Integrated multimodal transport and logistics: strategy for Vietnam transportation corridors

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Abstract. The transportation and logistics sector is particularly essential as it enables the country to have a competitive supply chain and opens future markets. Unfortunately, Vietnam's multi-modal transport and logistics industry is now still at the rather infancy stage. A large part of the country's logistics network has not been operated in an integrated manner, resulting in a high logistics cost (around 20% GDP), nearly double that of developed nations. Inefficient air and ocean transportation system and a lack of supporting infrastructure on the landside, including warehousing and depot facilities are hampering the growth of efficient logistics practices in the country. Therefore, it has raised the need of conducting research on the master plan of logistics infrastructure development in Vietnam. The paper shall focus on logistics and multi-modal transportation in one strategic transportation corridor of Hanoi – Lao cai as a case study.

Keywords: multi-modal transport, infrastructure development, logistics and multi-modal transport, integrating mode of transport and logistics

1. INTRODUCTION

At the beginning, multimodal transport has been developed in Western Europe, America and then Canada and Asia. In the 1960s and 1970s, though multimodal transport rapidly developed with the "container revolution", it still faced with limitations in technology, organization and especially in regulation among countries and regions. In the 1980s, with the adaptation of the United Nations Convention on the International Multimodal Transport of Goods, there appear several other actors joining in such as national Multimodal Transport Operators, train stations, port authorities, institutes and insurance companies. From that time, there were many conferences and workshops about the development of multimodal transport.

Multimodal transport refers to the transportation of goods by at least two different modes of transport (such as road, rail, air or inland waterway, and short- or deep-sea shipping) as part of the contract where often a multimodal transport operator (MTO) is responsible for the performance of the entire haulage contract from shipping to destination (UN, 1980). The movement of goods could be within one country or international with additional procedures such as goods clearance at customs. With the massive growth in containerisation and the avoidable trend of shifting from the conventional uni-modal to an integrating systematic approach, multi-modal is currently the main common and efficient transport mode used

globally. The transportation method integrates all transport modes' optimisation and organisation into a continuous system aiming at achieving operationally efficient and cost-effective delivery of goods in the supply chain.

A combination of different features of each transport mode normally can solve additional constraints on goods during transportation such as packaging, transportation conditions and storage. On the other hand, multimodal combines the specific advantages of each mode in one voyage, such as the flexibility of road haulage, the relatively large capacity of railways and the lower costs of short/deep-sea transport in the best possible way (Zaheer, 2008). Moreover, in comparison with road transport, which plays a relatively dominant role in the traditional freight transport in Vietnam, several alternative modes of transport, such as rail, inland waterway and short sea shipping, are widely recognised as being less harmful to the environment as well as the social economics benefit in general.

With multiple characteristics of each mode, an added complication is the management of the whole seamless multimodal transportation process which is complex and involves different players such as freight forwarders, third-party logistic service providers, couriers, carriers of different modes of transport, MTOs, rail, sea carriers, port and intermodal terminal operators (Marchet et al., 2009). The communication between these parties has to be precise, timely and costly efficient to ensure the flawless and visible delivery process. Such requirements may be challenging due to different technologies deployed by different companies. The diverse nature of managing the multimodal transport chain is supported by a series of activities, in which each phase needs to be optimised and possibly integrated with other activities for effective and efficient business operations: transportation order handling (delivery schedule, forecasting); prepare the transportation chain (select and contract actor services); prepare transportation (loading, customs); perform transportation (reports on unloading, loading, damage); monitor transportation (track vehicles and drivers′ behaviour); and terminal operations (control loading/unloading, manage stock terminal) (INFOLOG, 1999).

In the fact, it can be seen that logistics service can work only in the region and countries with the sustainable infrastructure, especially transportation infrastructure. Seaport plays a very important role, deciding the development of logistics industry in each country. The seaport is the central point to connect all other domestic transportation modes such as railway, road, inland water way, etc. Transportation is the key in improving the quality of logistics service and competition advantage of manufacturer and exports.

At the same time, logistics industry is the major economic connection going through the whole chain of goods production and distribution. Logistics acts as the essential element to push the economic development at regional seaports, international gate in order to improve the operation capacity and efficiency in the seaport as well as other transportation mode. It can be said that logistics service plays the key role in efficiently operating maritime and other transportation mode.

It is needed to emphasize that modal logistics infrastructure suffers from a number of shortcomings that are currently being addressed through infrastructure investment programs. It is important, however, that these programs must be complemented by "soft" measures that

help ensure optimal use of existing as well as planned infrastructure.

In conclusion, integrating logistics and multi-modal transportation industry must be the focus of such developing country as Vietnam in this century. The logistics development strategy established the need for the integration of the modal development plans both in terms of infrastructure and of service development. This logistics development strategy consequently proposes further initiatives that can help support specific infrastructure development in Vietnam. The question raising now is that how this strategy can be adopted in multi-modal transport with rather limited capacity and investment source.

2. CURRENT STATUS OF STRATEGIC TRANSPORTATION CORRIDORS IN VIETNAM NORTHERN AREA

2.1. Transportation modes in Vietnam

In recent years, transport industry has achieved considerable results in the social development. In the whole country, the transportation service is operated in the network of more than 3.260km of marine, 17.000km of road, more than 3.200km of railway, 42.000km of inland waterway, 55 groups of seaports, 547 bus stations, 20 airports and many international, domestics gates. Freight transportation is mainly covered by transportation modes of road, marine, railway and inland waterway.

In Vietnam, logistics and multimodal transportation service has just been established with the low competition. The industry is rather limited at the rate of 4-6%GDP (World Bank Report 2014). Logistics Performance Index (LPI) of Vietnam is evaluated to be at the rank of 53 (2012), 48 (2014), and 64 (2016). Toggle Rank and Score for Subindicators can be seen in the following table.

Table 1. Vietnam LPI Score and Rank through years

Year	LPI Rank	LPI Score	Custom	Infrastructure	International Shipment	Logistics Competence	Tracking & tracing	Timeliness
2016	64	2.98	2.75	2.7	3.12	2.88	2.84	3.5
2014	48	3.15	2.81	3.11	3.22	3.09	3.19	3.49
2012	53	3	2.65	2.68	3.14	2.68	3.16	3.64

Source: http://lpi.worldbank.org

It can be seen that the main reason of low performance in Vietnam logistics market is the (i) custom procedure, (ii) logistics competence and (iii) infrastructure. Among them, the worst indicator is infrastructure related to commercial and transportation service (seaport, railway, road, information technology) which are not synchronized, in bad connection. Especially, the road capacity is very bad due to congestion and traffic accident. Multi-modal transport does not develop with the unbalance among different modes of transport. The major transport is the road transport with low development, service quality can not compete with regional countries.

There has not yet established considerable logistics hub for goods centers. Inland Container Depot (ICD) have been established all around the country but not enough.

The market shares of Inland Waterway Transport (IWT) and coastal shipping in Vietnam are high, even when compared with that of the road sector. Both sectors are expected to substantially grow further in the future, but other modes, especially roads, are expected to grow faster. While IWT currently serves mainly bulk cargo shippers and captures only a small share of container volumes, experience from Europe suggests that inland waterways, when efficiently connected to ports and roads, can carry higher-value, time-sensitive goods on a more consistent basis. IWT has a fairly strong competitive position for shipments in the 100–300 kilometer length of haul range, with a dominant position for shipments in the 100–200 kilometer range. Coastal shipping, on the other hand, dominates shipments traveling distances of 1,400–1,600 kilometers, which are mostly linked to the trade between the North and South regions. For most other distances, the road sector is the main transport mode.

Vietnam's multimodal transport network, in terms of physical and regulatory infrastructure, is at an early stage of development. Indicators on logistics performance show that Vietnam's logistics costs are relatively high compared to those of some of its regional peers. Efficient handling in ports is a prerequisite for successful competition with other transport modes. The role of (Third Party Logistics (3PLs) is still limited, although numerous players have already entered the market, and their role is growing.

JICA (2009) provides the following assessment of the current state of Vietnamese logistics: There is as yet no multimodal transportation corridor in Vietnam. The need to define improved freight transfers, such as between the road network and ports or airports, between the road network and railway loading bays, or between barge delivery area and trucks is becoming increasingly important.

The reason is mainly institutional. The transportation system is organized by transportation mode, and no single mode is focused on creating "multimodal chains" and "seamless transfers at nodes" that are needed to lower transportation costs.

Inadequate infrastructure has always been cited as the reason for Vietnam's high logistics costs, estimated by some at 25 percent of GDP. This is higher than China, Thailand, or Japan. Accordingly, Vietnam has embarked on aggressive programs to improve ports, road, rail, waterway, and airports infrastructure.

More than these, modern logistics demand a parallel development of the "information and communications highway." Here, one may think of electronic documents and web-portals to share travel information. And yet, logistics cannot wait for the completion of all of these elements before it can be globally competitive.

A multimodal framework is invaluable in identifying bottlenecks and weaknesses across the supply chain. Targeted intervention is the key to improving Vietnam's logistics performance. According to the World Bank 2008 survey on logistics performance, domestic transportation cost is not a main issue. Rather, the poor timeliness of shipments is at fault, which, in turn, leads to higher than needed warehousing and inventory costs. Creating electronic portals that can link the various logistics players (such as freight forwarders, Customs, Truckers, Shippers,

Rail freight companies, Manufacturers, etc.) will be one important intervention. The easing of cross border trade procedures is another, since Vietnam ranked poorly on this dimension compared to other ASEAN countries.

2.2. Strategic corridors in Vietnam

The transport corridor is defined as a set of transport routes parallel with each other, comprising one or more transport modes, bringing about significant impacts on socio-economic development on the area located alongside, and forming arterial system of national transport network in integration with other transport corridors. The transport corridor intends to connect main urban areas and production centers each other with transport modes for trade of goods and visits by people. Therefore, the transport corridor is expected to provide the users with efficient seamless and cost-effective services all the year round.

The role of transport infrastructure in such a corridor is to maintain, strengthen and accelerate the economic growth in relevant economic regions and to keep up the trade competitiveness of the country in particular. Therefore, the development of transport corridor should be planned strategically taking into account the vision for economic growth, narrowing the regional disparity and strengthening the competitiveness and effectiveness of logistics performance.

In JICA (2009), five (5) types of transport corridors in Vietnam have been identified as follows:

(1) **National Backbone Corridor** serves as a major artery to connect NFEZ, CFEZ and SFEZ passing through the country from north to south as a backbone of country's economy and life.

(2) **International Gateway Corridor** serves as a major artery to FEZs for the growth of national economy, and functions as the gateway to and from the international market as well as sources.

(3) Land-bridge Corridor serves as a linkage between Vietnam's major activity centers including FEZs and neighbouring countries, i.e., China with NFEZ, Cambodia and Thailand with SFEZ, and Thailand, Lao PDR and Myanmar with CFEZ.

(4) Regional Corridor serves as a major link branching off from transport hubs to connect and support regional/local production/consumption areas along the corridor.

(5) **Metropolitan Ring Corridor** surrounding Hanoi or HCMC located on both ends of the National Backbone Corridors to connect and to rectify intercity traffic on the intersecting corridors.

Main problems facing with the strategic corridors in Vietnam can be summarized in different aspects as follows:

- Traffic congestions are rather serious with the unbalance of supply and demand side.
- Flooding/drainage, traffic safety and parking are main problems.
- Logistics infrastructure:
  - Freight transportation depends much on road network

- Most of cities suffer from limited capacity of marine ports (if any), inland waterway, railway system and road network
- Lack of modern and advanced logistics infrastructure and facility
- Lack of intermodal transportation system
- 10-60% of urban roads including national, provincial and city roads are in poor surface conditions.
- Road hierarchy is unclear in many cities. In some cities, urban and inter-city traffic are mixed in urban areas
- Maintenance is lacking in all cities.

– Communication network and IT application:
  - Internet and communication network has been developed in almost MSCs
  - Most of enterprises combine IT and manual measurements in logistics management system. The highest ratio of IT application is in the field of order management.
– Resettlement is becoming increasingly a serious concern.
– Funding is insufficient and unstable for infrastructure development.

2.3. The corridor of Hanoi – Lao cai: Issues and challenges

Hanoi – Lao cai corridor belongs to group 3, acting as an important link in the freight flow of Hanoi – Haiphong/Quang ninh – Lao cai – Kun Ming.

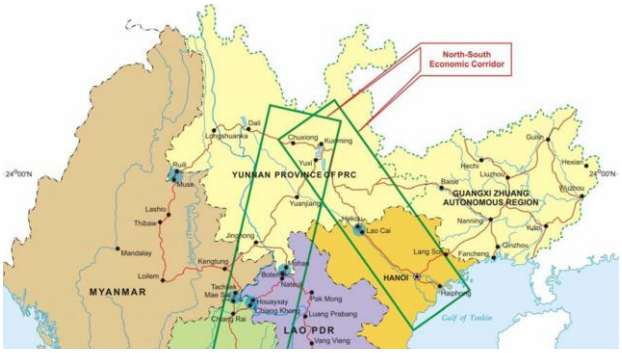


Figure 1. Hanoi – Lao cai corridor

Source: Modified from Okazaki Yuji (2007)

This corridor includes 5 provinces (Hanoi, Vinh Phuc, Phu Tho, Yen Bai and Lao Cai) and its length is around 260 km from the Hanoi Outer Ring Corridor stretching north-west up to China border. Due to the accession to the World Trade Organization (WTO) by both countries the cross-border trade has been increasing rapidly in terms of both passenger and freight traffic. Because of the policy change of Chinese Government with respect to the overseas travel permit to Chinese citizen, the number of Chinese travelers has been rapidly increasing since 10 years ago. The topography is generally moderate along the Hong River valley, but the road gradient is partially steep on the hilly area surrounded by mountains. This corridor forms a part of Asian Highway Network as well as the Kunming Singapore Railway Link. To improve this international corridor, various infrastructure projects are promoted led mainly by ADB.

The total population in the influence area of this transport corridor is around 7.5 million as of

2016 and is forecasted to grow to 10 million in 2030. The average growth rate of GRDP in the past 10 years was around 14%, which is rather higher than the national average.

The main modes of transport of this corridor are road (NH2 and NH70) and railway, though the Hong River is sometimes used for inland water transport. The road and the railway are situated in parallel with a certain distance apart from each other. The corridor itself is straight forward with a few intersecting roads.

The cross-sectional traffic of all modes at present is about 6-34 thousand passengers/day and 9-31 thousand tons/day for passenger and freight, respectively. The demand obviously becomes small near the China border. Passenger traffic is shouldered by bus, car and railway, while freight traffic depends on truck and railway at present. In this corridor, the use of railway is intense both for passenger and freight transport, almost comparable to that of the North-South Coastal Corridor.

The condition of the roads of this corridor needs improvement. 40% of NH2 is in “bad” condition, and NH70 is further worse with 35% in “very bad” and 20% in “bad” condition. In contrast, the bridges are relatively well maintained. Road structure should be strengthened.

The railway is relatively well maintained reflecting probably the intense use at present. Speed restriction on the bridges is only up to 30km/h, which is better than the Hanoi-Saigon line. However, the railway faces a major problem in relation to alignment. Since the track is on the slope along the river, it is often damaged by landslides and soil erosion. If drastic measures are required for capacity expansion, realignment should be seriously considered.

Inland waterway of this corridor is designated by VIWA’s master plan as “Core Axis”. The expected role is to transport bulky cargoes such as apatite, phosphate, coal and cement. To do this, the current water channel needs a considerable improvement to a width of 50m and a depth of 1.5m at least.

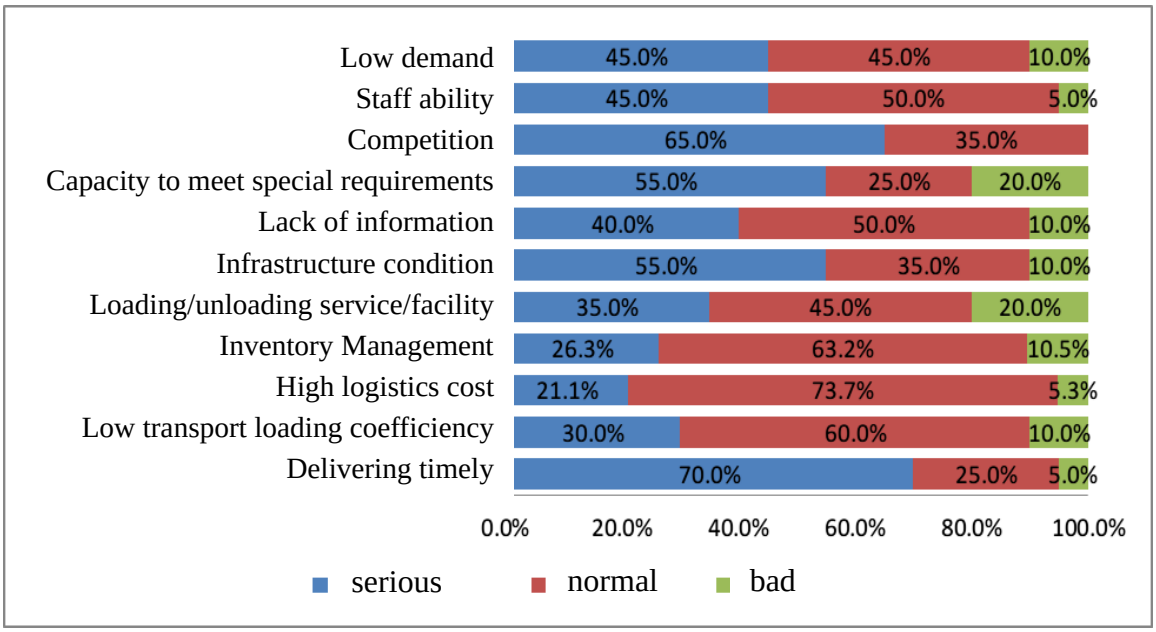
At present the container traffic of this corridor is limited because of a lack of container handling equipment at freight stations and rolling stock needed for container transport.

In terms of geography, this corridor run through a mountainous area. In the hilly/mountainous part of this corridor, special attention is required for soil erosion and possible earthquakes.

Logistics service in recent years have sufficiently served business and export & import activities in Hanoi and NFEZ provinces. However, logistics industry still face a lot of problems. The research has developed a survey in 278 enterprises, including logistics providers and customers.

During the survey, logistics providers pointed out problems in supplying the service in the selected corridors. Some criteria have been evaluated as “serious”, for example “delivering timely and correctly as request” (70% respondents), competition with other companies (65%), and infrastructure condition (55%).

Figure 2: Problems and challenges of logistics providers



The main reason leads to the problem of goods delivering is the transport infrastructure. The survey also focused in evaluating the transport infrastructure from logistics providers. The respondents evaluated the challenges by grading from 1 ("very serious") to 5 ("no problem"). The following table shows the results.

Table 2: Challenges in transport operation

Items	Average Grade
a. Geographic road design	1,54
b. Road conditions (e.g. pavement,…)	1,53
c. Traffic condition (congestion)	1,47
d. Loading/unloading condition, facility	2,9
e. Parking	2,19
f. Road and other fees	1,49
g. Operation license	2,31
h. Fees for operation license	2,83
i. Fee adjustment	2,89
j. Competition	1,57
k. Cost for new vehicles	1,57
l. Cost for purchasing materials, accessories, v.v...	2,97
m. Maintenance service quality	2,85
n. Driver	2,25
o. Low demand	2,14
p. Police enforcement	1,57
q. Other: ……	

Logistics customers have been asked for their satisfaction when using outsourcing

services (with the grades from 1 (“very unsatisfied”) to 5 (“very unsatisfied”)). The following table shows the results of evaluating logistics service provided by enterprises:

Table 3: Satisfaction of enterprises when using outsourcing logistics

Item	Average Grade
a. International transportation	
- Maritime	3,79
- Airlines	3,45
- Road	3,37
- Railway	3
- Inland waterway	3,21
b. Domestics transportation	
- Maritime	3,49
- Airlines	3,48
- Road	3,52
- Railway	3,03
- Inland waterway	3,11
c. Other Logistics services	
- Customer agents	3,28
- Warehousing service	3,36
- Inventory/distribution center service	3,43
- Freighforward service with shippers/airlines agents	3,48
- Payment service	3,29
- Service of transport planning, inventory management, goods order management	3,2
- Other goods services (packaging, labelling, consolidating,…)	3,16
- Procedure for C/O, quality assurance…	2,88

It can be seen that logistics services related to railway, inland waterway are evaluated as the services with lowest satisfation from customers.

3. STRATEGY SOLUTIONS FOR INTEGRATED MULTIMODAL TRANSPORT AND LOGISTICS IN THE CORRIDOR

3.1 Best practice and lessons learned

According to UNESCAP (1997), in some part of the world, trade data is preserved only in monetary terms. Another difficulty that has challenged many researchers is the variety of trade forms. Especially in cross border trades, where several forms of trade are generally undertaken informally. In a formal trade, transactions are conducted through proper customs procedures under government

rules, regulations and supervision, whereas informal trade involves transactions that may bypass or evade these procedures.

In Vietnam, choice of domestics transport is rather limited due to lack of infrastructural

connectivity and services. Other types of inland transport, such as rail and IWT cannot compete with road haulage in terms of cost and flexibility. From the above-mentioned fact, Vietnam IWT network has been operated inefficiently despite of total length. The same situation can be seen in the railway industry, especially in the case that Vietnam Railway is a monopoly enterprise working in the field with a low-tech, unsafe services in a bad quality. As a result, rail is not widely used for either passengers or freight. With the current climate of global trade competition, it is obvious that the challenges in logistics and transport cost reduction could just be overcome through integration of Multimodal Transport operation. An assessment of SEA transport infrastructure reliability is presented in the following table.

Table 4. Assessment of SEA Transport Infrastructure Reliability

	Road	Port	IWT	Railway
Laos	Fair/Poor	Poor	Fair/Poor	N/A
Myanmar	Poor	Poor	Fair	Fair
Thailand	Good	Fair	Fair	Good
Vietnam	Fair/Poor	Fair	Fair	Fair

Source: Adapted from Banomyong (2007)

With flexibility of mode choice, the implementation of Multimodal Transport will have a direct impact in reducing trade barriers. Especially within a developing country, Multimodal Transport enables economies-of-scale within a transport system to be gained through productive configurations of mode flexibility (Banomyong and Beresford, 2001).

As a component of international trade, Multimodal Transport has generated considerable commercial values for shippers in comparison to other alternative transport systems. According to

Campisi and Gastaldi (1996), Banomyong (2000), SLA (2008), and Islam, *et al.* (2008), some of its many advantages are:

- Reduction of time, risk of lost or damaged goods through a planned and coordinated single transport operation,
- The establishment of a seamless communication link maintained by single Multimodal Transport Operator,
- Increase market access opportunity through speedy transfer and transit time,
- Reduction of multiple documentation,
- Cost saving through possible reduction of freight rate,
- Minimising confusion through a single point of contact (the Multimodal Transport Operator),
- Ultimately, an improvement in the competitive position of companies in the international market place,
- Different solutions can be easily benchmarked for performance, and
- Reduction in energy used, thus provides environmental and social benefits.

According to these inherent benefits, it is clear that Multimodal Transport has the potential in providing numerous commercial advantages for shippers, consignees and freight forwarders. Needless to say, it is an integrating tool in offering shippers a great choice of cost control,

flexibility, competition, reliability and a one-stop service (Islam *et al.* 2005).

In the context of international transport operations, classic measures of generic trade-off variables have been widely applied in several academic studies with regard to Multimodal Transport corridors. For example, Banomyong and Beresford (2001) presented routeing options from Vientiane (Lao PDR) to Rotterdam (Netherlands) using the Beresford Cost Model which presented the trade-offs between commercial factors such as cost, time and distance. Similarly in Banomyong (2004), various international routeings from Lao PDR to Marseilles (France) are presented under the Multimodal Transport operation concept. It is worth noting that for landlocked countries such as Lao PDR or Mongolia, a Multimodal Transport network can be readily used in the implementation of efficient freight movement solutions (Banomyong and Beresford, 2001; Beresford, *et al.* 2007).

Other than international corridors (i.e. Europe to Asia or Europe to Africa), regional Multimodal Transport corridors in areas such as Pacific Asia, Europe and Southeast Asia are also found in the literature. For example, in the work of Rodrigue (1996), he focused on the feasibility of running Multimodal Transport systems in the Pacific Asia region (Thailand, Japan, South Korea, Taiwan, Indonesia, Singapore and Malaysia). He found that an uneven distribution of economic and transport activities exists along the corridors, which had led to inequalities of competitive advantage and thus affects economic productivity. Nevertheless, when dealing with Multimodal Transport, it should be recognised by implication as 'international' in nature, and it must cater for these inequalities.

3.2. Strategy for integrating multi-modal transport and logistics in the selected corridor

In terms of logistics development initiatives, Vietnam has a rather ideal geographical position (connection point from inland to the sea) to establish a world-class logistics system. From that perspective, two main objectives have been put forward:

(i) To enhance trade facilitation with the aim of increasing cost efficiency, customer responsiveness and reliability and security.

(ii) To create added value for the logistics and other supporting industries.

Despite the level of the logistics development initiatives, key considerations of both objectives strongly reflect the shippers' need to elevate their performance in the current competitive global market. The aim of increasing cost efficiency, customer responsiveness and reliability, security and value are, with slight variation, embedded in the core of all shippers' business strategies. These two objectives are divided into five logistics develop strategies, which are: (i) business logistics improvement, (ii) transport and logistics network optimisation, (iii) logistics service internationalisation, (iv) trade facilitation enhancement and (v) capacity building.

The importance of cost and time reduction, understanding of logistics, value and efficiency, highlighted by the government, are at heart, socially and economically desirable in all transport and trade-related activities (Melumad and Ziv, 2004).

In terms of transport development, issues related to optimisation have been frequently discussed. According to NESDB (2007), key transport and logistics network optimisation

objectives have been ambitiously laid out to accelerate trade and transport operation efficiencies. These objectives are:

(i) To save energy,

(ii) To integrate multimodal networks and

(iii) To build seamless connectivity.

The potential strength of these transport and logistics development initiatives lies primarily in the possibility that the government could offer in confronting the concerns and interest of shippers. So far, road haulage has always been the dominant mode of transport in Vietnam. However, this has always been an inevitable bottleneck in an attempt to lower overall transport cost. In order to minimise the dependency of road transport, three key development initiatives has been geared to promote other transport mode types (eg. railway and waterway transport) and to increase regional connectivity.

The study is the basement for the government to take into consideration and make decision on plans and projects to develop logistics industry in the corridor, aiming at:

- Establishing the chain of logistics services in the Northern Economics Focal Zone, with the selected corridor of Hanoi (Hai phong/Quang Ninh)-Lao Cai-Kunming acting as the backbone strategic corridor of multimodal transportation;
- Vietnam NEFZ plays an important role as the gate of logistics chain into ASEAN and APEC countries;
- Developing a comprehensive and inter-connection logistics network for Hanoi and surrounding area.

From such analysis, it is proposed the strategic target for the government to develop the regional connectivity to enhance the capacity of multimodal transportation in the selected corridor. The main objective cargo to be focused within the logistics system shall be importing and transition cargo (in both directions) through seaports, railway, road and airline, aiming at container.

Full integrated logistics and multimodal transportation services shall be standardized with the following requirements:

- Standardizing the procedures and processes of freight forwarding, transportation and logistics
- Logistics centers can fully connect with (multimodal) transportation infrastructure (network).
- Standardizing technology in logistics and multi-modal transport, aiming at good access to major transportation terminals (eg. main seaports (Hai phong/Quang ninh), airports (Hanoi) and railway stations (Ha noi, Hai phong and Lao cai)).
- Attracting high volume of export-import containers.
- Providing new (value-added) logistics services.
- Efficient customs service (electronics);
- Gathering customers with the high demand for 3PL service (FDI and industrial zone enterprises): standardizing the perception and choice behavior of enterprises (in both sides of logistics service suppliers and customers)

4. CONCLUSION AND RECOMMENDATION

From the study, it can be concluded that the logistics performance of Vietnam is not comparable to its potential. Main issues facing with logistics and multi-modal transport can be mentioned as:

- Accelerating urbanization requires sustainable and balanced urban/regional development;
- Big gaps in planning and management capacity;
- Logistics infrastructure limitation and low capacity, quality;
- Inappropriate management and operation in logistics enterprises.
- Low capacity in both government and local management, as well as service providers

The strategy and solutions in developing logistics and multi-modal transportation infrastructure lead to the following lessons learned for strategic corridors:

- Developing the integrating model for logistics and multi-modal transportation service is essential in the current context;
- The highest priority is standardizing and integrating the system of multi-modal transport and logistics services in terms of (i) connecting and intergrating technical infrastructure; (ii) logistics and transportation technology standardized with countries in the selected corridor; (iii) capacity of supplying and using logistics services of enterprises.
- Other elements needed in developing the logistics and multi-modal transport shall be:
  - Conducting the master plan of logistics infrastructure with the support from inter-connecting transportation network (national and regional).
  - Developing logistics centers/parks at regional and local areas.
  - Developing communication network and IT application, improving logistics service.
  - Enhancing capacity from authority, management to enterprises operating in the logistics field
  - Controlling the process of master planning and implementation
  - Developing convenient conditions for private section to invest into constructing and operating logistics and multi-modal transport infrastructure.

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