



“A Passage Across Borders for People”

The Research on Cross-Border Transportation Infrastructure

This paper summarizes the results of the Research on Cross-Border Transport Infrastructure conducted by the Social Development Department of JICA.

Technical Advisers:

Professor Tsuneaki YOSHIDA, PhD
The University of Tokyo, Graduate School of Frontier Sciences,
Department of International Studies

Research group:

Yuji OKAZAKI, Nobuhiro KOYAMA, Hozumi KATSUTA
Akira NAKAMURA, Yoshiro KURASHINA, Phan Le Binh
Shigeo HONZU, Naomichi MUROOKA, Naofumi YAMAMURA
Shirohi ISOGAI, Tamaoki WATANABE

(Social Development Department, JICA)

Yukihiro KOIZUMI

(Regional Department I (Southeast Asia), JICA)

Consultant:

Mitsubishi Research Institute, Inc.
Hiroshi MORI, Yoichi SAKURADA, Satoshi YOKOYAMA, Kunio HATANAKA, Mikio Okano



What is Cross-Border Transportation Infrastructure?

Background and expectations

Cross-Border Transportation (CBT) is transportation across international boundaries and Cross-Border Transportation Infrastructure (CBTI) is the basic infrastructure that allows and facilitates CBT.

Obvious examples are international ports and airports and international bridges such as the Mekong Friendship Bridge. In addition, CBTI also include the transportation network that links to these facilities as well as the software aspects of its operation.

CBTI supports the progressing global trend of regionalization through lowering of barriers (physical and non-physical) that prevent or hinder the smooth and cost-efficient movement of people and goods (i.e. CBT) thereby promoting economic interaction among nations in the region.

Regionalization promotes regional development and

is considered to reduce poverty and foster stability in the region.



Picture: Mekong Friendship Bridge over the Mekong River linking Nong Khal (Thailand) and Vientiane (Lao PDR)

Elements of CBTI

The scope of CBTI extends over a wide-ranging area including systems/standards and operation/management in addition to the physical infrastructure such as hubs (e.g. border crossings and transshipment facilities).

The focus tends to be on the hardware components, but the software components are just as important to allow trade and traffic in both directions possible.

Elements and description of CBTI

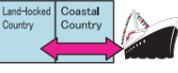
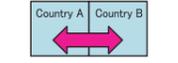
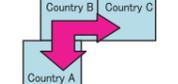
Element	Description
Mode of transportation/facilities	Transportation facilities (e.g. roads and ports) and mode of transportation (e.g. railways)
Hub facilities	Cross-Border facilities and transshipment facilities that transportation passes through.
Systems/standards	Establishment of various systems (e.g. immigration System and organization framework)
Operation/management	Operation and management of mode of transportation, facilities, and hub facilities.

Purpose and Needs for the CBTI

The purpose and impacts of CBTI vary based on the structure and level of sophistication of interaction among stakeholder nations, which basically can be categorized into three types as follows:

- 1 For land-locked countries with no coastline to link with a coastal neighbor country for maritime transportation access
- 2 For two adjacent countries to link themselves so they can complement each other in terms of resources, workforce and consumers for economic development based on partnership
- 3 For multi-country linkages to enhance transportation among them to achieve regional economic development

Needs for CBTI

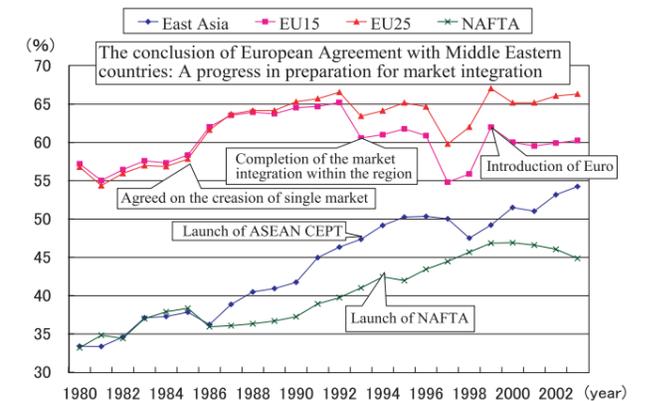
Types of Needs	Purposes and impacts	Examples
Connection between land-locked areas and sea 	Resource exported or imported from land-locked countries ➔Economic development in land-locked countries Prosperity of ports in coastal countries Development of traffic routes' roadside areas	Paraguay — Brazil Zambia — Tanzania Malawi — Mozambique, etc.
Connection between two countries next to each other 	Mutual supplement of economic resources between A and B countries ➔Economic development in both countries Development of traffic routes' roadside areas	Brazil — Argentina Paraguay — Argentina Laos — Thailand, etc.
Transportation conducive to regional integrity 	Mutual supplement of economic resources between countries in the region ➔Economic development in countries in the region Development of traffic routes' roadside area Integral prosperity in the region	EU:TEN-T Transportation projects of GMS, PPP, and SADC aims to fall into this category.

CBTI conducive to the progress of regionalization

Expansion of intra-regional trade

CBTI is a key component in inducing regionalization.

The chart to the right shows trends in intra-regional trade ratio in major regions. The EU has significantly increased its intra-regional trade volume in the latter half of the 1980's, when regional market integration and regional transportation network (Cross-Border Transportation Network) building evolved. Since then, along with the accession of new member states, intra-regional trade ratio has fluctuated but remained high. In ASEAN, as regional economy improved, intra-regional trade ratio increased especially after the 1990s when economic alliances were strengthened significantly. Moreover, CBTI is a major factor in the revitalization of passenger transportation. In Asia, the number of intra-regional air passengers is on the rise as airport/domestic transportation network was improved.



Notes: East Asia includes Japan, China, South Korea, Taiwan, and ASEAN 10 countries. Export/import data of each country and region with Taiwan as a standard targets the period from 1983 to 2003. Source) IMF "DOT". Board of Foreign Trade, Taiwan, Chinese Taipei "Trade Statistics" (<http://eweb.trade.gov.tw/default.asp>) (EU15 shown above means statistics of EU 15 member states and EU 25 for that of EU 25 countries.)

Intra-regional trade ratio in major regions

Regionalization and transport infrastructure

EU has significantly increased its intra-regional trade volume since the latter half of the 1980's when regional market integration in the areas of transportation network, system and standards evolved in terms of both systems and facilities.

In Asian countries such as Singapore, Malaysia, and Thailand, system-oriented policies are in progress, including simplification of export and import procedures, which are believed to be conducive to regional economic development. In the GMS (Greater Mekong Sub-region) countries, east-west/north-south economic cross-border corridor development is underway and some have begun operation.

In South America, intra-regional transportation infrastructure is not necessarily smooth since it is often cut off at border points. Securing routes for export/import is essential for landlocked countries.

Africa has a small volume of intra-regional transportation due to its low regional economies and its under- developed transportation infrastructure.

The upgrading of domestic transportation network and linkage to the border is essential to the functionality of CBTI.

Major features of CBTI

The CBTI focuses not only on its physical feature as a facility near the border but also on the function conducive to the progress of regionalization. The features of the CBTI are shown below.

1 Possible combination of more than one mode of transportation

Although airports and ports are infrastructure located at the border, they do not function by themselves. Smooth operations of roads, railways, etc. are indispensable for gaining an access to airports and ports and help cross-border transportation infrastructure function fully.

2 Domestic and international infrastructure as an integral network

Without depending on infrastructure building at border points, it is necessary to push ahead with domestic transportation infrastructure building at the same time. There is no distinction between domestic and international CBTI.

3 CBTI corresponds to regional needs based on a strategy of regional development

CBTI needs to be aligned with the fulfillment of a recognized need in the region for cross border transportation.

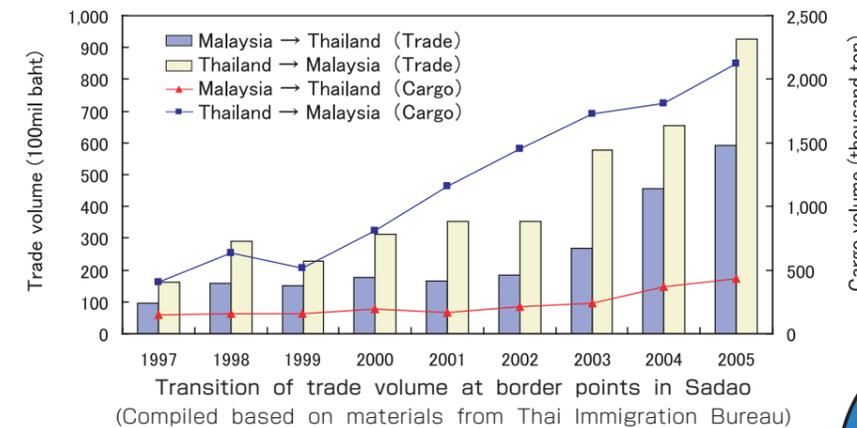
The impact of CBTI (Example of border between Thailand and Malaysia)

On the border between Thailand and Malaysia, running east and west in the center of the Malay Peninsula, there are major border points on the east and south sides. The CBT on west side is conducive to long-haul human exchange and trade between Thailand and Malaysia, while the CBT on the east side is mainly for residents in the border area. Although the conditions are the same for the east and west borders in terms of existing CBTI with roads and railways, they came to fulfill different infrastructure functions as stated earlier due to their physical conditions, development status of cross-border road network in two countries, functions of railway stations, status of software infrastructure building, and physical relationship with ports. The functions of the CBTI are not uniform but should correspond to each regional situation.

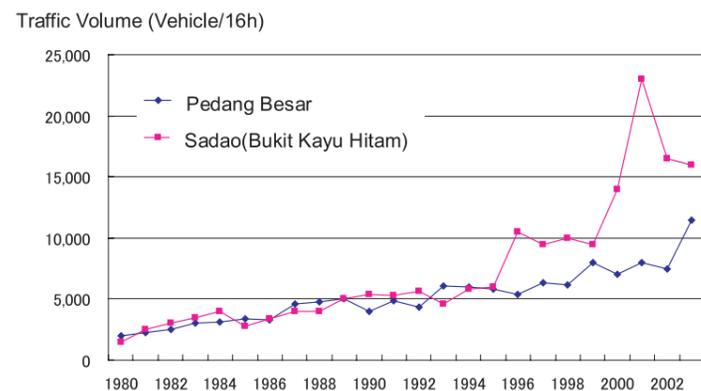
Province (Thai side)	Mode of transportation	Thai side	Malaysian side	Current situation
Songkhla (west side)	Road	Sadao	Bukit Kayu Hitam	Arterial roads are constructed. On Malaysian side, the road reaches to Kuala Lumpur. The condition of roads with two lanes on Thai side is excellent.
	Railway/Road	Padang Besar	Padang Besar	<Railways> Procedures of both countries are done at one building on the border. After getting off the trains, departure formalities are made at the window and entry formalities are done at adjacent window, which take five minutes each. For container cargoes from Bangkok to Port Klang, single-stop inspections have been used since 2005. <Roads> Traffic volume is lower than Sadao. Narathiwat
Narathiwat (east side)	Railway/Road	Sungai Kolok	Rantau Panjang	<Railways> Like Padang Besar, procedures of both countries are done at one building on the border. <Roads> Kolok river is on the border and this area is known for smuggling. Both countries are connected by national highways over the bridge between Sungai Kolok and Rantau Panjang.

In Sadao, The trade volume has been on the rise since 2000 when an IT system was introduced.

Note: Thanks to EDI, the travel time for cross-border cargoes from Malaysia to Thailand was reduced by 60 to 90 minutes.



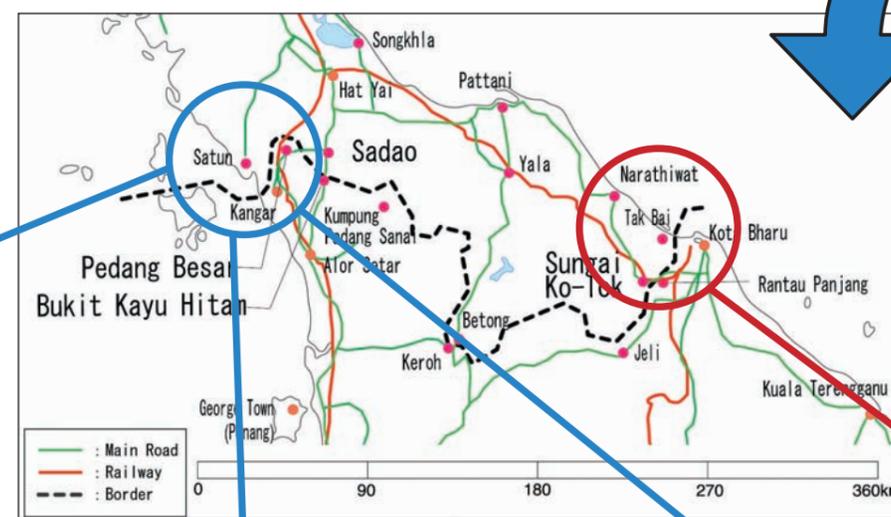
In Sadao, the traffic volume is on the rise since 1994 when highway on Malaysian side was launched on a full scale.



Trends in cross-border traffic volume between Thailand and Malaysia (Compiled based on results of Malaysia's domestic traffic volume survey)

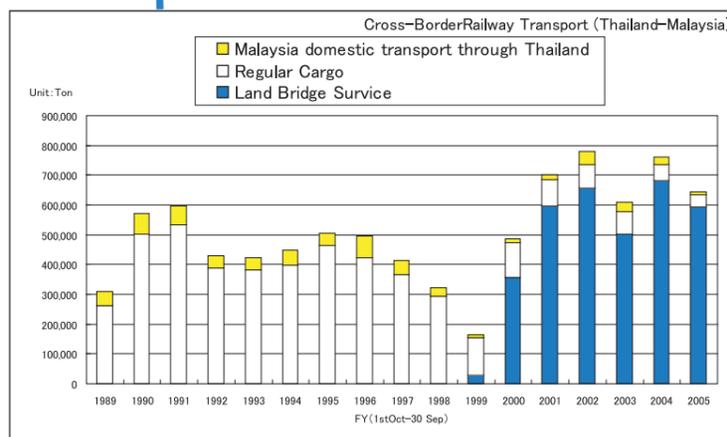
Notes: The above figures differ from actual cross-border traffic volume since it is a sum of through traffic leading to the border based on domestic traffic volume survey in Malaysia.

- Reference: 5 innovations for increasing the CBT:
(T. Yoshida, 2001, paper produced for academic conference on international development "Lessons from the cross-border transport system building between Malaysia and Thailand")
1. Innovation in trade system (e.g. lowering tariff barriers)
 2. Innovation in transport technology (e.g. popularization of container transport to promote multimodal transport)
 3. Innovation in infrastructure service management (e.g. privatization of section responsible for infrastructure service)
 4. Innovation in information services for secure transport by reassuring consignors
 5. Financial innovation to promote credit expansion and facilitate settlement.

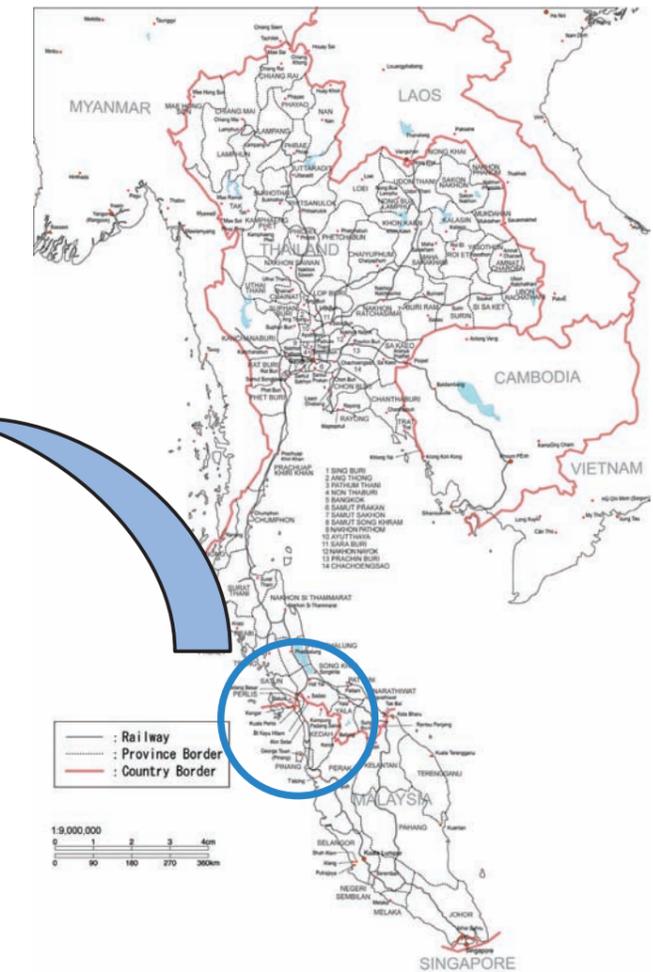


Land bridge service* made a full-scale start in 1999, which led to an increase in demand.

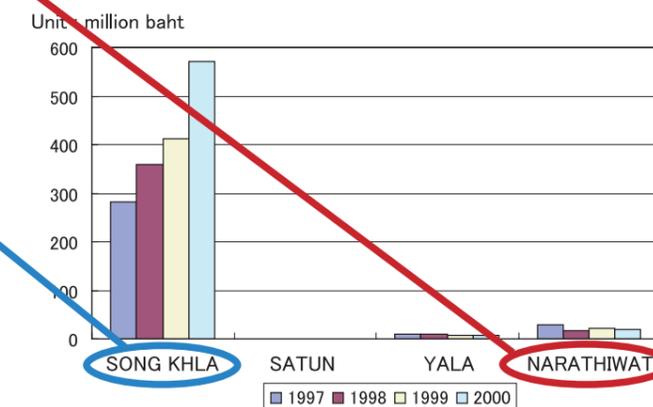
Notes: Container transport service bases on cooperation between SRT and KTM, linking Bangkok and Kuala Lumpur within 60 hours. Inspection at the cross-border point is omitted.



Transition of cross-border railway freight volume between Thailand and Malaysia (Compiled based on materials obtained from SRT)



The roles of the CBTI vary among borders. Border in the west: For trade and a long-haul freight transportation between Thailand and Malaysia. Border in the east: Mainly for transport of residents in border area



Provincial trade volume (Thai side) with Malaysia (Compiled based on Thai national trade statistics)

Towards CBTI Development

Points to note in CBTI Development

For CBTI development it is necessary to note of the following critical aspects:

Consider the role of infrastructure in both target country and region

It is essential to clarify the role of infrastructure from the viewpoint of regionalization by looking at the impact of this infrastructure on the development of regional alliances, and on bilateral relation.

Build CBTI with a focus on creating a wide-range transportation network

It is vital to increase overall regional attraction by improving such distributed networks as ports/airports and promoting trade in landlocked and regional countries as well as setting up a broad tourism network

Build CBTI with consideration for the establishment of international transportation

It is important to provide infrastructure that meets international standards or offers versatility and continuity since CBT should be conducive to the creation of a wide-range transportation network. Coordination over non-physical infrastructure, including regional wide-ranging system and procedures, and unifications is also required. In addition, major domestic transportation networks, which are expected to accept

influx of CBT, also requires compliance with international systems and standards.

Implement CBTI conducive to regional development and improvement

Although its contribution to formulation of wide-range transportation network is important, coordination with the development of the border area is also indispensable. The way that CBT relates to regional development is crucial. CBTI should have an emphasis on correlation with regional needs by setting up a special economic zone in border areas to create job opportunities or by building regional centers such as Michi-no-Eki to expand the market of local industries.

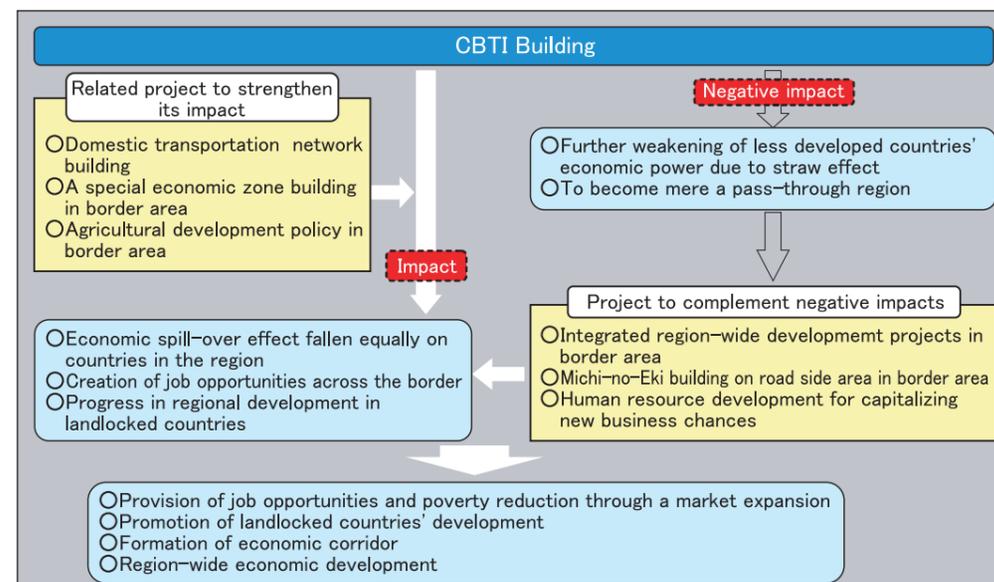
Integrate operational framework in post-construction period

It is necessary to establish various kinds of operational framework in order to realize the desired impact during the post construction period. This framework includes maintenance of facilities, operation of such public transportation as railways and buses, road safety measures through establishment of operating organization, securement of budget, reform for existing organization, and human resources development, etc.

Coordination of CBTI projects with Other Projects

Assistance to CBTI related areas should not be considered independently, but should be expected to have a synergistic effect by integral building of domestic transportation networks or a wide range of other developments.

In addition, active coordination with other projects is also necessary to avoid negative impact.



Outline of comprehensive cooperation approach for CBTI

Considerations for assistance in CBTI

① Stretching across the Borders:

- Build an economic corridor
- Promote development in cooperation with regional countries
- Develop landlocked countries that are geographically disadvantaged

② Considering when impacts become visible:

- Consider that impacts may be visible in short or medium/long term.
- Develop as regional common facilities.

③ Expanding functions and its impacts:

- Ascertain features and functions of border

- regions.
- Promote a strong impact on development in coordination with regions and industries.
- Implement projects to counter negative impacts.

④ Assisting capacity building necessary for infrastructure development, operation and maintenance:

- Promote capacity building for operation and maintenance of facilities
- Training of transportation operators necessary for better performance of CBT

Points to note for each stage of the CBTI project

Project Formulation Stage

- Study the historical background and regional cooperation
- Clarify the long-term goals of the CBTI
- Clarify its role in the transportation network of the region

Planning Stage

- Draw a plan adopting a comprehensive approach
 - Facility building
 - Systems and standards
 - Operation and maintenance
 - Human-resource development and capacity building (for management and maintenance)

- Related projects to maximize the CBTI impacts
- Related projects to mitigate negative impacts

Implementation Stage

- Consider country risk caused by involvement of multiple countries
- Adjust the plan according to the situation
- Hold discussions with related countries for smooth project implementation

Operation or Post Construction Stage

- Monitor maintenance, operating status, and impact of the CBTI building
- Review the programme including the implementation of related projects

Issues to be addressed in the future

• A regional transportation model and data base

There is a strong need demand for developing a regional-based transportation model and a data base for enabling network demand forecast and decision making for investment priorities and for impact assignments

• Regional cross-border project policies

Necessary CBTI varies depending on the regional context, for instance the difference between Asia and Africa. Thereby, a region-by-region CBTI building policy should be formulated to be used as a guideline for specific project implementation.

• All sectors' cooperation (e.g. industry, public sector, academic institutions, and NGOs)

The CBTI building is new challenge to JICA and Japan's development assistance. It should not be implemented single-handedly by JICA. Considerations for cooperation with other institutions and sectors including foreign/international institutions are required.

• Case studies and pilot studies

In order to explain necessity and significance

of the CBTI, it is essential to conduct an analysis and an evaluation of existing facilities and a pilot study to utilize experiences acquired from them for future project development.

• Public Relation (PR) activities

PR activities, targeting a wide spectrum of people ranging from government to the private sector, are necessary to improve awareness of the CBTI's necessity and significance.

• A comprehensive approach

It is important to implement a comprehensive approach in order to promote regionalization which leads to improvement of living environment and economic development of the region.

This approach includes not only single CBTI building but also multi-sectoral infrastructure, promotion of cross-border investment, promotion of private sector's participation, human resource development, environmental protection, tourism development, and others.

The comprehensive approach, which materializes measures and means for achieving this goal should be promoted.