007 and at the Regional Workshop on the Development Study of the NSEC in Bangkok, Thailand on 14-15 May. ADB, Manila.

but takes the longest time; second, the route via Myanmar has the highest perception of uncertainty from a user perspective.

The highest increase in cost and time occurs at border crossings where goods move the least. This clearly shows that transport in itself is not a major impediment. The effectiveness or efficiency of a given corridor is very much dependent on how costly and how quickly borders can be crossed. The full implementation of the GMS Cross Border Transport Agreement (CBTA), therefore, is expected to play a crucial role in the reduction of border crossing cost and time.

The projected 2015 data used in the logistics corridor modelling are based on the full implementation of the CBTA as well as simulated freight prices. The data illustrated in these figures are specifically for para-rubber and the results should be used as illustrative examples of existing issues in the Bangkok-Kunming branch of the NSEC.

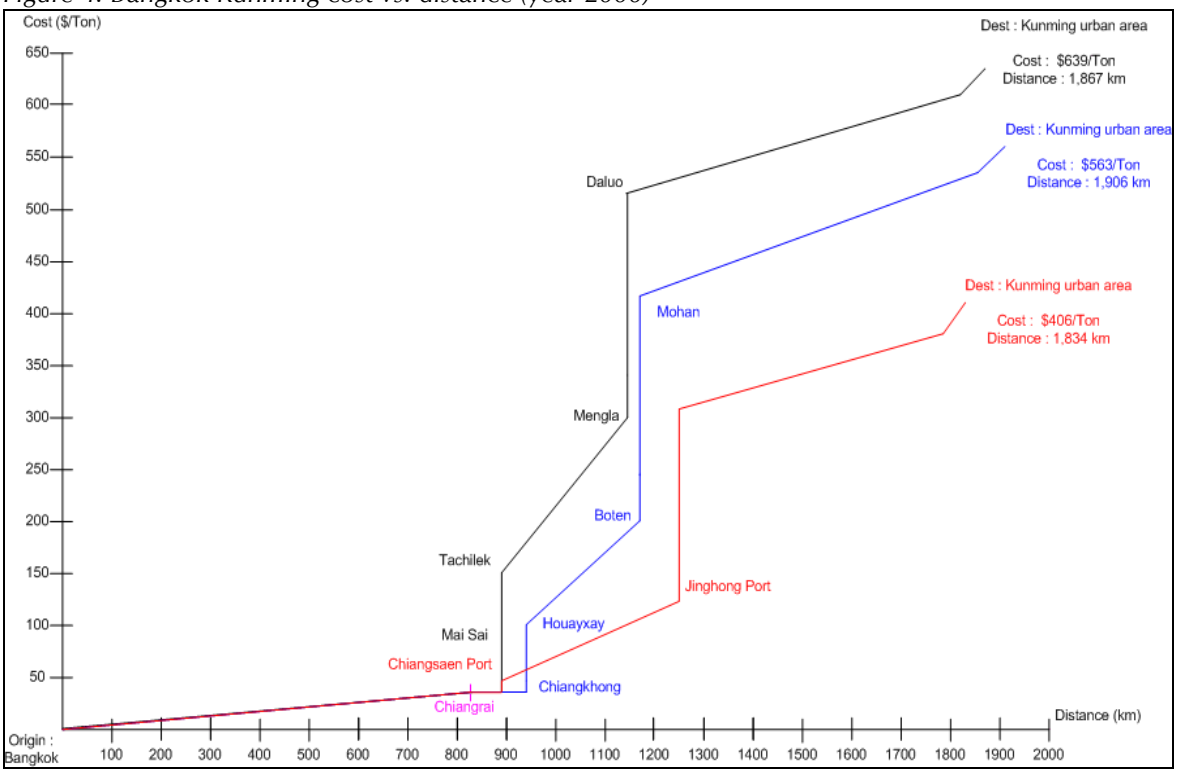
Table 3: Basic Characteristics of Kunming-Bangkok Routes

Logistics Infrastructure		Route Choice (Distance in km)[a]		
		via Myanmar (R3W)	via Mekong River	via Lao PDR (R3E)
Bangkok-Chiang Rai	4-lane highway	830	830	830
Chiang Rai – Mai Sai	4-lane highway	60		
Chiang Rai – Chiang Saen	2-lane highway		60	
Chiang Rai – Chiang Khong	2-lane highway			110
R3W	2-lane highway	253		
Mekong River	Mekong River w/ Port		360	
R3E	2-lane highway			228
R3W/R3: Daluo to Kunming	6-, 4-, and 2-lane highway	674		
R3: Yunjinghong to Kunming	6- and 2-lane highway		534	
R3E/R3: Boten/Mohan to Kunming	6-, 4-, and 2-lane highway			688
		1,817	1,784	1,856

[a]Approximated distances after all ongoing/planned infrastructure investment projects are completed in 2008

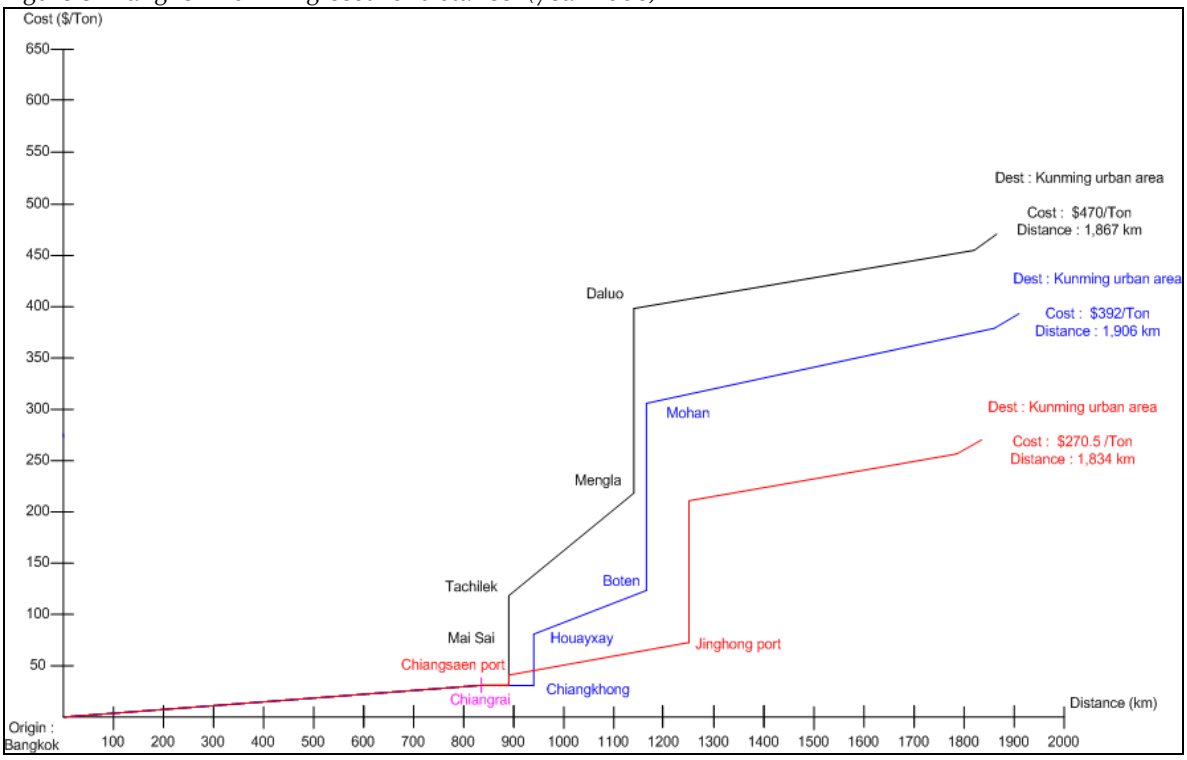
Source: Transport agencies in the PRC, Lao PDR, Myanmar, and Thailand

Figure 4: Bangkok-Kunming cost vs. distance (year 2000)



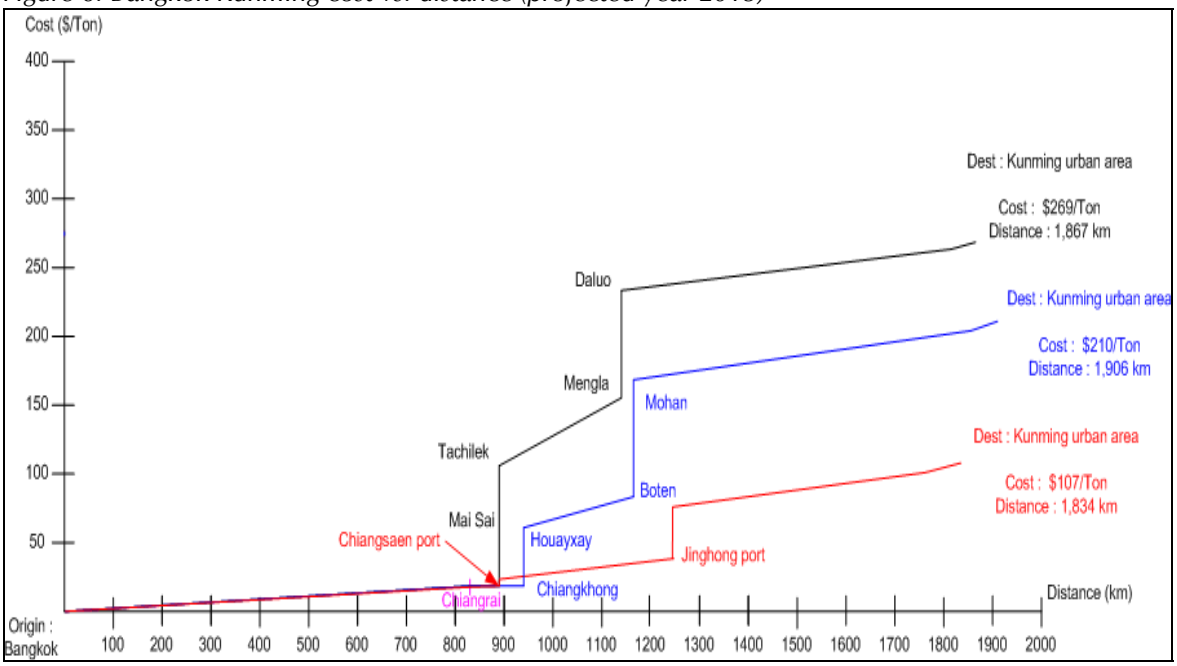
Source: The Author

Figure 5: Bangkok-Kunming cost vs. distance (year 2006)



Source: The Author

Figure 6: Bangkok-Kunming cost vs. distance (projected year 2015)



Source: The Author

Table 4: R3 Cost summary (2006)

Route	Transport & Distribution	Border Crossing & Transit fees	Corridor Cost
R3W	42%	58%	100%
R3E	40%	60%	100%
Via Mekong	Road 32% River 15%	53%	100%

Source: The Author

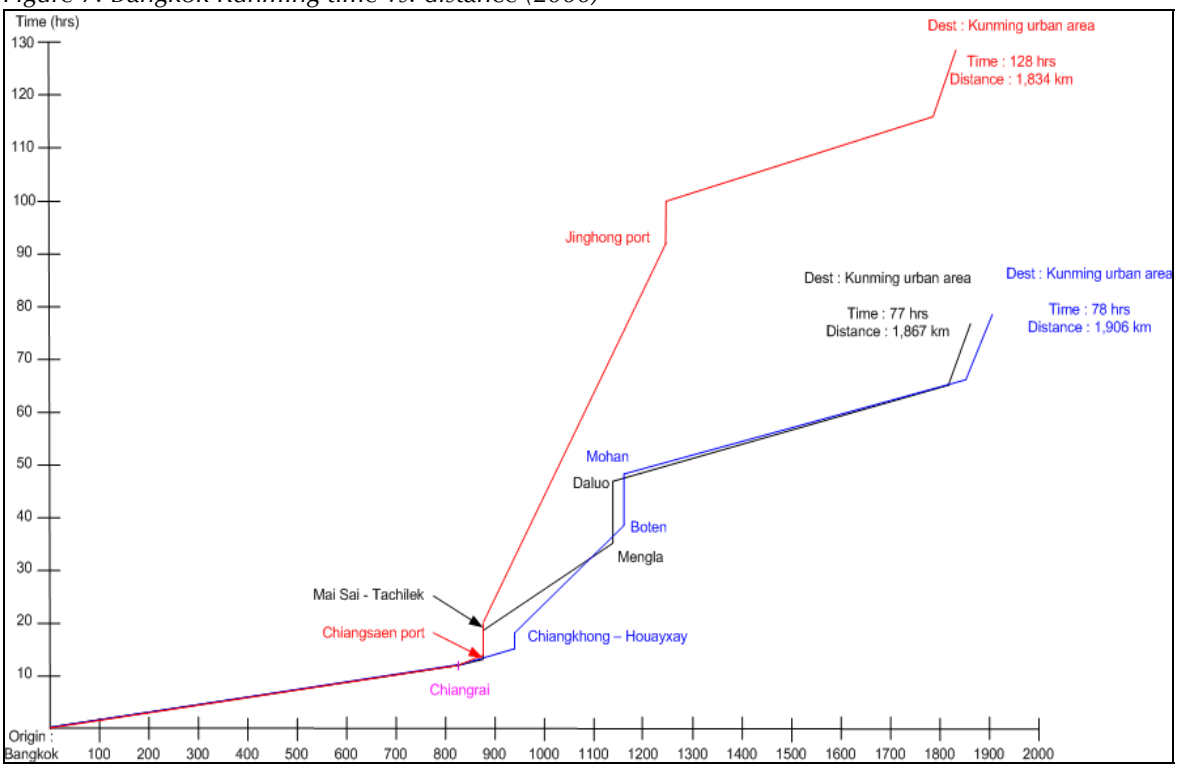
Table 5: R3 Border cost summary (2006)

Route	Border 1 Thailand	Border 2 Myanmar Lao PDR	Border 3 Myanmar Lao PDR	Border 4 PRC	Border Cost
R3W	Mai Sai 1%	Tachilek 33%	Mengla 15%	Daluo 51%	($271/ton) 100%
R3E	Chiangkhong 2%	Houayxay 20%	Boten 18%	Mohan 60%	($232/ton) 100%
Via Mekong	Chiangsaen 3%	N/A	N/A	Jinghong 97%	($141.5/ton) 100%

Source: The Author

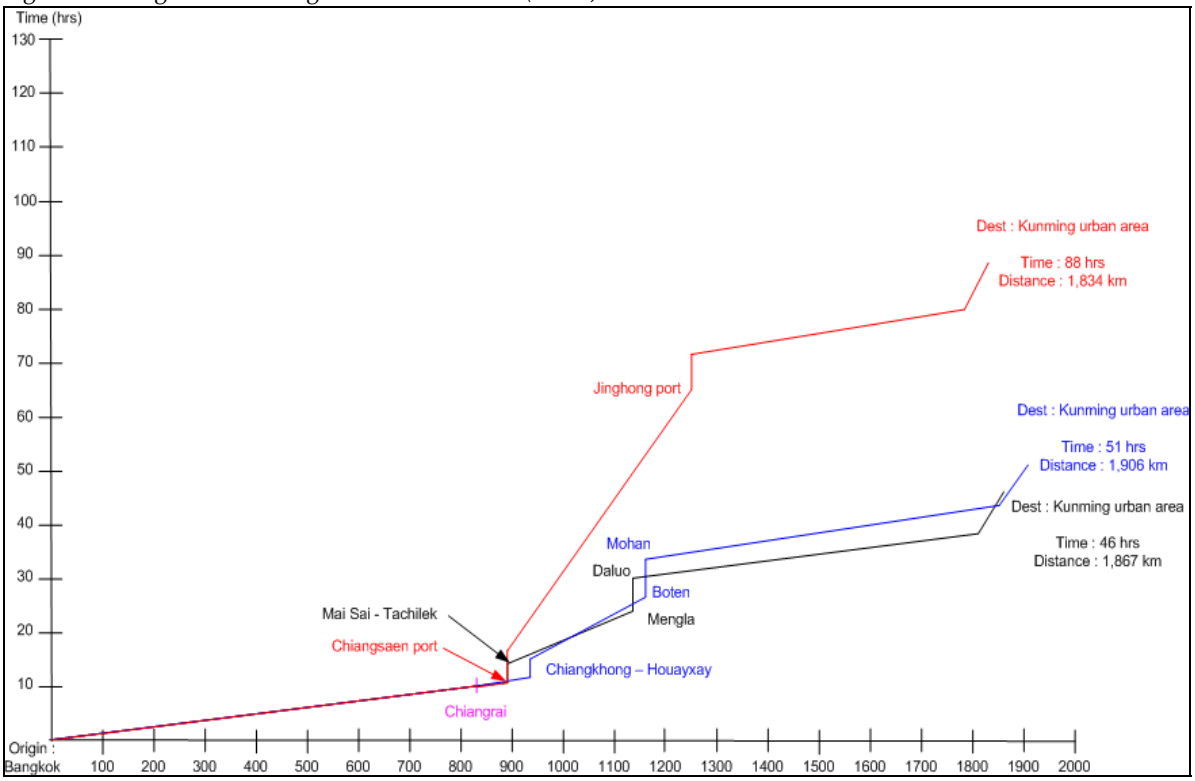
Tables 4 and 5 provide more details on border crossing charges and their ratio compared to total transit and border crossing costs for a shipment of para-rubber in 2006.

Figure 7: Bangkok-Kunming time vs. distance (2000)



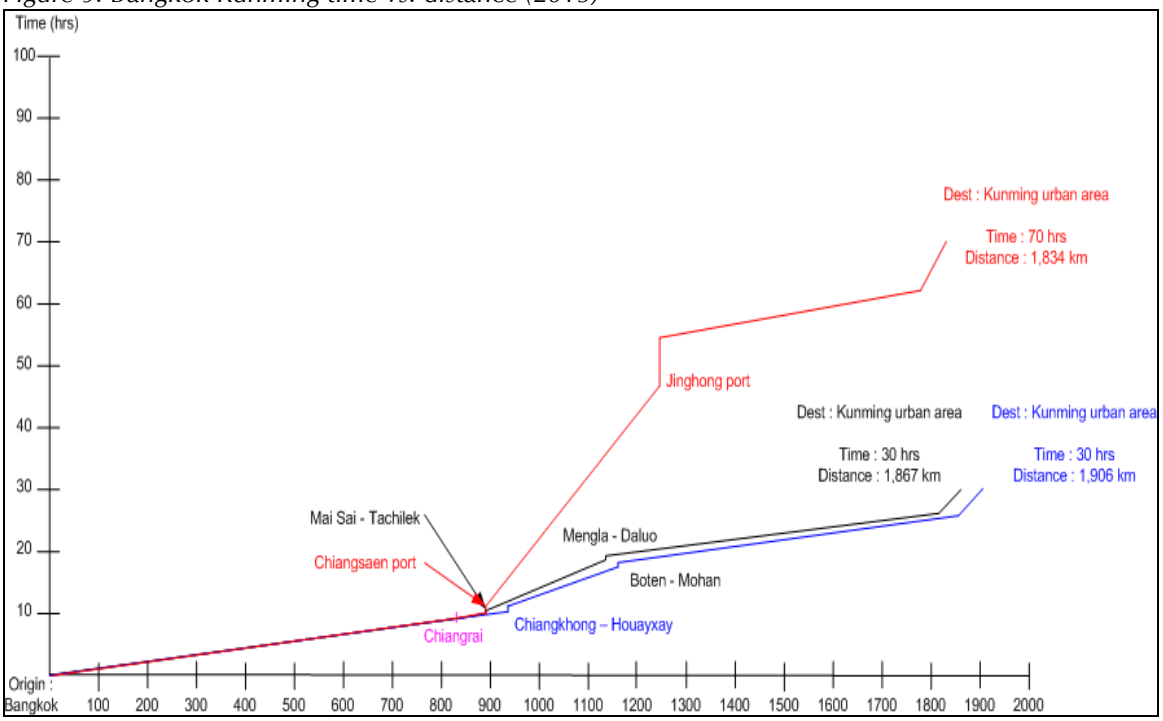
Source: The Author

Figure 8: Bangkok-Kunming time vs. distance (2006)



Source: The Author

Figure 9: Bangkok-Kunming time vs. distance (2015)



Source: The Author

Table 6: R3 Time summary (2006)

Route	Transport & Distribution	Border Crossing	Corridor Time
R3W	80%	20%	100%
R3E	85%	15%	100%
Via Mekong	Road 32% River 54%	14%	100%

Source: The Author

Table 7: R3 Border time summary (2006)

Route	Border 1 Thai	Border 2 Myanmar Lao PDR	Border 3 Myanmar Lao PDR	Border 4 PRC	Border Time
R3W	Mai Sai 12%	Tachilek 22%	Mengla 22%	Daluo 44%	(9 hrs) 100%
R3E	Chiangkhong 12.5%	Houayxay 12.5%	Boten 25%	Mengla 50%	(8 hrs) 100%
Via Mekong	Chiangsaen 46%	N/A	N/A	Jinghong 54%	(13 hrs) 100%

Source: The Author

Tables 6 and 7 provide details on border crossing time and their ratio compared to total transit and border crossing time for a shipment of para-rubber in 2006.

Table 8 illustrates how cost and time trends move for the selected years used in the study. Cost and time decrease and the perception of reliability gradually increases for the three sub-branches of the Bangkok-Kunming branch of the NSEC.

Table 8: Trends on the Bangkok-Kunming corridor

Bangkok-Kunming	$ per ton	Transit Time (hours)	Perception of reliability (based on 5 point scale)
R3W (via Myanmar)			
• 2000	639	77	2.2
• 2006	470	46	3.0
• 2015	269	30	3.5
R3E (via Lao PDR)			
• 2000	563	78	2.6
• 2006	392	51	3.3
• 2015	210	30	4.0
Via Mekong			
• 2000	406	128	2.7
• 2006	270.5	88	3.4
• 2015	107	70	3.7

Source: The Author

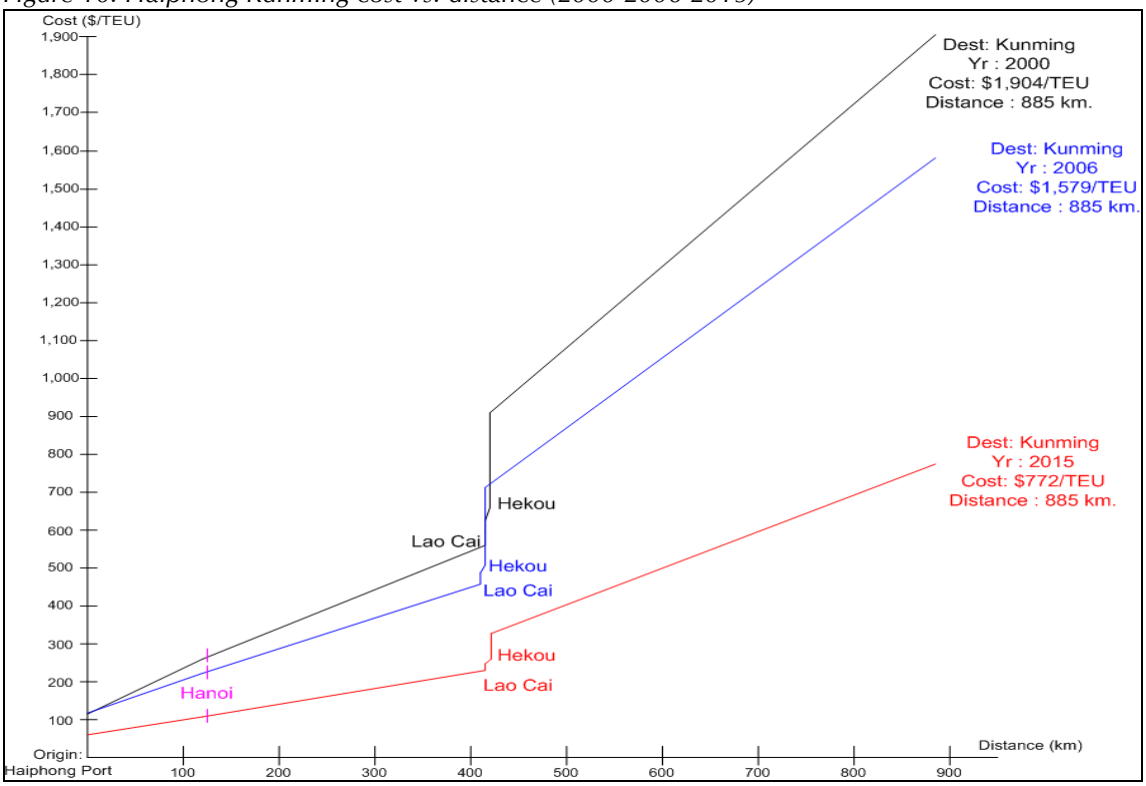
6.2 Haiphong-Kunming

The transport infrastructure in the Haiphong-Kunming branch of the NSEC is currently undergoing rehabilitation but it is expected that the physical linkages will be completed soon. The PRC and Viet Nam have signed an agreement to establish a "one city, two country" arrangement at their border towns at Hekou and Lao Cai. This is expected to provide the impetus for enhanced border cooperation between both countries.

Figures 10 and 11 illustrate how cost and time increase along the Haiphong-Kunming corridor based on 2000, 2006, and projected 2015 data. It is interesting to note that border crossings are again the biggest bottleneck in the efficient movement of goods. This issue is even more critical for goods originating from third countries and transiting via Viet Nam into the PRC.

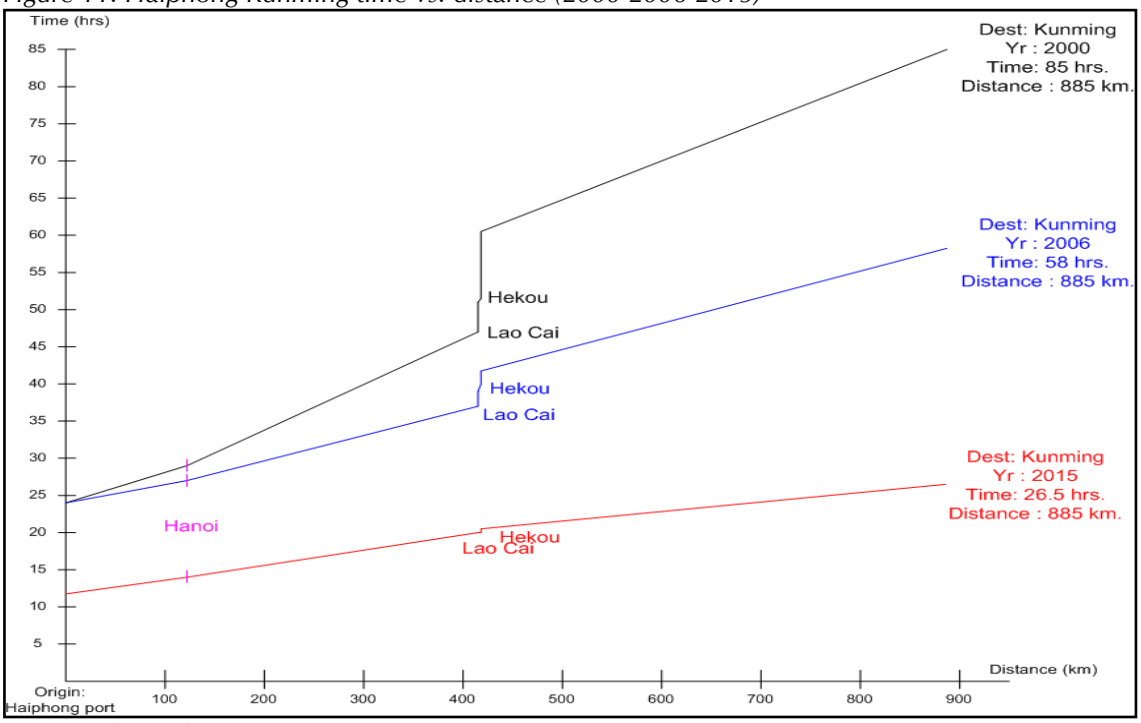
The data utilized in this section are based on the movement of a laden container based on a Freight all kind rate.

Figure 10: Haiphong-Kunming cost vs. distance (2000-2006-2015)



Source: The Author

Figure 11: Haiphong-Kunming time vs. distance (2000-2006-2015)



Source: The Author

Table 9 describes the cost and time breakdown for the Haiphong-Kunming Corridor. Projections show that while transport cost and time ratio are gradually increasing, port and border crossing time is decreasing. Note though that these ratios can be misleading as total corridor cost and time have fallen over the period (See Table 10).

Table 9: Haiphong-Kunming cost and time breakdown

Haiphong-Kunming	Transport cost	Port/Border & Transit fees	Corridor cost	Transport time	Port/Border crossing time	Corridor time
2000	76%	24%	100%	55%	45%	100%
2006	77%	23%	100%	50%	50%	100%
2015	80%	20%	100%	52%	48%	100%

Source: The Author

Table 10 compiles the related information on cost, time, and the perception of reliability on the Haiphong-Kunming corridor for the years 2000, 2006, and projections for 2015. There is a clear indication that transit cost will decrease as well as transit time while users' perception of reliability will increase. Efficient border crossings will become the most critical variable for effecting improvements over this period.

Table 10: Trends in the Haiphong-Kunming corridor

Haiphong-Kunming	$ per ton	Transit time (hours)	Perception of reliability (based on a 5-point scale)
Year 2000	105	85	2.4
Year 2006	87	58	2.7
Year 2015	43	26.5	3.8

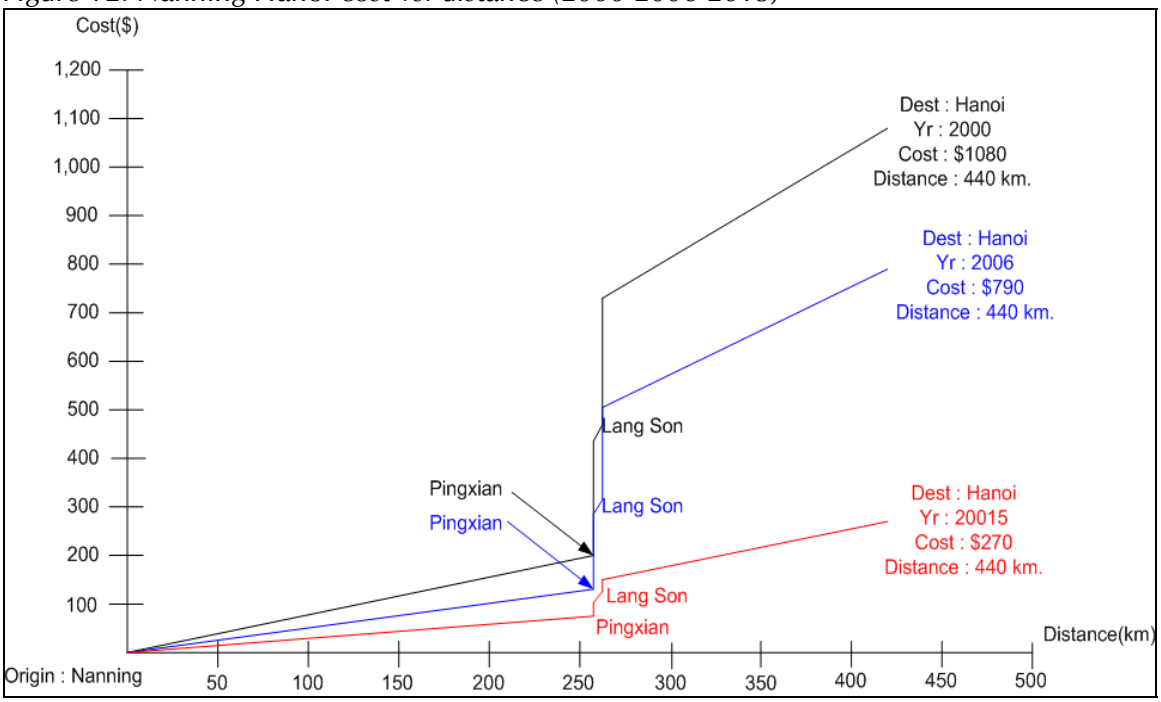
Source: The Author

6.4 Nanning-Hanoi

Most of the traffic at border gates involves trading between Viet Nam and the PRC. Transit trade, such as re-export activities, at Lang Son and Mong Cai to Thailand and Cambodia is still very limited. The 4-lane expressway linking Nanning to Youyiguan has been completed, making it possible to reach the border within 1.5 hours from Nanning. The facilities at the border crossing are under construction and a new Chinese logistics park is undergoing expansion to serve the potential increase in border traffic. With the completion of the road from Lang Son to Hanoi, the only missing link is the physical connection at the border between the two countries. Figures 12 and 13 illustrate the cost and time components of the corridor.

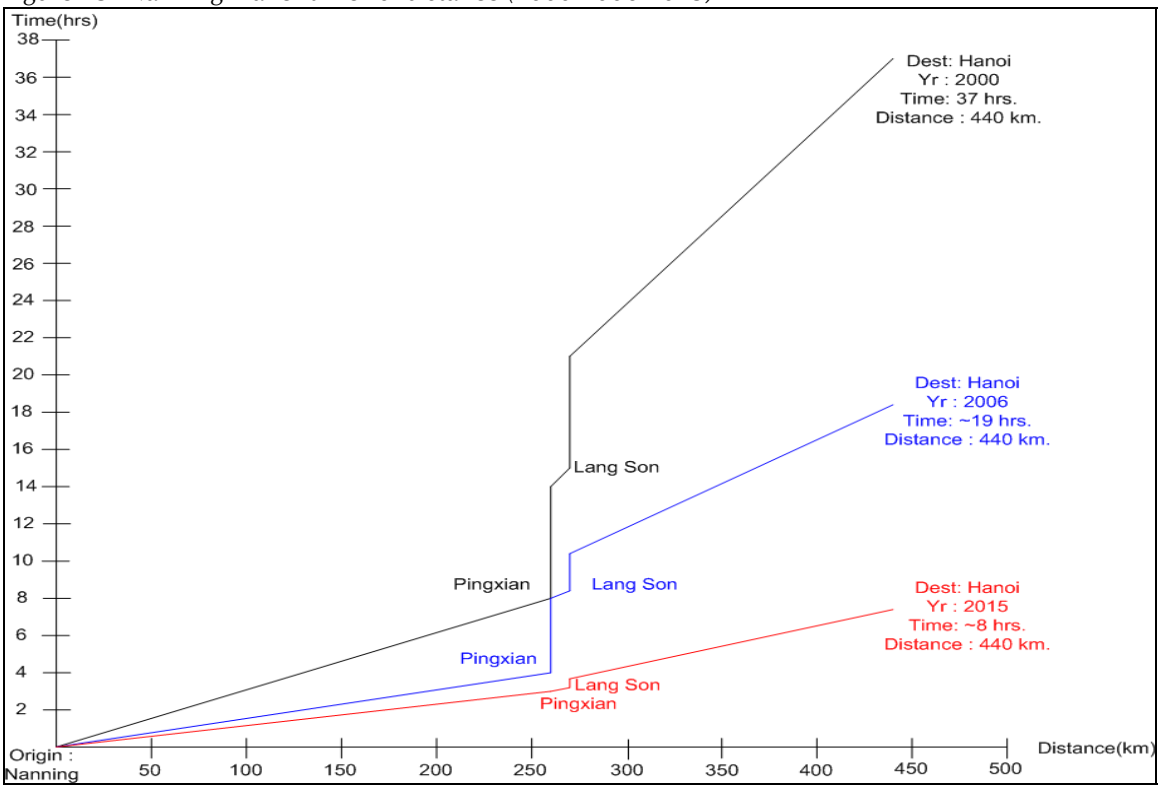
The data utilized for this corridor is based on the movement of a Full Truck Load (FTL) of steel products from Nanning to Hanoi. The FTL of steel is 30 tons.

Figure 12: Nanning-Hanoi cost vs. distance (2000-2006-2015)



Source: The Author

Figure 13: Nanning-Hanoi time vs. distance (2000-2006-2015)



Source: The Author

Table 11 describes the cost and time ratio on the Nanning-Hanoi corridor for the selected years while Table 12 provides the related information on cost, time, and the perception of reliability on the Nanning corridor for these years. There is a clear indication that transit cost will decrease as well as transit time, while the perception of reliability will increase from the perspective of users of the said logistics corridor.

Table 11: Nanning-Hanoi cost and time breakdown

Nanning-Hanoi	Transport cost	Port/Border & Transit fees	Corridor cost	Transport time	Port/Border crossing time	Corridor time
2000	51%	49%	100%	64%	36%	100%
2006	52%	48%	100%	63%	37%	100%
2015	72%	28%	100%	87%	13%	100%

Source: The Author

Table 12: Trends in the Nanning-Hanoi corridor

Nanning-Hanoi	$ per ton	Transit time (hours)	Perception of reliability (based on a 5-point scale)
Year 2000	37	37 hrs	2.4
Year 2006	27	19 hrs	3.0
Year 2015	9	8 hrs	3.8

Source: The Author

7 SUMMARY OF FINDINGS & POLICY DEVELOPMENT

7.1 NSEC Logistics Scorecard Output

Figure 14 provides an assessment of the four components of the NSEC logistics system. The overall assessment of the infrastructure is fair. This means that at present, the physical infrastructure is more or less acceptable compared to the present level of freight. However, there are still discrepancies in terms of infrastructure between NSEC member countries that hinder the physical integration of the NSEC.

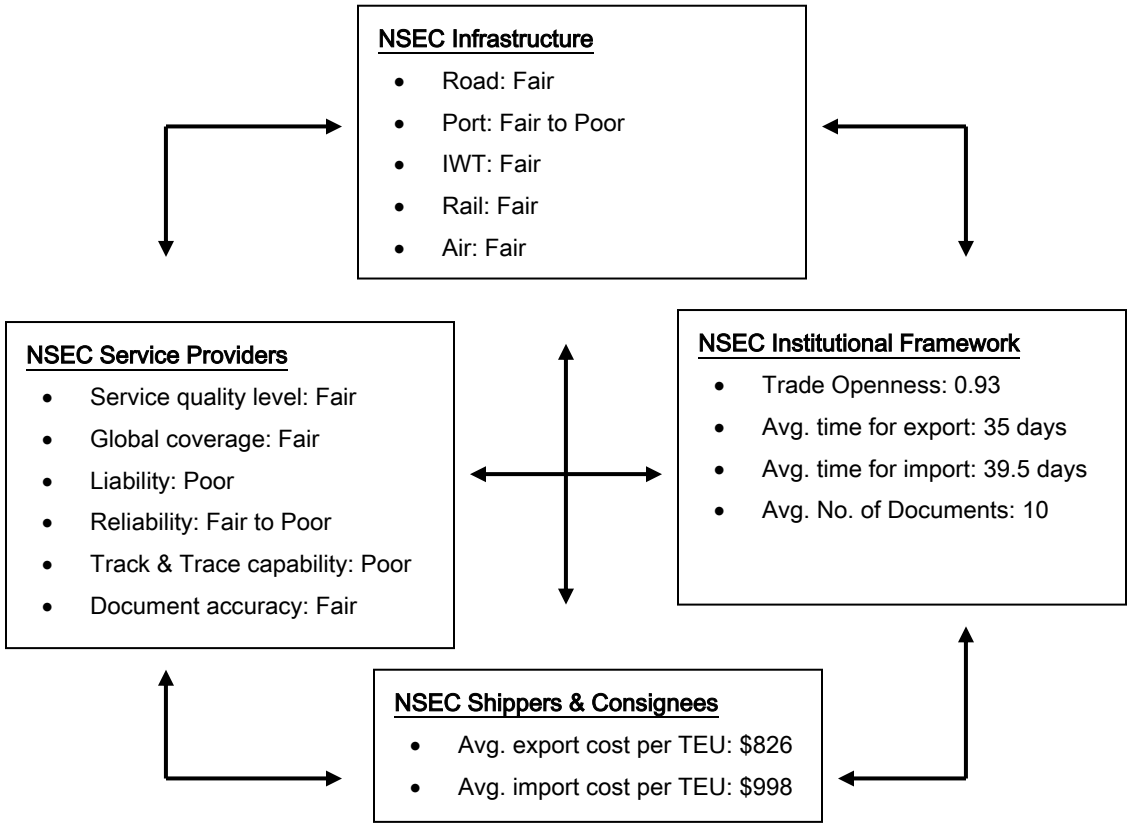
The NSEC institutional framework is still weak with regards to the implementation of trade and transport facilitation measures, such as the CBTA. This is reflected in delays for export and import as well as with the number of required documents for such procedures.

NSEC local logistics service providers are at a disadvantage compared to those of more developed economies. Their rating is between fair to poor. Their biggest issue is the lack of accountability when providing services along the NSEC. Information technology is another hurdle as modern logistics services using high levels of technology are not readily available. However, the competitiveness of local logistics service providers will be based on their operational capability based on local knowledge.

Shippers and consignees are faced with the biggest difficulties. Transport and transit costs are relatively high within the NSEC due to uncertainties involved when crossing borders.

Transit time reliability within the NSEC is again dependent on the state of infrastructure, the institutional framework, and the capability of local logistics service providers to operate effectively in such an environment.

Figure 14: NSEC Macro Logistics Scorecard



Source: The Author

7.2 Corridor Assessment

In the logistics analysis of the NSEC, the infrastructure (hardware) along the corridor is still lacking but improving. Hopefully the infrastructure will be in place and physically connected by 2015. Rules and regulations (software) such as the CBTA are in place but have not been completely implemented. This may require a lot of effort in terms of implementation as some countries are still unable to fulfill their contractual obligations.

Time is of the essence as the infrastructure is moving quicker than required institutional arrangements between countries.

Border crossings are the weakest link in the NSEC corridors and special attention must be made to deal with required border issues. Time is of the essence as the infrastructure is

moving quicker than the institutional arrangements between countries. This may also be a reason why transit trade is currently minimal compared to border trade, though transit can become an important component of trade along the NSEC. Thus, border facilities must not be forgotten as these support the expansion of border trade.

Level assessment conducted on the various branches of the NSEC, based on the proposed classification in Table 1 shows that there is currently no level 4, or economic corridors, in place yet along the NSEC. At present, therefore, the NSEC is still primarily a transport corridor.

Tables 13, 14, and 15 illustrate how the overall level assessment is determined by the weakest link in the corridor. Note though that logistics corridors do exist, but only within the boundary of a country—not at a regional level. However, if border crossings are improved then there is a strong possibility that transport corridors along the NSEC will evolve into logistics corridors.

Table 13: Level assessment of Route no. 3, Bangkok-Kunming

From	To	Level
Bangkok	Chiangrai	3
Chiangrai	Mae Sai	3
Chiangrai	Chiangsaen	3
Chiangrai	Chiangkhong	3
Mae Sai/Tachilek	Mengla/Daluo	1
Daluo	Kunming	3
Chiangsaen	Jinghong	2
Jinghong	Kunming	3
Chiangkhong/Houayxay	Boten/Mohan	1
Mohan	Kunming	3
	Overall level	**1**

Table 14: Level assessment of the Haiphong-Kunming corridor

From	To	Level
Haiphong	Hanoi	3
Hanoi	Lao Cai/Hekou	1
Hekou	Kunming	3
	Overall level	**1**

Table 15: Level assessment of the Nanning-Hanoi corridor

From	To	Level
Nanning	Pingxian	3
Pingxian	Lang Son	1
Lang Son	Hanoi	3
	Overall level	**1**

7.3 Policy Development

Based on the study findings and the regional workshop on NSEC logistics development held in Bangkok on 14-15 May 2007, the following action plan has been agreed upon by NSEC member countries in order to promote the development of logistics in the NSEC. There are two phases that must be completed for the development of the NSEC into a full fledged economic corridor. Phase 1 will help transform the NSEC transport corridor into a logistics corridor, while phase 2 will support the change from logistics corridor to economic corridor. The agreed project concepts for phase 1 are listed in Table 16.

Each proposed project concept is based on specific findings of issues associated with the NSEC logistics development study. Priority should be given to the proposed pilot implementation of trade and transport facilitation measures along Route 3E as the ADB led trade and transport facilitation measures have yet to be fully implemented. Table 16 shows the proposed project concepts classified by the five issues identified in the study as key to the development of logistics in the NSEC.

Table 16: Proposed project relationship with NSEC logistics development issues

NSEC logistics issues	Proposed Project Concepts
Trade & Transport Facilitation	• Pilot implementation of trade and transport facilitation measures along Route 3E • Inclusion of Nanning-Hanoi Corridor in the scope of the CBTA • Expansion of bilateral exchange of traffic rights arrangements along the Kunming-Hanoi-Haiphong road link • Single-window inspection at selected inland ports along the Upper Mekong, including use of ICT, and standardized inspection and documents • Promotion of inter-provincial and district cooperation and coordination mechanisms (logistics facilitation) • Establishment of mechanisms to improve coordination between and among central, provincial, and border officials
Infrastructure Development	• Border towns Development in NSEC Border Areas • Developing road connections from Lao interior districts to Route 3
Infrastructure Maintenance	• Provision of maintenance funds for Mekong River Navigation
Capacity Building	• Developing logistics capacity in the NSEC
Further Development Studies	• Study on the establishment of cross-border logistics centers along the NSEC routes • Study on the establishment of road maintenance fund and traffic management for the NSEC • Study on the establishment of NSEC logistics standard information system