

Expanding Horizons:
A Study on the Development of the Indonesia,
Malaysia, Thailand Growth-Triangle Economic
Connectivity Corridors

ABBREVIATIONS

ADB	-	Asian Development Bank
ASEAN	-	Association of Southeast Asian Nations
BIMP-EAGA	-	Brunei, Indonesia, Malaysia, Philippines-East ASEAN Growth Area
BWCT	-	Butterworth Container Terminal
CSP	-	Country Strategy Program
GMS	-	Greater Mekong Subregion
GPS	-	Global Positioning System
IMT	-	Indonesia - Malaysia - Thailand
IMT-GT	-	Indonesia - Malaysia - Thailand Growth Triangle
JBIC	-	Japan Bank for International Cooperation
NBCT	-	North Butterworth Container Terminal
RETA	-	regional technical assistance
RPJM	-	Rencana Pembangunan Jangka Menengah (Medium-Term Development Plan)
RRSP	-	Road Rehabilitation (Sector) Project
SRIP	-	Strategic Roads Improvement Project
SRRP	-	Sumatra Region Road Project
TA	-	technical assistance
TEU	-	twenty foot equivalent unit

Table of Contents

	Page
EXECUTIVE SUMMARY	1
I. INTRODUCTION	1
II. INFRASTRUCTURE, REGIONAL COOPERATION AND GROWTH	4
A. ROLE OF INFRASTRUCTURE IN ASEAN'S VISION OF ECONOMIC INTEGRATION	4
B. INFRASTRUCTURE, TRADE AND GROWTH.....	5
C. INFRASTRUCTURE COOPERATION IN OTHER SUBREGIONAL COOPERATION INITIATIVES	8
III. INFRASTRUCTURE CONNECTIVITY AND TRADE IN IMT-GT	11
IV. IMT-GT CONNECTIVITY: HISTORICAL CONTEXT	14
A. REGIONAL STUDIES ON PROMOTING CONNECTIVITY IN IMT-GT.....	14
B. DONOR ACTIVITIES IN INFRASTRUCTURE SECTOR OF IMT-GT	16
V. PRESENT STATUS OF IMT-GT CONNECTIVITY CORRIDORS	18
A. INDONESIA.....	18
B. MALAYSIA.....	22
C. THAILAND.....	24
D. PRESENT CROSS BORDER ISSUES IN IMT-GT	26
VI. IMT-GT: THE WAY FORWARD	28
A. ASEAN TRANSPORT ACTION PLAN.....	28
B. NATIONAL PLANS AND STRATEGIES	28
C. OTHER RECOMMENDATIONS FOR IMT-GT PROJECTS	31
APPENDICES	
APPENDIX 1: INFRASTRUCTURE INDEX OF SELECTED ASIAN COUNTRIES	36
APPENDIX 2: ASEAN ECONOMIC COMMUNITY FOUR PILLARS	37
APPENDIX 3: PROPOSED PROJECTS OF TA 5550-REG	38
APPENDIX 4: TRANSPORT SECTOR PROJECT RECOMMENDATIONS 2003-2008 (TA 6013)	40
APPENDIX 5: ADB INFRASTRUCTURE PROJECTS IN IMT-GT	41
APPENDIX 6: FIELDWORK OBSERVATIONS ON THE STATUS OF IMT-GT TRANSPORT INFRASTRUCTURE	43
APPENDIX 7: SUMATRA EASTERN HIGHWAY	48
APPENDIX 8: LIST OF PERSONS MET	50

EXECUTIVE SUMMARY

(i) In January 2007, the Indonesia, Malaysia, Thailand Growth Triangle (IMT-GT) subregional cooperation initiative adopted a new Road Map to refocus its cooperation initiatives over 2007-11. The IMT-GT Road Map, *inter alia*, identifies four economic connectivity corridors as key to strengthening regional connectivity to support increased intra- and extra-regional trade, investment and tourism. These are the (i) Extended Songkhla-Penang-Medan Economic Corridor; (ii) Straits of Melaka Economic Corridor; (iii) Banda Aceh-Medan-Pekanbaru-Palembang Economic Corridor; and (iv) Melaka-Dumai Economic Corridor. The economic corridor approach has been identified as a core strategy for accelerated development of IMT-GT, and development of these economic corridors was declared a Flagship Project of IMT-GT at the 13th Ministerial Meeting of IMT-GT in Selangor in September 2006.

(ii) *Expanding Horizons: A Study on the Development of the Indonesia – Malaysia – Thailand Growth Triangle (IMT-GT) Economic Corridors* was initiated by the Asian Development Bank (ADB) as a first step in implementing a key recommendation of the new Road Map, by assessing the development prospects of the proposed IMT-GT economic connectivity corridors. The study is a preliminary assessment of the opportunities, constraints and challenges to developing the subregion's connectivity and thus strengthening its growth potential. The focus of this study is, consequently, on identifying the current status of existing infrastructure assets, potential areas for intervention and other areas where further research is necessary to fully develop and utilize corridor connectivity.

(iii) The economic corridor framework of cooperation is a focused approach to expanding cooperation in infrastructure projects, but also goes further in helping promote economic growth and social development. It is a mechanism that integrates physical infrastructure to production, trade and investment, by way of minimizing non-physical cross-border barriers within a specific geographic area in order to promote increased flow of trade and investment, expanded access to raw materials and external markets, regional development in border areas, and increased efficiency in the use of economic space.

(iv) The process of enhancing IMT-GT connectivity should take into account, and indeed take advantage of, the synergies of the ASEAN wide initiatives on trade and investment liberalization and facilitation as well as the broader initiatives towards establishment of the ASEAN Economic Community (AEC) by 2015. Experience and achievements of other subregional cooperation initiatives, like GMS, CAREC, and SASEC, in promoting regional infrastructure connectivity should also be drawn upon as both models and benchmarks for development of economic connectivity corridors and regional infrastructure connectivity within IMT-GT.

(v) The conceptual framework of this study encompasses infrastructure connectivity as well as trade and investment for the simple reason that infrastructure is inextricably linked to trade and investment through its impact on transportation costs, competitiveness and productivity. Physical connections, especially transport links, are essential for the movement of goods, services, capital, people, and information across countries. The study, therefore, focuses on enhancing regional infrastructure connectivity with an explicit recognition of the objectives of IMT-GT, which are promoting trade, investment and tourism in the region.

(vi) The study's framework also recognizes that physical connectivity alone is not sufficient in itself. It has to be enhanced by a combination of cross-border software (i.e. harmonization of regulations, procedures, and standards, open market and globalized perspectives, efficient transport logistics, and global transport networks). Improvements in roads and railways can reduce transport costs, but they are not sufficient to encourage cross-border trade if different legal and regulatory frameworks, inefficient systems of customs clearance, and other barriers and logistical constraints are not removed. In this sense, greater physical connectivity requires regional/subregional cooperation for both cross-border hard infrastructure and related software. Currently, very little information exists on the transport and logistics constraints to trade within IMT-GT. To identify such constraints and establish benchmarks for quantitative assessment of progress in improving regional connectivity, **it is necessary to undertake a rigorous and comprehensive study of transport costs and logistics development of the IMT-GT corridors.**

(vii) Given the scale of needed investments in infrastructure and limited availability of public resources, private sector has to play an important role in enhancing regional infrastructure connectivity. A major obstacle identified by the private sector as inhibiting its involvement in regional infrastructure projects is the lack of a clear legal framework for its participation. Government acceptance of risk-sharing between the public and private sector players is also important to attract private investment. IMT-GT stakeholders, including the governments, private sector and development partners should **initiate structured policy dialog informed by empirical analysis to effectively enhance the role of private sector in infrastructure investments. A first step in this direction may be to initiate regional workshops to identify and disseminate an agenda and scope for such policy dialog.**

(viii) IMT-GT is a classic growth triangle characterized by strong economic complementarities, geographical proximity, and close historical, cultural and linguistic affinities between the participating countries. Yet, actual trading links between the three countries are far below potential. Percentage of trade between IMT-GT member countries relative to total trade by each country is not high compared to their trade with other trading partners such as Japan, US and PRC. The largest trade flows are between Malaysia and Thailand who share a common border, and relatively better infrastructure connectivity. Between 1995 and 2005, there was significant increase in Thailand's trade with Indonesia and vice versa. However, these are national-level data which do not account for substantial intra-country variations in economic activities. Data on trade specific to IMT-GT region are not systematically collected and collated, and are thus not readily available. To enable quantitative assessment of regional cooperation in promoting intra-IMT-GT trade and to identify policy issues relevant to trade promotion in the subregion, **there is an urgent need to develop a trade and investment database specifically for IMT-GT.** The First IMT-GT Leaders' Summit in 2005 had also recognized this, and called for development of such a database. Further, it is also recommended that the **impact of infrastructure constraints on trade and investment be quantified by undertaking a comprehensive survey of the trade and investment climate in the IMT-GT subregion.** Findings from the survey and its analysis will help empirically inform policy dialog in infrastructure and logistic development of the IMT-GT economic connectivity corridors.

(ix) Since the start of IMT-GT in 1993, two studies have been undertaken on subregional connectivity. Both studies recognized and highlighted lack of adequate transportation connections and low levels of overall trade as significant constraints in the growth prospects of the IMT-GT subregion

(x) Efforts by IMT-GT to promote connectivity in the past show a mixed picture of achievements combined with lack of implementation of other good initiatives. Some recommendations of the earlier studies were carried out, notably expansion of the Belawan port, development of the Satun-Kuala Perlis Highway, and some rural road maintenance, rehabilitation and improvement programs. On the other hand, several proposed initiatives could not be implemented, which may reflect the impact of the 1997 Financial Crisis. The crisis affected the whole region but some countries were impacted far more than others, like Indonesia. Consequently, infrastructure needs and gaps today are relatively higher in Sumatra, Indonesia than in the Malaysian and Thai subregions of IMT-GT. With economic recovery and a more stable economic climate, needed investments should be able to proceed at a faster rate than they have in the recent past.

(xi) Field work undertaken for this study along the proposed IMT-GT corridors also highlights several potential areas of constraints and bottlenecks. The north-south corridor in Sumatra is currently a two-lane highway for the most part, and barely able to handle existing traffic volumes. Average travel speed on this corridor was only about 50 kilometers per hour in field estimates, compared to almost twice that on the north-south highway connecting southern Thailand to Peninsular Malaysia (the Straits of Melaka corridor). The north-south Sumatra corridor will likely run into severe constraints within a few years as the traffic volumes continue increasing. **There is need, therefore, for considering expansion of the corridor into a 4-lane highway at the earliest. There is also a need to prioritize the link of this corridor to the Dumai-Melaka corridor by improving the road between Pekanbaru and Dumai.** In addition, there is need to further address deterioration in road quality due to factors such as excessive loading of trucks and inadequate maintenance. Feeder roads into the north-south Sumatra corridor also need to be improved, and road rehabilitation and maintenance works need to be expanded.

(xii) Surface transport within Sumatra also needs to consider role of railways, including the rail lines between Rantau Prapat –Duri – Dumai port and between Banda Aceh and Rantau Prapat. More broadly, there is a **need to undertake a thorough feasibility study of railway transportation in Sumatra.** Sumatra also needs to review airport development, including accelerating implementation of new airport in Medan. Given the wide diversity of investment needs in infrastructure in Sumatra, including roads, ports, airports and railways, and in view of the large amounts of investments required, **there is a need for IMT-GT to promote and support development of a Transport Sector Master Plan for Sumatra.** At a subsequent stage, the Sumatra Master Plan could be extended to develop an integrated master plan for the entire IMT-GT transport sector.

(xiii) Two of the proposed IMT-GT corridors are multi-modal, across the Straits of Melaka. These include the Extended Songkhla-Penang-Medan corridor and the Dumai-Melaka corridor. Their development will depend upon and in turn support increased maritime trade across the IMT-GT subregion. Past efforts at promoting ro-ro links across the Melaka Straits have had limited success, and there is need to better understand both the demand potential and supply constraints to the development of these two corridors. Consequently, **there is a need at this stage to develop a detailed understanding of the maritime trade across the Straits of Melaka, in terms of its contents, costs, constraints and potential. This will require a study of ports and maritime trade in the IMT-GT subregion, which should also include within its scope movement of tourists.**

(xiv) Amongst the four proposed IMT-GT economic connectivity corridors, the Straits of Melaka Economic Corridor, connecting provinces in southern Thailand and states in

Peninsula Malaysia along the western coast, is relatively most advanced in terms of transport connectivity. Cross border trading arrangements between the two countries are also relatively well developed, with an active platform for bilateral discussions in the Joint Development Strategy. There is, nonetheless, substantial room for improvement in the software of transport connectivity, as well as in seeking to convert this transport corridor into a truly economic corridor. Analogous to the Silicon Valley for IT industry, this corridor can potentially develop into a dynamic regional and even global "Halal Highway". The proposed study of logistical constraints (para vi above) can be used to identify specific areas of further policy dialog and cooperation initiatives related to improving and strengthening cross-border trading arrangements.

(xv) Every long journey, it is said, begins with a first step. Enhancing regional infrastructure connectivity in IMT-GT through development of the proposed economic connectivity corridors is an ambitious undertaking, which will require a long time horizon, large amounts of public and private resources and most importantly, political commitment and open minds. This study recognizes it is only a first step in a long road ahead. Not surprisingly, it raises more questions and areas of future enquiry than answers, but if in doing so, it contributes to greater stakeholder focus and policy dialog on developing IMT-GT regional economic connectivity, it will have more than achieved its modest ambitions.

IMT-GT ECONOMIC CONNECTIVITY CORRIDORS



I. Introduction

1. Founded in 1993 with ten provinces/states from the three countries, the Indonesia, Malaysia, Thailand Growth Triangle (IMT-GT) has now grown to a total of 26 provinces, including the entire island of Sumatra, and eight provinces from southern Thailand and eight states from Peninsular Malaysia. The sub-region now encompasses a population of more than 70 million people, and will grow further in 2007 with the addition of more states/provinces.¹ The cooperation initiative has sought to promote economic growth in the subregion through greater intra- and extra-regional trade, investment and tourism.

2. Progress in regional cooperation under IMT-GT was adversely affected by the Financial Crisis in 1997 which affected the whole region and focused government efforts towards macroeconomic and domestic issues. With the gradual economic recovery of the region, the governments in IMT-GT have increasingly focused on strengthening regional cooperation and, at the First Leaders' Summit of IMT-GT held in Kuala Lumpur in December 2005, leaders of the three countries sought to revitalize and refocus the initiative by asking for a new Road Map to be developed. The new Road Map, developed in 2006 with intensive stakeholder consultations and ADB assistance, was approved at the Second IMT-GT Leaders' Summit in Cebu in January 2007.

3. The new IMT-GT Road Map identified four economic connectivity corridors as key to strengthening regional infrastructure to support increased intra- and extra-regional trade, investment and tourism. These are the (i) Extended Songkhla-Penang-Medan Economic Corridor; (ii) Straits of Melaka Economic Corridor; (iii) Banda Aceh-Medan-Pekanbaru-Palembang Economic Corridor; and (iv) Melaka-Dumai Economic Corridor (see Box 1). The economic corridor approach has been identified as a core strategy for accelerated development of the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT), and development of these economic corridors was declared a Flagship Project of IMT-GT at the 13th Ministerial Meeting of IMT-GT in Selangor in September 2006.²

4. The economic corridor framework of cooperation is a focused approach to expanding cooperation beyond infrastructure projects to promote poverty reduction and social development along a geographic corridor. It is a mechanism that integrates physical infrastructure (e.g. road, power, telecommunications); to production, trade, investment, by way of minimizing non-physical cross-border barriers within a specific geographic area in order to promote: 1) increased flow of trade and investment, 2) expanded access to raw materials and external markets, 3) regional development in border areas, 4) and increased efficiency in the use of economic space. Development of economic corridors goes beyond a Transport Corridor or individual infrastructure projects, to a more comprehensive approach to cooperation and development. It has proved to be a useful approach in achieving low-cost connections deep into the hinterlands by being a catalyst in transforming linear networks into tree networks and it is a means to direct limited resources to areas with the highest economic potential and where leverage of private sector investment is most likely to succeed.

¹ Six provinces from Thailand – Chumphon, Runong, Surat Thani, Krabi, Phang Nga and Phuket – are likely to join the IMT-GT initiative this year.

² "For IMT-GT, the corridor approach will (i) provide focus and serve as a catalyst to the development and growth of ancillary activities and areas within and around the economic corridors, (ii) generate investment opportunities in terms of commercial activities and infrastructure support services, (iii) achieve synergy through clustering of projects within and around the economic corridors" (IMT-GT Roadmap of Development, 2007)

5. The present study was initiated by the Asian Development Bank (ADB) as a first step in the development of the IMT-GT economic connectivity corridors, with a view to undertake a preliminary assessment of the opportunities, as well as of the constraints and challenges to enhancing the growth potential of these corridors, with a focus on the status of physical transport connectivity. The objective of this preliminary assessment is to identify the current status of existing infrastructure assets and potential areas of intervention as well as to identify areas of further research to fully develop and utilize these IMT-GT corridors. It is fully understood that this study marks only a first step in a long and ambitious journey to enhance regional infrastructure connectivity in IMT-GT to help IMT-GT achieve its vision of a "seamless, progressive, prosperous and peaceful subregion with improved quality of life".

6. As a first assessment of the proposed IMT-GT economic connectivity corridors, the study's findings rely on a robust examination of existing literature and field realities, supplemented by extensive consultations with government officials at the national and sub-national levels, as well as representatives of donor agencies. The study also incorporates findings from a field study that included travel of more than 2,500 kms along the four economic connectivity corridors over a period of three weeks, which included detailed physical inspection of existing infrastructure assets. Needless to say, not each transport mode in terms of port, airport and road could be visited due to the limitations of time.

7. The outline of the study is as follows. Following the introduction, chapter II provides an overview of the existing framework for regional infrastructure cooperation and economic integration in ASEAN as well as in some of the other subregional economic cooperation initiatives in Asia. The chapter also briefly presents a framework outlining the well-recognized importance of infrastructure connectivity to competitiveness, trade and growth. Chapter III looks at the same issues, but specifically in the context of IMT-GT, including an assessment of intra-IMT trade and the subregional infrastructure. Chapter IV provides a historical context to approaches, achievements and challenges of enhancing regional connectivity in the IMT-GT while chapter V uses findings of the field study to provide a perspective on current status of the proposed IMT-GT economic connectivity corridors. Finally, chapter VI pulls together the analysis and findings in the study to provide specific recommendations for the way forward.

Box 1: The Four Economic Corridors: Building Blocks of IMT-GT's Development

A large part of the action plans and activities in the IMT-GT Roadmap for Development (2007-2011) is directed towards four economic corridors which are considered as the building blocks for the further development of the neighboring areas. (see page (i) for the map showing these corridors).

1. Songkhla Penang-Medan Economic Corridor

The first corridor includes Songkhla, Penang and Medan, which are already established international gateways with well-equipped seaports that can improve connectivity by sea—important for bulk shipments of goods—between Southern Thailand and Northern Malaysia and Sumatera, as well as provide onward shipping services to East Asia and Europe. While the Medan-Penang corridor is one of the most developed subregional corridors like Batam-Singapore, there is a need to upgrade the corridor by way of competitive Ro-ro ferry services, efficient inter-modal connection, improved access to Belawan Port and relocation of the congested Polonia Airport. Phatthalung Province is the rice-growing plain in southern Thailand. The area has potential for cattle-raising in the form of contract farming and for supplying the IMT-GT subregion with meat and dairy products. Phatthalung is also a well-known site for eco-tourism, with a large freshwater lake that is suitable for bird-watching and other leisure activities. Nakhorn Sri Thammarat also has vast potential for developing economic linkages with the rest of the IMT-GT. It is home to Hua It Agricultural Wholesale Market, the largest wholesale market in Southern Thailand supplying agricultural products to Malaysia and Singapore. Moreover, it has tourist attractions such as the Pramahatat Temple, as well as ecotourism (waterfall and beach resorts) and handicraft centers.

2. The Straits of Melaka Economic Corridor

The Straits of Melaka Economic Corridor is important for expanding connectivity—physical, economic, commercial—between southern Thailand and Peninsular Malaysia. Due to the proximity of this corridor to Sumatera, there is considerable potential for complementation in various stages of the production chain with the Indonesian subregion of the IMT-GT, especially if a series of economic and industrial zones are established at strategic points along the corridor. This corridor can also serve as a food hub, especially as a halal food hub with a number of food terminals and integrated food centers being planned within the corridor. The corridor can be transformed into a coastal belt development zone.

3. The Banda Aceh-Medan-Dumai-Palembang Economic Corridor

The Banda Aceh-Medan-Dumai-Palembang Economic Corridor which, is parallel to the designated transit transport route of the ASEAN Highway Network in Sumatera, is of critical importance for developing the Sumatera subregion of the IMT-GT, and its development needs to be closely coordinated with that of the other three corridors. It complements the Extended Songkhla-Medan-Penang Corridor, as it will improve the flow of goods and services to major trading centers and staging points in Sumatera, which can then connect with those in Southern Thailand and Northern Malaysia. It provides access to several international ports in the eastern coast of Sumatera such as Bandah Aceh, Medan, Pekanbaru, Dumai, and Jambi.

4. Dumai Melakka Economic Corridor

The fourth corridor between Melaka in Malaysia and Dumai in Indonesia constitutes another principal link between Sumatera and Peninsular Malaysia. In terms of the corridors, it serves as another link between the Straits of Melaka Economic Corridor and the Banda Aceh-Medan-Dumai-Palembang Economic Corridor.

Source: IMT-GT Roadmap for Development (2007-2011)

II. Infrastructure, Regional cooperation and Growth

A. Role of Infrastructure in ASEAN's Vision of Economic Integration

8. The vision of ASEAN economic integration is to have a highly competitive region that is increasingly integrated into the global economy, where there is freer movement of goods, services, investment, skilled labor, freer flow of capital, and equitable economic development. By 2015, the vision for the ASEAN Economic Community is directed towards the creation of a single market of more than half a billion people for consumer goods with one production base, thereby promoting economies of scale and boosting the ASEAN region's attractiveness to investors.

9. Regional infrastructure connectivity is critical to realization of the ASEAN vision. Not only does infrastructure affect production and consumption directly, but it also creates many direct and indirect externalities and involves large flows of expenditure, thereby creating employment and growth. A joint study by the ADB, Japan Bank for International Cooperation, and the World Bank, (2005) has emphasized infrastructure's significant role and impact in Asia and the Pacific --from meeting the requirements of basic standard of living to improvement in a country's regional and international competitiveness, to overall economic growth and even poverty reduction.

10. A recent ADB study (ADB (2007) ³) provides a comprehensive discussion on infrastructure development in the region, including an analysis of the continuing and potential issues, emerging trends, and funding requirements in the near future. The study notes that except for Malaysia and Thailand, overall infrastructure quality index of each country in Asia and the Pacific is below the global mean. Of the 110 countries included, Indonesia is ranked 66 while Malaysia and Thailand are ranked 14th and 33rd, respectively. In terms of the quality of port facilities and inland waterways, Indonesia is ranked 71st. Clearly, infrastructure deficiency is relatively larger in Indonesia, which reflects to a substantial degree the relatively greater impact of the 1997 regional financial crisis on Indonesia. In terms of investment needs, the financing requirements are huge for Asia, with estimates projected at about 6% of the region's GDP for 2005-2010, or some \$131 billion in new investment and \$118 billion for maintenance. Among the sectors, roads rank among the top three in terms of needed investments, along with communication and electricity generation. Meanwhile, country-level time series data indicate that private sector investment in infrastructure has not recovered to pre-crisis levels in several countries, including Indonesia, Malaysia, and Thailand. Problems of private sector participation in roads in the region are compounded by slow progress in policy, regulations, and institutional reforms.

11. Moon and Roehrl (2005) showed that while there are a plethora of regional programs and frameworks for agreements in the transport sector (ASEAN member countries concluded 9 regional transport agreements since late 1998), there is currently little cooperation on actual operationalization of infrastructure for long-term development. Regionalization expressed in terms of regional production networks needs to be complemented with regional cooperation between and among governments in infrastructure development to address the many inter-country challenges, and reduce the potential risks of marginalization of hinterlands, landlocked

³ ADB (2007). ADB's Infrastructure Operations: Responding to Client Needs.

countries, and small relatively poor economies. Given the vast resources of the region, an improved regional integration process for ASEAN as a whole is critical to boosting intra regional trade and improving access to international markets.

12. The ASEAN countries are endowed with a heterogeneous level of infrastructure facilities, and show unbalanced regional development. Even within IMT-GT, although all three countries are middle-income countries, each of them has areas with much higher levels of poverty than the national averages. To attain any meaningful integration, emphasis should be given on augmenting infrastructure endowment of the required kind, particularly in the border regions, so as to utilize the benefits of trade.

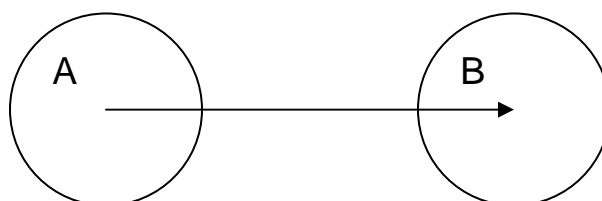
B. Infrastructure, Trade and Growth

1. Infrastructure and Trade: A Conceptual Framework

13. Recognition of transport and other costs of trading underlies the well-known analogy of trading melting ice - higher costs of trading imply "less" of the good reaches the destination. Consider, for example, two regions A and B (in two different countries or within one country) as shown in the figure below. Suppose the price of a good is P^A in A and P^B in B. If P^A , for example, is much smaller than P^B , the good will be exported from A to B. Conversely, if P^B is much smaller than P^A , the good will be exported from B to A.

14. Now suppose there is a cost of moving the good from A to B, given by the amount X , which is assumed the same for moving from A to B and vice versa. Whether the good is traded from A to B or from B to A will depend on the ratio

$$\frac{P^A + X}{P^B + X}$$



15. As X becomes larger and larger, the ratio above converges to 1, which would imply no trade between A and B. Thus, the size of the costs X affects comparative advantage and the underlying basis for trade amongst regions.⁴

16. In practice, X can depend upon a variety of factors including infrastructure, logistics development, trade policies, and competitiveness of markets.

$$X = (\text{trading costs, distance, non-tariff barriers, cross-border trading arrangements, ...})$$

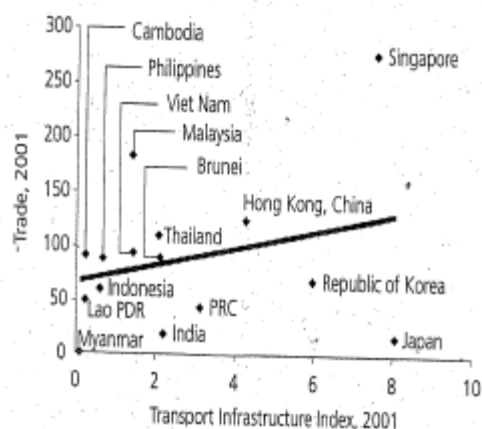
17. Thus, the level of regional connectivity has a strong relationship with trade, competitiveness and productivity. A major constraint to better competitiveness of

⁴ These costs also affect terms of trade and terms of rural-urban trade. For a full discussion, see Roland-Host, D., "Infrastructure as a Catalyst for Regional Integration, Growth, and Economic Convergence: Scenario Analysis for Asia", ERD Working Paper 91, Asian Development Bank, December 2006.

manufacturing in the hinterlands is the quality of the inter-country infrastructure networks, in addition to cross border issues and inefficient logistics system, as evident from empirical studies that have examined the effect of transport costs on trade flows. For instance, Liao and Vernables, (2001) show that infrastructure investments are important for export-led economic growth due to a robust statistical link between transport costs and international trade flows. The study also concludes that the quality of infrastructure in the origin and destination has significant effects on transport costs. Their estimation of the elasticity of trade flows with respect to transport costs are in the range of -2 to -3.5. This means that increasing trade costs by ten percent reduces trade volume by more than 20 percent. Any plan for ASEAN integration will thus, have to prioritize addressing the inadequacy of infrastructure and high transaction costs, particularly in low-income economies in the region, and in the low-income parts of middle-income countries, so that all parties can extract more benefits from such integration in a more equitable manner

18. In the Greater Mekong Subregion (GMS), available data also suggest that the development of cross-border infrastructure has played an important role in fostering growth in trade and investment within the GMS economies (Fujima and Edmonds, 2006). And from figure 1 below, it is evident that countries with fairly well-developed transport infrastructure facilities like Singapore and Hong Kong are way ahead in having more developed export markets. Myanmar, Lao and Indonesia, which are in the bottom of the transport infrastructure index for example, also did not have high trading volumes.

Figure 1: Transport Infrastructure and Trade in the Asian Economic Community, 2001



(i) Trade is taken as a percentage of the GDP

(ii) Transport infrastructure index is in Appendix 1

Source: Asian Economic Cooperation and Integration, Progress, Prospects and Challenges, 2005

19. Unfortunately, data on costs of transportation and logistical constraints specific to trade within the IMT-GT are unavailable. Development of such data should be a critical immediate objective for promoting trade and investment in IMT-GT. The data on transportation and other logistical costs would provide an important benchmark to quantitatively measure future progress in enhancing regional connectivity in the subregion, help to identify substantive constraints for policy interventions, and facilitate assessing impact and prioritization of various initiatives aimed at improving regional connectivity. **A rigorous and comprehensive study of logistical constraints and transportation costs in IMT-GT trade needs to be undertaken on a**

high priority basis to help inform policy on enhancing connectivity and promoting trade. Findings from the study should be discussed at two working groups of IMT-GT, dealing with infrastructure and with trade and investment.

2. *Infrastructure Software: Policies that Promote Connectivity*

20. Efficient cross-country transport infrastructure facilities are necessary, but by themselves, are not a sufficient condition to economic corridor development. Efficient infrastructure, such as roads are ineffective in the presence of border problems and high costs of doing business. Improved physical infrastructure has to go hand-in hand with improved efficiency in infrastructure software. These are changes in administrative and institutional policies that reflect: 1) *well developed social, political and business linkages, logistics and global transport networks*, 2) *open market and globalized perspectives to development*, and 3) *multi-country agreements, institutional arrangements, harmonized policies and programs*; that minimize non-physical connectivity barriers and facilitate increased connectivity within and beyond any geographic area. This is backed by findings that institutional quality is an explicit determinant of bilateral trade—signifying that performance of institutions can have a significant impact on transactions cost which in turn affect trade (De Groot 2004).

Box 2: Administrative and Institutional Policies that Promote Connectivity

1. Transport Logistics and Linkages with Global Transport Networks

Fierce competition for markets has forced manufacturers to integrate production and transport logistic strategies in order to reduce costs and provide higher service standards. Transport and distribution related activities, once considered secondary to production, are now being integrated in a process that starts with the collection of raw materials and ends with distribution and delivery of the manufactured products to the final consumer anywhere in the world. Inefficiencies in logistics have been highlighted as an important constraint in a firm's competitiveness in developing countries by earlier studies on investment climate and trade facilitation. Firms in countries with better investment climate and better logistics have a higher probability of exporting to international markets and attracting foreign direct investments (Hausman et al, 2005). The use of reliable and time-definite, door-to-door, freight-forwarding and multimodal transport services increases competitiveness and business. A challenge for developing economies seeking to be integrated into the multilateral trading system is to have efficient linkages with global transport networks.

2. Open Market and Globalized Perspectives

Policies should be directed towards opening-up markets. Participating in global supply chains can improve countries' access to markets and stimulate investment, and employment opportunities. Efficient logistics services play an essential role in the worldwide flow of goods and services and the ability of countries to attract and sustain investment.

3. Institutional Policies and Multi-country Agreements and harmonized policies and programs

Multi-country transport facilitation and transit agreements are important in removing non-physical barriers along sea and land routes, including border crossings. Agreements reached by subregional groupings can make a significant contribution to the removal of non-physical barriers to facilitate movement of vehicles and goods across borders. Conversely, inconsistencies among individual agreements can cause confusion and conflicts in interpretation. And that, until all countries are in a position to accede to international facilitation conventions, bottlenecks at border crossings will continue to add to transport costs.

C. Infrastructure Cooperation in other Subregional Cooperation Initiatives

21. Regional institutions and groupings act as conduits between individual countries and global institutions. They enable nations to combine their strengths, optimize benefits, and mitigate adverse effects of negative externalities – thus creating an environment where common services and development programs can be shared. Several regional/subregional cooperation initiatives have emerged through the years, and this section reviews their experience with regional connectivity.

1. GMS

22. The oldest and best known subregional initiative, that is oftentimes regarded as one of the more successful models of regional cooperation in Asia is the Greater Mekong Subregion program (GMS).⁵ The GMS Program, with support from ADB and other donors, helped the implementation of high priority subregional projects in transport, energy, telecommunications, environment, human resource development, tourism, trade, private sector investment, and agriculture.

23. The transport sector was one of the first areas of cooperation under the GMS Program when it began in 1992. Initially operating on a strategy of self-sufficiency with their national borders closed for all practical purposes, the countries thru the GMS program undertook a study and adopted a Transport Master Plan in 1995. Substantial progress has been achieved in terms of implementing GMS projects over the past 12 years. Priority infrastructure projects worth over US\$6 billion have either been completed or are being implemented. Among these are the upgrading of the Phnom Penh (Cambodia)-Ho Chi Minh City (Viet Nam) highway and the East-West Economic Corridor that will eventually extend from the Andaman Sea to Da Nang. A significant amount of resources have been mobilized for the GMS Program. One major achievement is the *GMS Cross-Border Transport Agreement (CBTA)*, which is a compact and comprehensive multilateral instrument that covers all the relevant aspects of cross-border transport facilitation in one document.⁶ The CBTA has entered into force with its ratification by all six GMS member countries in December 2003. Full implementation of the Agreement and its annexes and protocols is expected by 2007/2008.

24. ADB has been largely involved in establishing road corridors under the GMS program, where some 14 loans totaling about \$3 billion have been invested. Under the new GMS Transport Strategy, there are more than 150 new investment projects being proposed for the sector. Of these, 31 are considered high-priority investment projects, comprising 20 road projects, 2 railway projects, 4 airport projects, and 5 water transport projects. The GMS economic corridors are presented in Box 3.

⁵ GMS, comprising Cambodia, the People's Republic of China, Lao People's Democratic Republic, Myanmar, Thailand, and Viet Nam entered into a program of subregional economic cooperation in 1992.

⁶ These include: (i) single-stop/single-window customs inspection; (ii) cross-border movement of persons (i.e., visas for persons engaged in transport operations); (iii) transit traffic regimes, including exemptions from physical customs inspection, bond deposit, escort, and agriculture and veterinary inspection; (iv) requirements that road vehicles will have to meet to be eligible for cross-border traffic; (v) exchange of commercial traffic rights; and (vi) infrastructure, including road and bridge design standards, road signs, and signals. The CBTA applies to selected and mutually agreed upon routes and points of entry and exit in the signatory countries. The CBTA includes a preamble and 10 parts, and has 20 [annexes and protocols](#).

2. Central Asia Regional Economic Cooperation (CAREC)

25. The Central Asia Regional Economic Cooperation (CAREC) Program was initiated in 1997 by the ADB to promote economic growth and raise living standards in its participating countries by encouraging regional economic cooperation. The Program has evolved into an institutional framework that brings together eight countries and six key multilateral institutions for the purpose of regional cooperation in Central Asia.⁷ The Program has concentrated on financing infrastructure projects and improving the region's policy environment in the priority areas of (a) transport; (b) energy (including the water-energy nexus); (c) trade policy; and (d) trade facilitation (especially customs cooperation). In 2006, ADB prepared the RCSPU (2006-2008) for Central Asia. CAREC's multilateral development partners have prepared a \$2.3 billion three-year support program for transport connectivity, trade expansion and energy development.

26. Good progress has been made concerning the core sectors of the CAREC program. For example, the Transport Sector Coordinating Committee is now guided by a detailed work plan for the medium term, including a schedule for harmonizing transport regulations and provision for a sector strategy study over the next year that will be instrumental in identifying transport corridors for the region. The Committee has also supported the work of the Shanghai Cooperation Organization (SCO) in drafting a multilateral agreement concerning the cross-border movement of transport vehicles.

24. By end of 2006, ADB had financed 7 projects estimated at about \$300 million under the CAREC Program, plus over \$135 million in co-financing for 3 major projects. Most of the projects are in the transport sector, but a significant amount was allocated for the Regional Power Transmission Modernization Project.

3. South Asia Subregional Economic Cooperation (SASEC)

27. The SASEC was launched with ADB's assistance in 2001 to support and facilitate the regional cooperation initiatives of Bangladesh, Bhutan, India, and Nepal. ADB's support stemmed from the constitution of the South Asia Growth Quadrangle (SAGQ) by the Foreign Ministers of the four countries, also known as BBIN. The Ninth Summit of the South Asian Association for Regional Cooperation (SAARC) in 1997 had endorsed SAGQ as a subregional initiative under SAARC. SASEC provides a venue for policy dialogue, information sharing and confidence building among the four participating countries to enable better economic cooperation. Six priority sectors were identified, namely: (i) transport; (ii) tourism; (iii) trade, investment, and private sector participation; (iv) energy and power; (v) environment; and (vi) information and communication technology.

28. At the recently concluded Fourth Country Advisors' Meeting held in June 2007 at the ADB Headquarters, two major projects were endorsed, i.e., (i) Information Highway Project; and (ii) Tourism Development Project. Two projects having subregional cooperation impact have been financed by ADB: (a) West Bengal Corridor Development Project, and the Road Network Development Project in Nepal.

⁷ The CAREC participating countries consist of Afghanistan, Azerbaijan, PRC focusing on Xinjiang Uygur Autonomous Region, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan. The multilateral institutions include ADB, EBRD, IMF, Islamic Development Bank (IsDB), UNDP and WB.

Box 3: The GMS Economic Corridors**1. East-West Economic Corridor (EWEC)**

The East-West Economic Corridor (EWEC), about 1,450 km, has been completed except for a 40 km road section in Myanmar. As the only direct and continuous land route between the Indian ocean (Andaman sea) and the South China Sea, it is the first GMS corridor to have reached this stage. An initial impact assessment of the development impact of EWEC highlighted the (a) significant reduction in travel time along the corridor, for example by as much as 8 hours from the Lao-Vietnam border of Lao-Bao-Dansavanah to Savannakhet in Laos; (b) increase in FDI and joint ventures; (c) expansion in employment and income-generating opportunities; and (d) improvement of access of rural students to secondary schools.

2. North-South Economic Corridor (NSEC)

The North-South Economic Corridor (NSEC) comprises three different routes, namely, (a) Kunming-Chiang Rai-Bangkok via the Lao PDR or Myanmar route; (b) Kunming-Hanoi-Haiphong route, and (c) Nanning-Hanoi route. The Mekong bridge between Houayxay on the Lao PDR side and Chiang Khong on the Thai side remains to be the missing link along the first route of the North-South corridor. A site for the bridge has been agreed on, including the cost sharing arrangement between PRC and Thailand. Work on the transport links under the two routes of NSEC is progressing well with a target completion in 2010. Many sections in the PRC, Lao PDR, Myanmar, Thailand, and Viet Nam have been completed in the last 2-3 years.

3. South Economic Corridor (SEC)

The corridor consists of three main road sub-corridors connecting major points in Cambodia, Thailand, and Viet Nam. The three sub-corridors are making good progress toward realizing the target completion of 2010, with many sections in the sub-corridors already completed. Assessment of completed sections indicate that benefits are already being realized in terms of savings in travel time, lower travel costs for passengers and lower maintenance costs for vehicles, as well as increased volume of trade, and employment generation for the local population.

III. Infrastructure Connectivity and Trade in IMT-GT

29. The IMT-GT subregion is a classic growth triangle, characterized by many economic complementarities, geographical proximity, and close historical, cultural and linguistic ties. Economic complementarities and opportunities in the IMT-GT subregion span many agricultural and industrial products and activities, including rubber, palm oil, fruits and vegetables, marine products, oil and natural gas, chemical and wood products, among others. Yet, actual trade between these three countries of IMT-GT is far below potential.

30. Table 1 below shows data on trade between IMT-GT member countries as a percentage of total national trade, as well as trade with other trading partners as a similar percentage. The largest trade flows are between Malaysia and Thailand who share a common border and the border facilities permit some traffic to flow between the two countries to a limited extent; transport infrastructure between the two countries, especially road infrastructure is also in good condition. It is worth noting, however, that the last 5 years saw a significant increase in Thailand's trade to Indonesia. In fact, the largest growth in trade from 1995 to 2005 is in Thailand, i.e. an increase from 4.62% in 1995 to 9.15 % in 2005, an average yearly increase of around 7%. The largest increase in trade for Indonesia has been with Thailand showing an average yearly increase between 1995 and 2005 of 9% per annum, while Thailand's trade to Indonesia was even higher at 11% over the same period. It is clear from the table that the overall trade between the three countries is not high; trade with Japan and United States is much higher while trade with the People's Republic of China (PRC) is also now higher though it was less in earlier years.

Table 1: IMT-GT Trade Share 1995-2005 (%)

Country	Year	Indonesia	Malaysia	Thailand	IMT Intra- Trade	Japan	PRC	USA
Indonesia	1995	-	4.16	1.67	5.83	24.98	3.76	12.87
	2000	-	3.24	2.23	5.47	20.72	5.01	12.43
	2005	-	3.89	3.97	7.86	17.41	8.73	9.61
Malaysia	1995	1.44	-	3.24	4.68	20.07	2.38	18.48
	2000	2.20	-	3.73	5.93	16.7	3.47	18.76
	2005	3.02	-	5.35	8.37	11.71	8.83	15.75
Thailand	1995	1.09	3.53	-	4.62	22.9	2.75	13.75
	2000	2.02	4.70	-	6.72	19.47	4.72	16.81
	2005	3.11	6.04	-	9.15	18.0	8.88	11.28

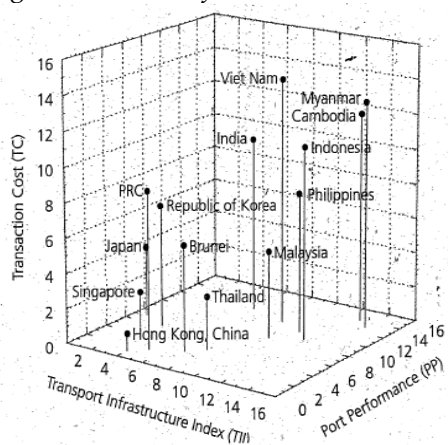
Source: ARIC website. Trade share (in %) refer to the percentage of trade with a partner to total trade of the country. A higher share indicates a higher degree of integration between partner countries.

31. Two aspects emerging from the table above are worth highlighting. First, the data presented are national level data since data at specific IMT-GT subregional level are not systematically collected and collated and are therefore unavailable. To the extent promotion of trade, along with investment and tourism, are the stated objectives of this subregional cooperation initiative, this is a serious conceptual lacuna. Practically too, this gap renders impossible any quantitative assessment of the extent to which IMT-GT cooperation has been successful in achieving its stated objectives. This fact was also recognized by the First IMT-GT Leaders' Summit in 2005 which called for the creation of such empirical basis to quantitative assessment of progress in subregional cooperation. **There is an important conceptual and**

practical need therefore to develop a comprehensive and sustainable database of trade, investment and tourism flows within the IMT-GT subregion.

32. Second, while infrastructure connectivity is only one of several factors that affect trade flows, it is likely that low levels of intra-IMT trade flows can be partially attributed to deficient connectivity, and high transactions costs in the subregion. A previous study on international integration in Asia, illustrates that countries that are poor in transport infrastructure performed poorly in trade, paid substantially high transactions costs, and are naturally failing to reap the full benefits on the globalization process (De, 2005). In figure 2, among the three IMT-GT member countries, Indonesia has had the highest transactions cost, the lowest transport infrastructure index, and the poorest port performance. To the extent a chain is only as strong as its weakest link, this makes it evident that improvement of transport infrastructure facilities in Indonesia will need to have relatively higher priority for IMT-GT economic corridor development.

Figure 2: Causes of Transactions Costs in the Asian Economic Community



- (i) Countries were placed based on their respective ranks
- (ii) Rank correlations between TC and TII and PP (Appendix 1), and TC are 0.66, 0.65, and 0.75, respectively, and correlation coefficients are significant at 5% level.
- (iii) Port Performance is measured in terms of congestion of the container ports of individual countries
- (iv) For better understanding of the graph, TC is placed on the vertical axis, TII on the 1st ground horizontal axis and PP on the 2nd ground horizontal axis

Source: *Asian Economic Cooperation and Integration: Progress, Prospects, Challenges*, ADB, 2005.

33. Once again, however, it needs emphasizing that these are aggregative national data, which are not necessarily reflective of the IMT-GT subregion given the significant intra-country heterogeneity in these three middle-income countries. Furthermore, given that infrastructure connectivity is not a sole determinant of trade flows, **it is important to quantitatively assess the impact of infrastructure and other logistical constraints on trading costs for trade within IMT-GT. There is a need therefore to undertake a rigorous study of transportation and logistics costs and constraints to intra-IMT trade.** It will also be important to empirically assess the extent to which such infrastructure and logistical constraints to trading actually affect ability of firms to trade and undertake investments in the subregion. **It is therefore recommended that a comprehensive survey of the trade and investment climate facing firms in IMT-GT be undertaken on a priority basis.** Findings of this study will help empirically inform policy dialog on mitigating infrastructure constraints and prioritizing infrastructure development projects in the region.

34. These potential constraints to enhanced trade and investment in IMT-GT and the need for increased regional connectivity have been acknowledged and recognized by IMT-GT leaders, government and private sector and are strongly reflected in the new IMT-GT Roadmap for Development.

Box 4: Strategic Thrusts of IMT-GT in Trade & Investment and Infrastructure Development

Trade and Investment Development

Enhancing IMG-GT competitiveness for investment and exports through the reduction of the cost of doing business and promotion of freer flow of goods and services in the IMT-GT region will involve the following measures:

- Simplification, standardization and harmonization of customs procedures and inspection of quarantine measures (CIQs)
- Joint promotion of the IMT-GT region as an investment destination
- Establishment of common wholesale markets and trading centers in border areas to promote and support trading activities
- Compilation and wide dissemination of applicable policies, rules, regulations and procedures to increase their transparency and facilitate compliance
- Collection, compilation and dissemination of economic business information on the IMT-GT

Infrastructure Development

Cooperation aimed at physically integrating the three subregions on a complementary basis and supporting the spatial and economic growth trends and patterns in the IMT-GT region involve the following measures:

- Improvement of cross-border infrastructure and transport service connections between Malaysia and Thailand
- Facilitation of road transport in the IMT-GT region through mutual recognition of road vehicle registration, transport operating license and vehicle inspection certificates
- Development of shipping services and facilities between Sumatera and northern Malaysia and southern Thailand to support cross-border trade and investment activities.
- Improvement and development of transport infrastructure in the north-south corridor in Sumatera to enhance economic linkages with the Malaysia and Thailand subregions of the IMT-GT region;
- Improvement and development of IMT-GT air services and facilities; and
- Development of strategy and program for IMT-GT cooperation in energy.

Source IMT-GT Roadmap for Development 2007-2011

IV. IMT-GT Connectivity: Historical Context

35. The importance of strong regional connectivity has been recognized in IMT-GT since its inception. Over the past fourteen years of IMT-GT existence, two studies have been undertaken on IMT-GT regional connectivity, both supported by ADB's regional technical assistance.⁸ This chapter reviews the findings of both studies to highlight the recognized role of the importance of regional connectivity in IMT-GT and to provide a historical context to the evolution of connectivity in this subregional cooperation initiative. The historical profile highlights both achieved successes in enhancing connectivity at project level, as well as changing relative priorities and constraints to the promotion of regional connectivity. The chapter also briefly reviews previous support by donors to infrastructure development in IMT-GT subregion.

A. Regional Studies on Promoting Connectivity in IMT-GT

36. At the inception of the IMT-GT initiative, a large study was initiated in December 1993 through a Technical Assistance (TA)⁹ by the Asian Development Bank. The study developed a comprehensive and integrated plan consisting of policies, programs, and projects for the development of IMT-GT in five main sectors, namely (i) trade, investment, and labor mobility; (ii) transportation and communications; (iii) agriculture and fisheries; (iv) industry and energy; and (v) tourism. The detailed studies for each of these sectors identified strong complementarities between the participating areas of the subregion. The report identified nearly 100 projects, policies, programs, and institutions which would develop the IMT-GT over the following ten years. A particular emphasis of the study was on the role of the private sector and how it could act as an engine of growth for the IMT-GT. The findings of the study were summarized in a subsequent ADB publication in 1996.¹⁰

37. The study was a pioneering effort because there was no assessment of the transport sector (or other sectors for that matter) of IMT-GT prior to its formation in 1993. In the transport sector, the study assessed the adequacy of the existing IMT-GT transport network, facilities and services, and identified project investments and policy changes relating to transportation that would improve the availability and quality of transport infrastructure and minimize restrictions on flows of goods within the IMT-GT area. The study specifically examined the supply and demand conditions, policy constraints, and growth trends relating to facilities and services in land transport, maritime transport, and air transport. The general conclusions that can be gleaned from the ADB TA-5550 is that the transport system of the IMT-GT subregion during its formative period lacked an extensive network of transport infrastructure and services and individual national subregions had significant inadequacies. Some of the major projects proposed by the study are given in Appendix 3.

38. Some of the examples cited by ADB TA-5550 of the inadequacy of the transport facilities in the IMT-GT subregion include:

⁸ TA 5550-REG: Study on Indonesia - Malaysia - Thailand Growth Triangle Development and TA 6013: Strengthening Subregional Cooperation in the Transport Sector

⁹ There were two regional technical assistance projects. The first, and smaller technical assistance implemented preparatory work while the second technical assistance, TA 5550-REG: *Study on Indonesia-Malaysia-Thailand Growth Triangle Development Project* for \$1,400,000, approved on 6 October 1994, examined the feasibility of IMT-GT in detail.

¹⁰ Indonesia - Malaysia - Thailand Growth Triangle: Theory to Practice, Edited by Myo Thant and Min Tang, ADB, 1996.

- Inadequate road access to Belawan and Lhokseumawe Ports
- Low capacity standards in 90 percent of southern Thailand's railways
- Inadequate access to Penang Port because of the lack of direct link between it and the North South Expressway
- Limited railway system of northern Sumatra
- Limited ship sizes because of the low controlling depths at many of the IMT-GT ports such as Belawan and Songkhla.

39. The second regional study of connectivity in this subregion covered both the IMT-GT subregion and also the Brunei - Indonesia - Malaysia - Philippines East ASEAN Growth Area (BIMP-EAGA).¹¹ The study was financed by and ADB TA supporting the revival of subregional cooperation initiatives among both IMT-GT and BIMP-EAGA countries and focused on improving transport links within the two regions.

40. The study provided background information of the transport sector development in both the BIMP-EAGA and IMT-GT regions and gave basic information on strategic projects in promoting regional cooperation in the two subregions. The TA was useful for the Government of Indonesia in preparing the regional transport strategy financed under ADB TA 4204-INO: *Subregional Transport Cooperation Initiative* as follow-up action. The consultants of the TA produced a list of transport projects that they considered necessary to promote subregional economic cooperation between the countries. However, the projects do not constitute a comprehensive transport development plan for the IMT-GT subregion. They are no more than a list of projects whose development is a prima facie case. A major problem in developing a set of transport projects for the IMT-GT transport market is the absence of data to determine the demand for transport services along the intra IMT-GT routes. The projects listed, however, are not as comprehensive as the previous 1993 study, (TA 5550-REG), described previously. Appendix 4 shows a list of the proposed projects for each subsector, land, maritime, and air developed by TA 6013.

41. The two studies, the first developed at IMT-GT's inception in 1993 and the other in 2004, more than a decade later, thus provide a glimpse into the priorities for regional connectivity in the initiative, as well as achievements and challenged to implementation. For example, the first study identified projects primarily in southern Thailand and Peninsular Malaysia, implying that infrastructure constraints in Sumatra provinces included in IMT-GT then were not viewed as relatively as important. Over time, however, more provinces of Sumatra have joined IMT-GT and investment in infrastructure in Indonesia did not keep pace with growth due to the Financial Crisis, resulting in greater constraints perceived in Indonesian regions of IMT-GT. In addition, the review of these studies and their recommendations also shows a mixed picture of achievements of infrastructure initiatives, with many of the recommendations of earlier studies carried, while several others are yet to be implements (e.g. expansion of Medan Airport). Projects like the expansion of Belawan port, development of the Satun-Kuala Perlis Highway, and rural road maintenance, rehabilitation and improvement programs were implemented.

42. A number of the previously recommended investment projects yet to be implemented are still viewed as important, and have thus become part of the Action Plan of the new IMT-GT Roadmap for Development prepared through stakeholder consultations in 2006. Now that the

¹¹ TA 6013: Strengthening Subregional Cooperation in the Transport Sector of EAGA and the IMT-GT Regions, for \$260,000, approved on 18 December 2001.

economic climate is more stable, the proposed investments should, with available financing, be able to proceed at a faster rate than they have in the past.

B. Donor Activities in Infrastructure Sector of IMT-GT

43. Malaysia and Thailand, both middle income countries (MICs) are no longer active borrowers, so most donor activities have centered on Sumatra in Indonesia. ADB has undertaken several projects supporting development of roads and ports in Sumatra, which are presented in Appendix 5 .

44. The World Bank has also funded a number of road projects in Sumatra including most recently the Sumatra Region Road Project (SRRP) and the Strategic Roads Improvement Project (SRIP). The objective of the SRRP was to improve transport efficiency and accessibility within the four provinces of the Northern Sumatra region and adjacent regions through (a) strengthening integrated planning and management of transport infrastructure in the region within the Government of Indonesia's (GOI) decentralized framework; (b) developing and preserving the road networks in the Project region to environmentally sustainable and economically efficient levels; and (c) improving resource use and service delivery through gains in policy implementation and technical efficiency.

45. The World Bank approved the SRIP in June 2006 which covered several areas throughout Indonesia including Sumatra, particularly the provinces of Jambi, South Sumatra, and Lampung. The project includes (i) improvement of approximately 155 km of urban and inter-urban roads, (ii) expansion of road capacity on approximately 85 km of urban and inter-urban roads; and (iii) construction of approximately 55 km of new urban and inter-urban roads.

46. The JBIC has also undertaken a considerable amount of road projects in Sumatra, Indonesia, including the South Sumatra Rehabilitation Project in 1987, and the Road Rehabilitation Project (II) in 1989. These projects covered road widening, pavement, and overlay and priming on shoulders, as well as the replacement of bridges on badly damaged sections of arterial roads in South Sumatra. The second project involved rehabilitation works, including road widening, surfacing, and repairs to side ditches, on sections of arterial roads (national/provincial) in 8 provinces in Sumatra. JBIC also undertook the Heavy Loaded Road (HLR) Improvement Project and the Sumatra East Coast Highway Project in the 1990s. Follow up construction activities were recently undertaken through a JBIC financed loan covering about 186 km of the road between Bandar Lampung and Palembang. This was further extended by another 94.9 km south of Bandar Lampung (this has, however, at the present time, only about 65% of the works completed).

47. JBIC has also undertaken work at Dumai Port. The Dumai Port Development Project was completed in 1996 and increased the cargo handling capacity of Dumai Port from the pre-project level of 700,000 tons/year to 1,500,000 tons/year. Palm oil accounts for approximately 80% of cargo handling through Dumai Port and roughly 90% of the outgoing cargo. The cargo handling volume has increased by approximately 60% since project completion, against a background of exponential growth in oil palm production in Riau Province, and in 2000 had grown to 4 million tons, outstripping handling capacity by a wide margin. Of this, roughly 3 million tons is export cargo, which have increased 2.3 fold against the level of 1.3 million tons at project completion. It will be necessary to further expand the port facilities in order to respond to predicted future growth in cargo demand. JBIC is currently undertaking another project at

Dumai Port, which is still ongoing, to cover new berths, dredging etc. Plans are also being made for the establishment of a container terminal at the port. The loan has been extended until November 2008 due to delays in moving the navy jetty.

48. The review of previous studies and donor activities shows that there is a need to strengthen the relationship between planning of subregional projects and implementation of national programs by donors, which result in actual implemented projects often diverging from subregional planning or initiatives. There is a need for greater integration of regional cooperation initiatives involving infrastructure projects in IMT-GT, and there must be strengthened dialog between donors, respective governments, and government's national planning agencies to be able to come up with more relevant and streamlined projects.

49. Another precondition to successful regional or cross-border cooperation in infrastructure is the availability of trained and skilled manpower to design and implement projects – and this is where donor initiatives can play an important role. Foreign aid in the form of technical and capital assistance (mainly soft loans) remains an effective instrument for developing countries to achieve their industrialization objectives and poverty reduction goals. In this regard, capacity building is called for (The Boao Forum for Asia Annual Report 2007). In the role of neutral broker and advisor, multilateral and bilateral institutions are in a strong position to mobilize financial resources for capacity building as well as investment in developing and middle-income countries.

V. Present Status of IMT-GT Connectivity Corridors

50. To follow up on the development of the IMT-GT Economic Connectivity Corridors in the new Road Map, a field trip was undertaken to investigate the current status of roads, port, airports, and railways and other existing infrastructure assets relevant to the proposed Corridors. Based on the desk review and discussions, including with ADB staff in the Indonesia Resident Mission, the field trip concentrated most heavily in Sumatra where the needs for improvements to transport infrastructure were perceived as relatively higher. For purposes of clarity, the discussion below has been subdivided into a review of the status within each country for each of the transport subsectors, namely, road, port, and airports. At the same time, it should be kept in mind that the four proposed Corridors comprise roads in Sumatra and roads linking southern Thailand to Peninsular Malaysia, while the other two corridors are multi-modal links across the Straits of Melaka. Appendix 6 provides a summary of the present conditions of the IMT-GT transport infrastructure facilities based on findings from the field work.

A. Indonesia

(i) Roads

51. The field trip examined the roads in Sumatra that had already been identified as a potential growth corridor, i.e. from Bandar Lampung – Palembang – Jambi – Pekanbaru – Medan .

52. Global Positioning System (GPS) equipment was used over the entire length of the road to check distances and average speeds. Average speeds varied by section of road between 45.3 kilometers per hour (km/h) and 53.0 km/h. The average speed over the entire length of the road from Bandar Lampung – Banda Aceh was 50.4 km/h. The width of the road varies from 5 meters (m) to 10 m with the majority of the road being around 7.5 m wide. The high density of truck traffic is one of the factors of the low average speed as there is very little opportunity to pass trucks in some sections of the route. The other factor that has caused the overall average speed to be low is the severe damage that has been caused by trucks in several sections of the road. It was also noticeable that in major towns, (e.g. Jambi, Pekanbaru, etc.) most of the traffic has to pass through the center of the town, i.e. there is no bypass. This causes considerable congestion in town centers, especially with truck traffic. Parking alongside the road is common practice resulting in traffic jams and a general impedance to traffic flow. [Appendix 7](#) shows pictures of damaged road sections and overloaded trucks.

53. The road roughness, as measured by the International Road Roughness Index (IRI), varies along the entire length of the road and ranges from IRI 2.5 to IRI 10.0. The damage to the road in several sections has been as a result of considerably overloaded trucks that are exceeding the legal axle load limits. As there is no enforcement of axle load limits the problem of overloaded trucks will persist and even if the road is improved, damage to it will continue. The volume of traffic also varies along the road. The annual average daily traffic (AADT)¹² of various points of the highway are summarized in table 2. It is apparent from the traffic volumes provided by the Directorate of Spatial Planning, that traffic volumes gradually increase as one travels from the south of Sumatra to the north of Sumatra. The current level of increase in traffic

¹² AADT is measured on a yearly basis by the Directorate of Spatial Planning.

in Sumatra is running at approximately 5% - 7% per annum.¹³ With this increasing growth the existing road will come under more pressure in terms of capacity and damage from the volume of trucks traveling the road.

Table 2 : Indonesia Road Statistics

Road Section	International Road Roughness Index (IRI)	Annual Average Daily Traffic (2006)
Jambi and Murlung-South of Sumatra	2.5-10.0	1,033-1,796
Rengat, Riau Province		5,791
Pekanbaru and Dumai, Riau Province		7,534-9,901
Medan Outskirts-towards Binjai		21,000
Langsa to Banda Aceh		8,000-9,000

54. Unit freight rates are high in Sumatra compared to Java, although economically they should be lower as trip distances are longer. The higher freight rates are probably caused by the poor condition of many of the roads. Road transport also takes twice as long because of difficulties encountered in overtaking trucks on several sections of road due to their slow progress with excessively overloaded vehicles. Roads are basically not wide enough to accommodate the increasing demand on them.

55. An improvement in road transport will enable larger volumes to be moved to the ports in Sumatra, namely Medan, Dumai, and Banda Aceh, for export to the rest of the subregion. Basically the main transport problem for products of Sumatra is transport from the point of production to the ports of Belawan, Dumai, and Banda Aceh. Rail transport should also be improved to support the increasing volume of goods movement to the ports.

56. There are also other factors which must be considered in terms of the road network in Indonesia: (i) maintenance of existing infrastructure and (ii) enforcement of traffic regulations. The condition of roads is generally poor, which raises costs of transport both for inputs and for output. Part of the reason for the poor condition of roads is overweight freight vehicles, which caused heavy damage to roads and exacerbates the already poor road conditions. Thus budgetary planning for road maintenance is not sufficient for the actual maintenance needs when the roads deteriorate.

(ii) Ports

57. The ports located in Sumatra along the economic connectivity corridor from Banda Aceh - Palembang are located at Dumai, Medan, and in Banda Aceh. It was not possible to examine the port at Dumai because access to the port was not given to the study team.

Belawan Port

58. The main port is at Belawan in North Sumatera, near Medan. This is the main general port in Sumatra, and the second largest general port in Indonesia, after Tanjung Priok Port of Jakarta. However, the port handles more export goods than imports, which are centralized in Java: Tanjung Perak Port of Surabaya handles more imports than Belawan. The port is divided into several areas, namely, the conventional port, a container handling area, and a passenger terminal. The port in Belawan has about 35,000 tons of storage facilities in the godown in the

¹³ ADB Road Rehabilitation-II Project, August 2005.

conventional port area. The wharf for berthing ships in the conventional port area varies in depth at various points along the wharf. Table 3 presents the various depths depth of the berths. The depth of the channel to the port at low water is around 9.5 m. This restricts certain vessels from entering the port and causes ships to be delayed until high tide, when the water level increases by a further 2.7 m to a total depth of around 12.2 m. The passenger terminal in its present location is taking up valuable space in the conventional port area and there are plans to relocate the passenger terminal to the Old Port in Belawan (located about 3 km from the main port). There is a passenger ship that leaves from Belawan to go to Jakarta once per week (carrying capacity of around 1,600 persons) There is also a ferry that goes to Penang twice per day carrying about 150 people. The container port is a modern area. Containers in the yard have to be stacked 5 containers high due to overcapacity of the container facilities (see table 3) . It has been estimated that the container yard needs to be expanded by about 2 hectares to cope with the rapid increase in the volume of TEUs being handled. Also, there are two container freight stuffing stations which need to be demolished to expand the size of the area for storing containers. Another effect that the rapid increase in the number of TEUs that are being handled is that there is now insufficient time to maintain some of the equipment since more time is being devoted to offloading and unloading TEUs.

59. The equipment of the container port, including 4 gantry cranes is becoming outdated and is slow compared to modern equipment. Straddle carriers for handling containers are not available. These would considerably increase the speed and efficiency of the container port. Using gantry cranes is extremely slow in moving containers.

60. The traffic in and out of Belawan goes to West Port, Port Klang in Malaysia, Thailand, and Singapore. Belawan is mainly a transit port. From Belawan the incoming freight traffic for Sumatra is destined for Medan, Pekanbaru and Banda Aceh.

61. As noted previously, ADB has been involved in several previous projects in assisting Belawan port to increase its capacity and in the provision of handling equipment. The field trip indicated that further assistance is necessary again as the port is experiencing capacity problems and the equipment is in need of replacement.

Dumai Port

62. JBIC have undertaken two projects at Dumai Port (the second loan project of \$30 million is still ongoing). Both projects have been involved with improving the operational performance of the port. The work that has been undertaken includes dredging and the addition of new berths. The Plans are also being made at Dumai port for the establishment of a container terminal.

Table 3: Indonesia Port Facilities

	Storage Facilities	Dimensions of wharf for berthing ships
<i>Belawan port</i>	35,000 tons	0-50m=6-7m
	2004= 18,000 2005= 22,000 TEUs/mo 2007= 35,000 TEUs/mo	50-1195=10-11m Depth of the channel to the port at low water= 9.5 m

(iii) Airports

63. The international airports serving Sumatra are in Banda Aceh Airport, Medan, Padang Airport, Pekanbaru, and Dumai

Padang and Palembang Airport

64. The Padang Airport was relocated in August 2005 and the Palembang Airport was expanded in October 2005. Padang airport now has a runway of 2,750 m and can handle Airbus 330's. The expansion of the airport in Palembang included new facilities for cold storage, a relocated passenger terminal and an extension to the runway. Palembang airport has a runway of 2,500 m and can handle 747 aircrafts. These two airport projects were both funded by JBIC. Bandar Lampung airport was expanded in 2005 and has a runway length of 2,500 m.

Polonia Airport

65. The main airport is located in Medan, i.e. Polonia Airport, and is an accredited international airport and can handle planes up to B-747 with a full load. Polonia airport, however, only has one runway, with planes taking off in one direction and landing in another direction. Due to extreme limitations of space as Polonia airport is situated within a built up area of Medan that is densely populated it is not possible to expand the existing airport. There are currently plans to construct a new Medan airport about 30 km from Medan. The master plan for the new airport has been completed and the engineering design is also complete. Land acquisition for the new airport has also been completed. It is estimated that it will take about four years to construct the new airport. Funding however, for the new airport construction has not been finalized. However, although funding has not been finalized for the new airport (several donor agencies have been holding discussions on possible funding including ADB and JBIC) the construction of the internal roads at the proposed new airport is already being undertaken. There are also plans to put in a rail link to the new airport. The new airport will have two parallel runways of 2,500 m long and 60 m wide compared to the existing Polonia airport which only has the one runway of 2,400 m long and 45 m wide.

66. Aside from the limitation to expand the existing Polonia airport, the equipment e.g. (X ray equipment, fire fighting equipment etc.) is old. There is also no closed circuit television (CCTV) facilities at the airport, although plans are underway for the installation of this equipment in 2007. The single runway at Medan is also used by military aircrafts, which also leads to delays in take-off and landing of commercial airlines. The apron of the existing airport is also relatively small and can only accommodate about 10 aircrafts. The passenger terminal is also operating beyond capacity. Passengers to Medan at present total around 4 million per year. The passenger terminal has a capacity of only about 1.5 million per year. Of the total passengers at the airport approximately 20% are international and 80% are domestic.

(iv) Railways

67. The Sumatra railway systems are located in north, west, and south Sumatra. The north Sumatera system was built by the Dutch to provide transport for the plantations and connects those areas with the harbor in Belawan. The west Sumatra and south Sumatra systems were

also built by the Dutch to link coal mines with ocean ports. The south Sumatra system now also connects to the port of Bandar Lampung.

North Sumatera Railway

68. The north Sumatera railway stretches 1,052 km. from Besifang, near the Aceh border in the north, through Binjai and Tebing Tinggi in the center, terminating at Rantau Prapat. A circle route connects from Binjai through Medan to Tebing Tinggi, with a spur to the Belawan Port. There is also a spur from Binjai to Pangkalan Susu (which is currently out of service) and other from Tebing Tinggi to Siantar in the interior. There are reported to be plans to extend the N. Sumatera system to serve the post-independence plantation areas. The average length of passenger journey in N. Sumatera was 140 km. and the average freight haul is presently around 200 km.

69. ADB undertook a Sumatra Railway Masterplan in 2000. This is very similar to the Sumatra Spatial Plan. One of the high priority routes from the plan the stretch from Banda Aceh to Rantau Prapat. A rail line from Rantau Prapat to Duri line will extend the N Sumatra system to Murao and on to Dumai. This rail line would carry crude palm oil (CPO) into the port of Dumai. Overall the Banda Ache - Medan - Dumai - Pekanbaru - Murao rail sections would then form part of the spine of the full trans Sumatra railway. Due to lack of implementation and the changed circumstances, there is need for a study to update the previous plan.

B. Malaysia

(i) Roads

70. The road network in the Malaysian portion of the subregion is well developed. There are two major north-south links, namely (i) Federal Route 1, which is mainly a single carriageway highway, and (ii) the North-South Expressway (NSE) which is a controlled access, dual-carriageway highway from Bukit Kayu Hitam to Singapore. Its total distance from Bukit Kayu Hitam to Johor Baru, on the border with Singapore, is 890 km. The road from Penang to the Thailand border at Sadao is also a dual-carriageway highway in very good condition with a speed limit of 110 km/h.

(ii) Ports

Port Klang

71. There are several ports in Malaysia that affect the IMT-GT subregion. Port Klang, is the largest port in the country, and is the main sea gateway to Malaysia. It started operation in 1901 and has become the country's largest seaport. Until the establishment of a major harbor at West Port, 12 km away on Pulau Indah, Port Klang, served by its North Port and South Port, was the main seaport for Kuala Lumpur. It is still a major shipping and cargo terminal.

Penang Port

72. Penang Port is strategically located along the Northwest coast of Peninsula Malaysia. It serves one of the busiest trade routes in the region and links Malaysia to more than 200 ports worldwide. Being a deepwater port and overlooking major shipping lanes in the Straits of

Malacca, it is a choice port of call for traders within the IMT-GT and the Asia-Pacific region. Penang Port is accessible via two channels, the North Channel and the South Channel.

73. The North-South Highway, spanning the west coast of Peninsular Malaysia from the Malaysia-Thailand border to the Malaysia-Singapore border, places Penang Port within easy reach of all major economic regions in the country. Penang Port is also linked directly with the east coast of Peninsular Malaysia via the East-West Highway

74. There are plans to expand the Penang port over the next 5 years (under the Ninth Development Plan) by acquiring more equipment, dredging, and increasing the number of berths (estimated expenditure of MYR1 billion). The container terminal in Penang port is about 11 m deep. To expand the port further, land reclamation of around 25 hectares is presently being undertaken. Of the total traffic in Penang port, 15% is from Thailand.

Table 4 Malaysia Port Facilities

	Storage Facilities	Dimensions of Wharf for berthing ships
<i>Penang Port</i>	Container terminal: 11 m deep	8-10 m
North Channel		10.7 m deep
South Channel		5.8 m or less (due to Penang Bridge)
Butterworth Wharves	There are 3 transit sheds with a total area of 10,033 square meters (sq m) and 1 godown with an area of 5,945 sq m.	Comprise 4 berths 8-10 m Overall wharf length=715 m
Butterworth Container Terminal (BCT)	770,000 TEUs/annum	
North Butterworth Container Terminal (NBCT)	(combined container handling capacity of (BWCT and NBCT)	
Vegetable Oil Tanker Pier (VOTP)		9 m
Prai Bulk Cargo Terminal (PBCT)		3 berths totaling 588 The inner berth is 7.5 m deep and the other 2 berths are 11 m deep.

75. Container traffic is handled at the Butterworth Container Terminal (BWCT) and North Butterworth Container Terminal (NBCT). At present, a portion of Penang Port's containerized cargo handling activities is conducted at BWCT, which has two berths at the Butterworth Wharves. Future plans for BWCT involve the consolidation of all container handling activities at the NBCT. The consolidation is expected to improve container handling activities and provide more berths for conventional cargo handling. NBCT is to be expanded with an estimated cost of MYR300 million. By completion, the NBCT Phase 2B Project will be able to handle 1 million TEUs. Penang Port Limited Company (PPSB) will continue to complete various component of the NBCT Phase 2B Project within the next two years. This also involves the reclamation of 25 hectares of land for the container yard and purchasing handling equipment which will cost about RM150 million. Reclamation works at the port commenced in February 2006. The wharves will be expanded by another 600 meters to accommodate 7 vessels at any one time. The depth at the port will also be increased by dredging to 13 m from the current depth of 11.5 m. PPSB is also planning a new back stacking area for export containers only. This project will be equipped with six new super post panamax gantry cranes and 15 rubber tired gantry

cranes. With these new enhancements to the port the productivity will be increased and it is estimated that approximately 35 TEUs will be able to be moved per hour.

76. The conventional cargo handled in Penang Port comprise break-bulk, dry bulk and liquid bulk. Installations dedicated to this activity are Butterworth Wharves, Vegetable Oil Tanker Pier (VOTP), and Prai Bulk Cargo Terminal (PBCT). Conventional cargo handling efficiency has been improved with the application of a computerized cargo and marine system catering for berth planning, equipment scheduling, godown management, and billing functions. The Butterworth Wharves, at present, comprise four berths for handling a variety of break-bulk cargo such as palm oil in drums, refined sugar, bag rice, iron and steel products, and manufactured goods. Once container handling activities are consolidated at the NBCT, Penang Port will have an additional two berths at the Butterworth Wharves to cater for break-bulk cargo. Located south of the Butterworth Wharves is the Vegetable Oil Tanker Pier (VOTP). The VOTP is dedicated to meet the specialized requirements of vegetable oil handling. The VOTP is linked via overhead pipelines to facilitate direct loading and discharging of edible oils to privately-owned storage tank farms. Prai Bulk Cargo Terminal (PBCT) provides dedicated facilities for handling dry bulk, non-edible liquid bulk and dangerous liquid bulk cargo. The variety of cargo handled at PBCT includes grains, soybeans and raw sugar. Liquid bulk, such as Liquefied Petroleum Gas (LPG) and Vinyl Chloride Monomer (VCM), are conveyed via pipelines to private onshore installations beyond the terminals boundaries. Due to the nature of the cargo handled at PBCT, Penang Port ensures that international safety standards are applied strictly. In addition, state-of-the-art firefighting/rescue/safety equipment are provided in adequate quantity.

(iii) Airports and Railways

77. There are international airports at Penang and Langkawi in the Malaysian subregion, and major domestic airports are located at Kepala Batas and Ipoh. The Ninth Malaysian Development Plan has made provisions for expansion of all airports to cater for the increase in demand. Similarly for railways the Ninth Plan has made provisions for rail improvements. For example track realignment and improvement works from Taiping to Padang Rengas are being undertaken. The completion of the double tracking of the rail line from Ipoh to Rawang is now scheduled to be completed by late 2007. Rail infrastructure upgrading and improvements include other double tracking at selected priority stretches, rehabilitation of tracks and stations as well as the refurbishment and procurement of rolling stock.

C. Thailand

(i) Roads

78. Provincial roads in the Thailand part of the subregion are in good condition. Rural roads are however poor. Rural roads are poorly maintained and there is poor access to it. The road from the border of Thailand and Malaysia at Sadao going towards Hat Yai is in poor condition and heavily congested. The road passes through several small villages and due to the large volume of traffic, serious road accidents occur to both pedestrians and vehicles. It has been proposed that an expressway be instituted between Sadao and Hat Yai parallel to the existing road to avoid these large volumes of traffic flowing through rural villages.

(ii) Ports

79. Apart from the port in Songkhla, it was not possible for the study team to visit all of the ports in the southern area of Thailand. Information on various ports was obtained from the Marine Department (MD). Ports in southern Thailand, the area associated with IMT-GT, are located in Trang and Satun Province

Komtang Port and Si Kao Port

80. In Trang Province the Komtang Port is presently undergoing improvements and the MD has received a budget of THB60 million for the port improvement/expansion. There is a proposed new port at Naklena and a feasibility study on this is now almost complete. If the study is feasible, the MD will continue with the detailed design and environmental study for the port. Trang Provincial Administration (TPA) is planning land acquisition for port construction which will be undertaken by the MD. It is expected that land acquisition will commence in late 2007. The port at Si Kao, was formerly this site was among the alternatives for the port mega project where the site at Paak Bara was eventually chosen. TPA is interested in investing in this port in order to serve a ro-ro ferry service. Currently the TPA has obtained permission for port construction from MD.

Tammalung and Customs Port

81. In Satun Province Tammalung Port and Customs Port was constructed to serve cargo vessels up to 400 deadweight tonnage (DWT). Due to limitations on channel depth of less than 4 m and the existing quay length, which is not suitable for accommodating ro-ro ferry vessels, the port does not have much development potential for IMT-GT trade. The Customs Port nearby has more potential to serve IMT-GT subregional trade. Due to this the Province has allocated a budget of THB43 million for port improvement and expansion.

Songkhla Deep Sea Port

82. The Songkhla Deep-Sea Port can simultaneously accommodate 3 ships of 173 m in overall length. The port is equipped with modern equipment and staffed with personnel who are fully conversant with inter-modal container traffic systems. The port total area is 115,000 sq m suitable for the working of large ocean-going cargo vessels. Access to the port is via an asphalt-paved concrete causeway from either Highway 408 from Nakhon Si Thammarat Province or Highway 407 from Hat Yai crossing over the Tinasulanonda Bridge. Access of vessels is via a 120 m wide channel dredged to a depth of 9 m below Chart Datum (CD) and with a length of 4 km. There is a 300m turning circle at the western end of the quay. The container yard, however, is now stacked up to 5 containers high due to limited space. A feasibility study which is expected to be completed by September 2007 has been conducted on a second port, designated as Songkhla Port (Phase II). A detailed design and environmental study will be conducted, after the feasibility study's completion.

Paak Bara Port

83. The new port presently being investigated at Paak Bara Port is primarily intended to serve international trade between Thailand and South Asia, Middle East and Europe. The detailed design and environmental study are still being conducted. The Minister of Transport

has asked for an additional study to review the port demand to ensure justification of port construction. Construction is expected to start in 2009 (at the earliest) and will take about 4 years. The long construction period is due to the need for the reclamation of the sea area.

New Paak Bara Port

84. Thailand exports para rubber and rice by going through Port Klang and Tanjung Pelapas in Malaysia as well as Singapore which adds more transportation cost since both Malaysia and Singapore put a surcharge on Thai exports. To cut transport costs of products such as rice, para rubber, etc. to European countries, the India subcontinent, Middle East, and Africa, the new deep sea port of Paak Bara (Lagoos district of Satun) would cost approximately THB5.6 billion. This will cut transportation costs by THB269 million a year. The advantage of Paak Bara over Phuket and Phang Nga deep sea port is that Paak Bara could accept larger ships (50,000 ton DWT) since Paak Bara is 13 m deep which could be easily upgraded to 25 m deep, and Paak Bara is only 150 miles away from international routes inside the Straits of Melaka. The Paak Bara deep sea port requires a good rail connection and there are 3 choices for the route: (1) Trang - La Ngoo - Paak Bara (100 km)¹⁴ (2) Hat Yai - Satun - Paak Bara (130 km)¹⁵ (3) Kuan Nian - La Ngoo - Paak Bara (110 km).¹⁶ The proposal for a land bridge to run between Songkhla - Paak Bara (a distance of around 130 km) by a dedicated rail or road link would enable transshipment of containers from Songkhla to Paak Bara for further movement (to Indonesia to either Medan or Banda Aceh, Europe, Middle East etc.).

Table 5 Thailand Port Facilities

	Storage Facilities	Depth of wharf for berthing ships
Songkhla Port	The container yard has a stacking capacity of 5,400 TEUs Total cargo throughput is 150 TEUs per year	8.23 m at 3 berths with a total length of 510 m and a 30 m wide apron and can simultaneously accommodate 3 ships of 173 m in overall length
Komtang Port in Trang Province		
Port at Si Kao		8-10 m
Tammalung Port in Satun Province	Constructed to serve cargo vessels up to 400 deadweight tonnage (DWT)	4 m

D. Present Cross Border Issues in IMT-GT

85. Land border is shared between Malaysia and Thailand in IMT-GT, and the major border crossing is at Sadao on the Thailand border and Bukit Kayu Hitam on the Malaysia side of the border. At the border at present, passenger cars can freely flow between the two countries by showing vehicle ownership and registration documents and by purchasing motor vehicle insurance to cover accidents in the other country. To reduce customs procedures and the goods inspection process for facilitating goods movement, the practice of presenting a single

¹⁴ Advantage: this is the shortest route, linking with Thung Song Junction, good for those who live in the Northern part of Southern region; Disadvantage: no link with the deep south and Hat Yai;

¹⁵ Advantage : connecting with Hat Yai, Satun and three deep south provinces - good political movement since it will support the Halal Food Industry in Pattani. It will also force the Port Authority to upgrade Songkla Deep Sea Port to have a rail link, creating a land bridge; Disadvantage : the longest route;

¹⁶ Advantage: a compromise since Kuan Nian is the station on the main route between Hat Yai and Thung Song - Disadvantage: investment required to upgrade Kuan Nian station into the same standard as Thung Song and Hat Yai.

inspection slip between Sadao Customs House and Bukit Kayu Hitam Customs House was introduced on 1 June 2005.

86. The border facilities at Sadao also have X-Ray equipment and also vehicle weighbridge facilities to ensure that the truck entering is within the legal axle load limit and weight restrictions for the country. On average the truck inspection is accomplished within 30 minutes (i.e. paperwork, X-ray etc.). Standardized customs procedures and forms (in the respective language) are available on both sides of the border.

87. In terms of freight vehicles moving across the border, the existing practice is a little more restrictive. At present only dual plated vehicles (i.e. those carrying Thai license plates and Malaysian license plates) are allowed to cross the border. Typically a Thai company enters into a joint venture with a Malaysian company (in which the Malaysian company will hold 51% of the shares). In this way a truck can carry dual license plates and registration papers and is thus allowed to freely travel over the border. The current system is relatively restrictive and needs to be expanded in scope. These issues are being discussed between Thailand and Malaysia through the JDS.

88. A Memorandum of Understanding on the Facilitation of Procedures on the Movement of Goods was undertaken on 27 July 2003. The first bilateral customs meeting between the Thai Customs Department and the Royal Malaysian Customs Department was held in Phuket, Thailand on 25-26 May 2005 to discuss the use of a single declaration form and single stop inspection procedures. The use of a single declaration form has been in full operation since June 2005.

89. Thailand also has plans for several new facilities. For example, new CIQ at Bugeta-Bukit Bunga, new CIQ at Ban Prakop in Songkhla province, new CIQ complex at Sungai Golok in Narathiwat Province and also a new CIQ at Betong in Yala province. The Joint Development Strategy for Border Areas (JDS)¹⁷ between Malaysia and Thailand continues to make improvements and to coordinate on border strategies.

90. The cross border arrangements between Thailand and Malaysia are considerably good when evaluated against to some of the restrictions on movement that are placed on countries within the GMS which also have cross-border agreements. For example movement of vehicles from Cambodia to Viet Nam is presently restricted to 40 vehicles. For Thailand and Malaysia the development of the dual plate system has allowed trucks the right to travel in each others territory and thus keep transport costs low (i.e. no unloading and reloading costs), but needs to be expanded in scale and scope.

¹⁷ Formed in 2004 to undertake joint planning and implementation of development projects along border areas in IMT-GT.

VI. IMT-GT: The Way Forward

91. Experience from other regional cooperation initiatives like GMS shows that development of economic connectivity corridors is a challenging task that requires time, resource mobilization and political commitment. Southeast Asia has long recognized the need for greater regional integration and cooperation, and this is manifested in ASEAN activities. These should help provide a broader framework and facilitate political commitment to development of IMT-GT regional connectivity. This chapter also briefly describes initiatives at national level for developing infrastructure that has regional dimensions. These infrastructure plans when implemented will contribute to enhancing IMT-GT connectivity. Finally, based on the initial assessments of this preliminary study, the chapter also identifies specific infrastructure projects that need to be prioritized in future plans of stakeholders, as well as reiterating areas where further studies are needed in order to empirically and analytically inform policy dialog on future development of IMT-GT economic connectivity corridors.

A. ASEAN Transport Action Plan

92. The ASEAN member countries themselves recognize that only by effectively enhancing the physical means of transport in the ASEAN region can intra regional trade and investment be augmented. For example, the ASEAN Transport Action Plan 2005-2010¹⁸ cited that shipping logistics within ASEAN are relatively efficient, with shipping time per kilometer between ASEAN ports similar to better integrated markets like the European Union. The issues lie in the lack of quality road transport to ports, poor port infrastructure, and suboptimal shipping networks. All these exacerbate entry barriers and high operating costs, which discourage logistics companies from coming into the region. The absence of logistics players worsens the already fragmented transport systems, further reducing the trade competitiveness of the ASEAN region. With the planned ASEAN Economic Community integration being pushed forward from 2020 to 2015, the Leaders of the member countries have reaffirmed that an efficient integrated transport system is key for ASEAN to integrate with the global economy, improve competitiveness, and enhance the inflow of foreign direct investment. Hence, ASEAN as a regional bloc agreed to intensify regional activities to enhance multimodal transport linkages and interconnectivity, promote the seamless movement of people and goods, promote further liberalization in the air and maritime transport services, and further improve integration and efficiency of transport services and the supporting logistics system.

B. National Plans and Strategies

1. Indonesia's Mid-Term Development Plan

93. Infrastructure development is a key component of Indonesia's Mid-term Development Plan, for 2005-2009.¹⁹ Infrastructure investment needs in Indonesia are large and the

¹⁸ ASEAN Transport Action Plan 2005-2010, see (<http://www.aseansec.org/16597.htm>)

¹⁹ Renacana Pembangunan Jangka Menengah, Presidential Regulation 7/2005 on the National Medium-Term Development Plan issued on 19 January 2005. Other reference materials used in this section were transcripts of the Keynote Address by the President of the GOI and the presentation of the Minister of Transportation in the Second Indonesia Infrastructure Conference last 1 November 2006.

Government of Indonesia (GoI) can only provide part of this funding, and the major portion will have to come from the private sector. Presidential Regulation No. 67/2005 was approved in 2005 and this decree outlined a more robust legal and regulatory framework for Public-Private-Partnerships, placing emphasis on mutual benefits, transparency, and having a fair risk sharing framework and long-term payback periods. In addition, the GoI shall:

- facilitate private sector and local government participation by allowing and encouraging private entities to build and operate seaports, railways, airports terminals and encourage local authorities to jointly invest and operate transport infrastructure
- set-up tariff policy mechanisms to guarantee increased business ventures
- accelerate reforms on legal and regulatory aspects that promote laws that are consistent with international best practices
- revoke the State Owned Enterprises' (SOEs') monopoly in transportation sectors
- promote increased security in investment for slow yielding projects (i.e. sufficient concession periods)

94. Apart from government regulation reforms, Indonesia's Ministry of Transportation is working on revising four transportation laws that are being undertaken²⁰ in view of the need for alternative solutions for the government's shortage of funds to finance all the needed infrastructure projects, in view of recent globalization trends, decentralized policies, and the need to give bigger opportunities for the private sector.

95. The GoI Ministry of Transport has the following projects in the pipeline²¹:

- Development and improvement of several main seaports in Belawan, Dumai, Bojonegara, Tanjung Priok extension, Makaassar, Banjarmasin, Balikpapan, Bitung, Jayapura and building more inter-island vessels and ferries to cater to industry's growing needs.
- Development, extension, and modernization of several main airports such as the Hasanuddin Airport, New Lombok Airport and new Medan Airport, in order to facilitate the fast growing air passengers of more than 20% per year.
- Project to extend runways and improve Instrument Landing Systems (ILS) for most airports.
- Project on strengthening and modernizing the domestic and international air carriers
- Development of Train Network in Sumatera and Kalimantan

2. Malaysia Ninth Development Plan

96. In Malaysia, the Ninth Development Plan has just been formulated and runs from 2006-2010. The main thrust of the plan pertaining to infrastructure, is on the greater utilization of existing facilities with emphasis on better delivery and quality of services, and expansion of networks. In road development there is an emphasis towards improving access to less developed areas, particularly those with the potential for tourism, agriculture development, and

²⁰ Status of Indonesia Transport Laws: 1) Rev. Law No.13/1992 on Railways- Final discussions and approval expected by end of 2006; 2) Rev. Law No.14/1992 on Land Transportation and Traffics, 3) Rev. Law No.21/1992 on Sea Transportation, and 4) Rev. Law No.15/1992 on Air Transports are all currently being discussed, and approval is expected by Mid 2007

²¹ As of November 2006

rural growth centers. The Highway Network Development Plan (HNDP) identifies priority projects to improve the national road network in Peninsular Malaysia. Rail transport under the plan period focuses on increasing operational efficiency as well as promoting rail transport as a major mode of transport for freight traffic. Track realignment and improvement works from Taiping to Padang Rengas are being undertaken. The completion of the double tracking of the rail line from Ipoh to Rawang is scheduled to be completed by late 2007. Rail infrastructure upgrading and improvements include other double tracking at selected priority stretches, rehabilitation of tracks and stations as well as the refurbishment and procurement of rolling stock. Efforts to enhance the performance and the productivity of ports are also being undertaken in the plan. To improve turnaround times at ports additional gantry cranes and other equipment will be purchased and cargo storage facilities will be upgraded. The approach channels into ports are being dredged to enable larger vessels access. Additional berths are being constructed in some ports, notably, West Port of Port Klang, Penang Port, and Kuantan Port. Both passenger and air cargo traffic growing in size and this will need airport expansion. This is also to be undertaken in the plan period, including expanding and upgrading Kuala Lumpur International Airport. It is also planned to upgrade air traffic control equipment in order to handle the expected increase in the frequency of flights. Malaysia has implemented various projects under IMT-GT, namely the:

- improvement of air linkages between towns in participating states and provinces. Among the air links that were established in the IMT-GT include flights between KLIA and Medan, Pekanbaru, Padang, Palembang and Hat Yai; between Pulau Pinang and Medan; and between Melaka and Pekanbaru.
- establishment of more sea routes in the IMT-GT such as Pulau Pinang-Belawan, Pulau Pinang-Kantang, Langawi-Satun, Melaka-Dumai and Melaka-Pekanbaru

3. Thailand's 10th National Economic and Social Development Plan

97. The 10th National Economic and Social Development Plan (2007-2011) prioritizes infrastructure development and improved logistics to enhance Thailand's competitiveness and support long-term growth. The Government of Thailand's infrastructure investment program over the medium term is a significant step toward closing the infrastructure investment gap.

98. Thailand's renewed focus on the need to invest in large-scale infrastructure projects can be seen in the cabinet approval in mid-2005 of a medium-term investment program of more than \$40 billion (roughly 5% of GDP) that will be used to finance highway, water supply, energy, housing, education, and public health projects. Nineteen-percent (19%) of this investment budget is intended for transport and highway improvements. There are four main sources for public sector funding: (i) the national budget; (ii) domestic borrowing; (iii) international loans; and (iv) SOE income, retained earnings, and other assets.

4. Joint Development Strategy for Border Areas (JDS)

99. Thailand and Malaysia have formed a committee on the Joint Development Strategy for Border Areas (JDS). The JDS, which was formed in 2004 during the bilateral meeting between the Prime Ministers of Malaysia and Thailand, is tasked to undertake joint planning and implementation of development projects along the border areas. The objective is to bring prosperity and improve the quality of life in the areas covering Perlis, Kedah, Kelantan, and Pengkalan Hulu of Perak in Malaysia and Satun, Songkhla, Yala, Narathiwat and Pattani in Thailand. The JDS Action Plan, which is the basis of cooperation was adopted in August 2004

covering nine priority areas namely, basic infrastructure and transportation, human resource development, tourism, culture, trade and investment, agriculture, finance, energy and disaster relief. Among the projects under the JDS initiated that were implemented was the initial works on the construction of the Customs, Immigration and Quarantine (CIQ) complex in Durian Burong, Kedah, which began in 2004. In addition a bridge linking Bukit Bunga in Malaysia with Buketa in Thailand was jointly planned with the costs being equally shared between Malaysia and Thailand. In the near future, projects that were identified in the Malaysia - Thailand JDS Action Plan will be accelerated. Three studies are also being undertaken on the establishment of a special economic zone at Bukit Kayu Hitam-Sadao and feasibility studies on the proposed bridge projects between Pengkalan Kubor-Tak Bai and between Rantau Panjang - Sungai Golok.

C. Other recommendations for IMT-GT Projects

100. A focus on infrastructure development in Sumatra is relatively of high priority for developing the proposed IMT-GT economic connectivity corridors. Critical issues include 1) *the growing infrastructure demand in Indonesia*, 2) *deteriorating quality of roads in Indonesia*, 3) *the need to develop a multi-modal transport system within IMT-GT*.

Growing Infrastructure Demand in Indonesia

101. The existing transport infrastructure in Sumatra is fast approaching the stage where it cannot cope anymore with the existing demand. Movements of goods to and from the ports are hampered by the existing bottlenecks in road transport infrastructure. Road traffic is increasing at between 5% - 7% per annum and the Trans-Sumatra eastern corridor will be approaching capacity levels within the next 5 to 10 years. The port at Belawan, and the ports at Banda Aceh, cannot cope with the increase in traffic. Port handling facilities, storage, depth of berths are all factors hindering their ability to handle traffic and therefore are a constraint on subregional trade, which as seen above, that although relatively small in the subregion is growing at a high rate. Without further investments in the Indonesia transport infrastructure network in Sumatra subregional trade will eventually decline. Improvements in the first instance need to be made to the existing infrastructure.

Deteriorating Quality of Roads in Indonesia

102. There are also other factors which must be considered in terms of the road network in Indonesia: (i) maintenance of existing infrastructure and (ii) enforcement of traffic regulations. The condition of roads is generally poor, which raises costs of transport both for inputs and for output. Part of the reason for the poor condition of roads is overweight freight vehicles, which caused heavy damage to roads and exacerbates the already poor road conditions. Thus budgetary planning for road maintenance is not sufficient for the actual maintenance needs when the roads deteriorate.

Developing Feeder Roads

103. Attention also needs to be given to developing feeder roads creating links to a wider hinterland and to opening smaller ports; otherwise the benefits of transport cooperation will not trickle down to the general population and the benefits of development goals will be unevenly distributed.

Developing a Multi-Modal Transport System

104. Two of the four economic connectivity corridors in IMT-GT are across the Straits of Melaka, and there is need therefore to enhance development of multi-modal transport links across the water. This will require port development as well as enhanced role of private sector in introducing efficient, reliable and sustainably profitable multi-modal transport links across Melaka Straits. Of particular concern in this context is the development of the road linking Pekanbaru to Dumai port in Sumatra.

105. Given the need for expansion of the transport infrastructure in Sumatra, specifically road and port facilities (rail connections also need to be improved to assist in the movement of freight to and from ports), and the large investments involved, it is important to develop in consultation with the GoI, a Sumatra Master Plan for transport infrastructure.

In addition, the study has also noted the need for further information and analysis to support future development of IMT-GT economic connectivity corridors. These are:

- Study of port development and maritime trade
- Study of transport costs and logistics development
- Survey of trade and investment constraints
- Development of an IMT-GT trade and investment database

106. Finally, the important role of the private sector should always be at the forefront of subregional cooperation initiatives in infrastructure connectivity. One major obstacle identified by the private sector as inhibiting its involvement in regional projects is the lack of a clear legal framework for its participation, covering ownership, corporate law, accounting practice, adequate flexibility regarding pricing and taxation. Government acceptance of risk-sharing between the public and private sector players is also important to attract private investment in such projects. There is a need to enhance policy dialog between government and private sector for development of the IMT-GT economic connectivity corridors, which may be started off with structure workshops around the region.

References

- ADB's Infrastructure Operations: Responding to Client Needs. R. Nag et al. March 2007. Asian Development Bank Manila (Diwesh Sharan, Bindu N. Lohan, Masahiro Kawai, Rajat Nag)
- Asian Development Bank (ADB) 2005. Asian Economic Cooperation and Integration. Progress, Prospects and Challenges.
- Asian Development Bank (ADB). 2005. Connecting East Asia: A new Framework for Infrastructure. Asian Development Bank, Japan Bank for International Cooperation, and World Bank. Manila.
- Asian Highway Handbook, 2003. Economic and Social Commission for Asia and the Pacific. United Nations. New York.
- Calderon, C. and K. Serven. 2005. The Effects of Infrastructure Development on Growth and Income Distribution. World Bank Policy Research Working Paper 3643, Washington, DC.
- Clark, Ximena, David Dollar and Alejandra Micco. 2006. " Port Efficiency, Maritime Transport Costs, and Bilateral Trade. *Journal of Development Economics* 75: 417-50
- De Groot, Henri L. F., Gert-Jan Linders, Piet Rietveld, and Uma Subramanian. 2004. " The Institutional Determinants of Bilateral Trade Patterns" *Kyklos* 57(1): 103-24.
- De, Prabir. January 2007. Impact of Trade Costs on Trade: Empirical Evidence from Asian Countries. Asia Pacific Research and Training Network on Trade, Working Paper Series, No. 27, January 2007.
- Draft Final Report: Strengthening Subregional Cooperation in the Transport Sector of EAGA and the IMT-GT Regions (ADB RETA 6013), January 2004
- Hausman, Warren, Lee , Hau, and Subramanian, Uma. November 2005. Global Logistics Indicators, Supply Chain, Metrics and Bilateral Trade Patterns. World Bank Research Working Paper No. 3773.
- Holst, David Roland, December 2006. Infrastructure as a Catalyst for Regional Integration, Growth and Economic Convergence: Scenario Analysis for Asia. ERD Working Paper Series No. 91. Asian Development Bank.
- Kakazu, Hiroshi, 1997. Growth Triangles in Asia a New Approach to Regional Cooperation. IUJ Research Institute Working Paper, Asia Pacific Series No. 9.
- Limao, Nuno, and Anthony J. Venables. 2001. " Infrastructure. Geographical Disadvantage, Transport Costs and Trade." *World Bank Economic Review*: 15:451-79.

Myo Thant and Min Tang (eds) Indonesia, Malaysia, Thailand Growth Triangle: Theory to Practice. Manila: Asian Development Bank. 1996.

Moon and Roehr. 2005 Chapter 11. Infrastructure Networks to External Regional Production Networks for Inland Sites in Asia, in ADB (2005) Asian Economic Cooperation and Integration.

Sakai, Minako and Morell, Elizabeth, _____. Reconfiguring the region and challenging the State? New socio-economic partnerships in the outer islands of Indonesia.

The Boao Forum for Asia Annual Report 2007.

Transcript of Keynote Address by President of The Republic of Indonesia at the Second Indonesia Infrastructure Conference, Jakarta Convention Center, 1 November 2006

Presentation of the Minister of Transportation at the Second Indonesia Infrastructure Conference, Jakarta Convention Center, 1 November 2006

APPENDICES

Appendix 1: Infrastructure Index of Selected Asian Countries

Economy	All		EII		SII		TII	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Bangladesh	0.47	17	0.66	15	8.32	16	0.57	15
Brunei	1.59	10	6.09	5	13.43	3	2.09	7
Cambodia	0.38	18	0.17	18	8.02	18	0.24	16
PRC	2.34	5	2.46	8	11.82	6	3.12	5
Hong Kong, China	1.76	7	10.27	3	13.34	4	4.28	4
India	1.83	6	0.84	12	9.73	13	2.20	6
Indonesia	0.86	16	1.05	10	10.46	12	0.59	14
Japan	6.33	1	12.37	1	15.82	2	8.08	1
Republic of Korea	4.17	3	9.27	4	16.12	1	5.95	3
Lao PDR	0.97	13	0.27	17	8.05	17	0.23	17
Malaysia	0.95	14	5.60	6	10.67	10	1.40	11
Myanmar	1.01	12	0.41	16	10.48	11	0.11	18
Pakistan	1.52	11	0.77	13	8.88	15	0.96	12
Philippines	0.91	15	1.44	9	11.51	8	0.67	13
Singapore	5.14	2	10.43	2	12.80	5	7.57	2
Sri Lanka	1.62	9	0.93	11	9.22	14	1.78	9
Thailand	1.63	8	2.53	7	11.70	7	2.06	8
Viet Nam	2.55	4	0.74	14	10.93	9	1.42	10

All=agriculture infrastructure index, EII=economic infrastructure index, SII=social infrastructure index, TII=transport infrastructure index, Lao PDR=Lao People's Democratic Republic, PRC=People's Republic of China.

Appendix 3: Proposed Projects of TA 5550-REG

Code	Title	Subregion Affected	Priority	Present Status (as of 2007)
TRCO-1	Institute a Special Telecommunication Zone in the IMT-GT	IMT	Immediate	WG (ITG) disbanded
TRCO-2	Develop an IMT-GT Air Linkage Agreement	IMT	Immediate	May become stable with technical progress
TRCO-3	Promote Thai-Malaysia Trucking/Bus Services	MT	Short – Term	Unknown
TRCO-4	Jointly Develop Padang Besar Container Terminal	MT	Immediate	Unknown
TRCO-5	Improve IMT-GT Shipping Services and Coastal Ports	IMT	Short – Term	Unknown
TRCO-6	Implement Rural Road Maintenance, Rehabilitation, Access, and Improvement Programs	I	Short – Term	Implemented
TRCO-7	Introduce Double Track on the Ipoh-Butterworth-Padang Besar-Hat Yai-Songkhla Railroad	MT	Short - Term Medium – Term	Unknown
TRCO-8	Construct Satun-Kuala Perlis Highway	MT	Immediate	Implemented
TRCO-9	Relocate and Upgrade Medan Airport	I	Medium – Term	Pending
TRCO-10	Institute Rolling Stock and Track Rehabilitation	I	Short – Term	Unknown
TRCO-11	Expand Container Service at Belawan Port	I	Short – Term	Implemented
TRCO-12	Provide Container Equipment for Lhokseumawe Port	I	Short – Term	Not done
TRCO-13	Extend the Langkawi International Airport Runway	M	Short – Term	Unknown
TRCO-14	Build a Malaysian-Thai Border Bridge at Ban Bhuketa	MT	Short – Term	Unknown
TRCO-15	Conduct a Study of Ban Gabang (Yala)-Sik (Kedah) Road	MT	Medium – Term	Unknown
TRCO-16	Build the Yala-Narathiway Highway	T	Medium – Term	Unknown
TRCO-17	Institute the Rural Roads Program	T	Short – Term	Implemented
TRCO-18	Build Landing Strips for Tourism	I	Short – Term	Unknown
TRCO-19	Connect the Thai-Malaysian Border Zone Roads	MT	Short – Term	Unknown
TRCO-20	Establish the IMT-GT Transport Planning Commission	IMT	Medium – Term	May be subsumed under Transport Working Group

Subregion Affected: I = Indonesia, M = Malaysia, T = Thailand

Priority: Immediate = 1994; Short – Term = 1995-1996; Medium – Term = 1997 – 2000

TA 5500-REG (1993)

TA 5500-REG (1993)

The other projects recommended include the:

1. Upgrading of trade and industrial infrastructure particularly Thailand and Malaysian border and the Medan-Belawan corridors in Indonesia
2. Enhancement of investment incentives (i.e. facilitating cross-border investment and harmonization of policies)
3. Mobilization of economic resources and development of special economic zone (Thai-Malaysian border development zone and North Sumatra-Northern Malaysia Joint Development Zone)
4. Joint Development of the Padang-Basar container terminal and Satun Kuala Perlis Highway.

Appendix 4: Transport Sector Project Recommendations 2003-2008 (TA 6013)

Project	Coverage	Time Frame	Present Status (as of 2007)
Land Transport			
Enhancement of CIQ Facility at the Wang Kelian (Perlis) – Wang Pracha (Satun) Border Crossing	MT	ST	
Enhancement of the CIQ Facility at Bukit Kayu Hitam (Kedah)	MT	ST	
Expansion of the Sadao Custom and Immigration in Songkhla	MT	ST	
Development of a New Border Crossing at Ban Pakob	MT	MT	
Improvement of Route No. 410 from Yala to Betong Border Crossing	MT	MT	
Development of the Expressway from Hat Yai to Sadao Border Crossing	MT	MT	
Satun – Wang Prachan/Wang Kelian – Perlis Highway Project	MT	ST	Ongoing, target date 2008
Repavement of the Existing Hat Yai – Sadao Road (Road No. 4)	MT	ST	
Maritime Transport			
Development of Barter Trading Facilities at Tanjung Lembong Port (Langkawi)	IMT	ST	
The Construction of a Deep Sea Port in Satun	MT	ST	
Expansion of Kuala Perlis Port	MT	ST	
Expansion of Maritime Services between I-GT and the National Subregions of Malaysia and Thailand	IMT	MT	
Air Transport			
Multilateral Exchange of Traffic Rights in the IMT-GT	IMT	ST	
Introduction of Budget Air Services in the IMT-GT subregion	IMT	ST-MT	

Coverage: I = Indonesia, M = Malaysia, T = Thailand

Time Frame: ST = Short-term 2003-2005, MT = Medium-term 2006-2008

Appendix 5: ADB Infrastructure Projects in IMT-GT

Indonesia. ADB has assisted the transport sector in Indonesia since 1975. ADB's total lending to the road sector amounts to \$1.57 billion for 15 projects, 14 of which have been completed. ADB has also provided grants totaling \$4.3 million. Total ADB loans to Indonesia amount to \$203.7 million, to finance port subsector development. These projects in the port subsector were effective and implemented satisfactorily. They were implemented without major cost overruns, although some delays in completion were experienced. In general, problems encountered were mainly delays in lengthy internal procedures, particularly for selecting consultants and contractors and approving contracts. Projects need to be complemented with appropriate policy, and work and institutional improvements to improve port efficiency and sustainability. To avoid delays in project preparation, early preparation of detailed engineering design would help the Government expedite project implementation.

ADB approved a port project in Belawan on 7 December 1978. The main objective of the project was to provide additional port capacity to handle the growing volume of sea freight traffic. The major components of the project were (i) dredging and reclamation works; (ii) construction of a new quay with five general cargo berths; (iii) paving of roads and port areas; (iv) construction of five transit sheds; (v) dredging between the access channel and the new berths; (vi) procurement of tugboats and pilot boats; and (vii) procurement of cargo handling equipment. In September 1997, ADB provided an additional loan for Belawan, Banjarmasin and Balikpapan Ports in the IMT-GT and BIMP-EAGA areas. For the Belawan port the project provided capacity expansion and operational improvements, particularly rehabilitation of the extensively deteriorated cargo berths and improvement to the dry cargo and palm oil loading systems; relocation of the passenger terminal and construction of one new passenger berth; and procurement of container-handling equipment.

In the road subsector, ADB presently has two ongoing projects, the Road Rehabilitation (Sector) Project (RRSP)²² and the Road Rehabilitation-2 Project.²³ In the RRSP civil works were the major component of the project. The civil works comprised of periodic maintenance for about 2,500 km of roads, road betterment (without land acquisition) for about 500 km, and about 3,000 linear meters of bridge rehabilitation or replacement. Specifically in Sumatra, the project covered the provinces of Riau, Jambi, Bengkulu, South Sumatra, and Lampung. Under the Road Rehabilitation-2 Project, the scope of works covers the rehabilitation of 1,292 km of roads through (i) the reconstruction of 60 km and resurfacing and widening of 593 km of the Trans-Sumatra eastern and central highways (of this work approximately 217 km is on the eastern highway), (ii) reconstruction of 371 km and resurfacing of 268 km of the Trans-Kalimantan Highway, and (iii) replacement of 21 timber and log bridges in Kalimantan and widening of 19 bridges in Sumatra. In Sumatra, the project covers the provinces of Jambi, Lampung, North Sumatra, South Sumatra, West Sumatra, and Riau.

Malaysia. ADB has undertaken several previous projects in Malaysia. In the roads sector the project relating to IMT-GT that was approved on 29 March 1973 was Loan No. 124-MAL: East – West Highway Project for \$9.3 million. The loan financed five major bridges on a new road linking Grik and Geli in the central part of northern Peninsular Malaysia. The bridges were completed in 1979 and the road works were open to traffic in July 1982. The road connections between Jeli and Pasir Puteh on the Eastern Section and between Grik and Butterworth on the Western Section needed upgrading to cater for the transport demand and to support the Governments development program for the less-developed states of Kelantan and Kedah. A study was undertaken on the feasibility of these sections and completed in July 1979. In March 1980 the ADB responded to a Government request to approve a TA to review and update the feasibility study. The Government accorded higher priority to the upgrading of the Eastern Section. ADB approved in October 1982 a loan for \$15.0 million, Loan No. 588 for the second phase of the E-W Highway Project. The Government of Malaysia used its own resources to complete the Western Section of the road.

ADB has also provided two loans for the development of Penang Port i.e. Loan 184-MAL for the Penang

²² ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Republic of Indonesia for the Road Rehabilitation Sector Project*. Manila, Loan 1798-INO, approved in December 2000, for the amount of \$190 million.

²³ ADB. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Republic of Indonesia for the Road Rehabilitation-2 Project*. Manila, Loan 2184-INO, approved in September 2005 for the amount of \$151 million.

Port Expansion Project amounting to \$15.1 million approved in April 1974 and Loan No. 296-MAL for the Second Penang Port Expansion Project amounting to \$10 million approved in March 1977. The First Project related to Phase I expansion of the port included construction at Butterworth of a general cargo wharf (Berth No. 6), a bulk cargo terminal and erection of a transit shed. Due to changing cargo trends the Second Project was formulated for the Phase II expansion of the port to include the conversion of Berth No. 6 at Butterworth from a general cargo wharf to a container cum roll-on/roll-off berth and the construction of a vegetable oil berth adjacent to Berth No. 1.

Thailand. ADB approved a loan for \$71.4 million on 25 November 1981 for the Songkhla and Phuket Ports Project. The Project involved the construction and development of deepwater port facilities at Songkhla and Phuket and the construction of two road bridges with a connecting road to enable freight traffic to bypass the town of Songkhla. Project development at Songkhla included (i) dredging a 4 km approach channel and port basin; (ii) construction of a 510 m quay suitable for berthing vessels of about 10,000 dead weight tones; a 300 m breakwater; a 350 m causeway; and transit / storage shed facilities; and (iii) provision of paving, port vessels, and navigation and cargo handling equipment.

Appendix 6: Fieldwork Observations on the Status of IMT-GT Transport Infrastructure

Transport Modality Type/Name	Description	Current Condition/Status
Indonesia		
ROADS in Indonesia		
<i>Trans-Sumatra Eastern Highway</i>	Highway from Bandar Lampung-Palembang-Jambi-Pekanbaru-Medan-Banda Aceh	<ul style="list-style-type: none"> Condition of the road varies from poor to good throughout the length of the road (IRI 2.5-IRI 10.0). Traffic volumes increase as one travels from the south to north Sumatra.
PORTS in Indonesia		
<ul style="list-style-type: none"> The Gol Ministry of Transport have plans to undertake the development and improvement of several main seaports in Belawan, Dumai, Bojonegara, Tanjung Priok extension, Makaassar, Banjarmasin, Balikpapan, Bitung, Jayapura and building more inter-island vessels and ferries to cater to industry's growing needs. 		
<i>Belawan Port</i>	Located Near Medan. Main general port in Sumatra and 2 nd largest general port in Indonesia. Port handles more export goods than import.	<ul style="list-style-type: none"> Approximately 35,000 TEUs per month are handled at the port—an amount that is beyond the capacity of the container yard. Outdated container port equipment. Several projects undertaken by ADB in improving capacity and equipment Gol Ministry of Transport have plans to undertake the development and improvement of the Belawan Port
<i>Dumai Port</i>	Port along the Straits of Melaka	<ul style="list-style-type: none"> Port improvements such as dredging and addition of new berths have been undertaken by JBIC Plans are also being made for the establishment of a container terminal at the port. The loan has been extended until November 2008 due to delays in moving the navy jetty.
<i>Uhleelee</i>	Port near Banda Aceh	<ul style="list-style-type: none"> Passenger Terminal Project by AusAid in progress
AIRPORTS in Indonesia		
<ul style="list-style-type: none"> Gol Ministry of Transport Plans to undertake the development, extension, and modernization of several main airports such as the Hasanuddin Airport, New Lombok Airport and new Medan Airport, in order to facilitate the fast growing air passengers of more than 20% per year. There are project plans to extend runways and improve Instrument Landing Systems (ILS) for most airports. There are project plans on strengthening and modernizing the domestic and international air carriers 		
<i>Polonia Airport in Medan</i>	Accredited international airport and main airport in the region	<ul style="list-style-type: none"> Can handle planes up to B-747 Outdated equipment and facilities. Has only one runway Space limitations in current densely populated location do not allow further expansion Current plans to construct a new

Transport Modality Type/Name	Description	Current Condition/Status
		Medan airport about 30 km from Medan are underway (master plan and engineering design are completed) <ul style="list-style-type: none"> • Donor discussions are held for possible funding (i.e. ADB and JBIC).
<i>Padang Airport</i>	Relocated in Aug 2005 Has a runway of 2,750 and can handle Airbus 330's.	<ul style="list-style-type: none"> • JBIC funded
<i>Palembang Airport</i>	Expanded in Oct 2005 and included facilities for cold storage, a relocated passenger terminal and an extension to the runway. Runway of 2,500 m and can handle 747 aircrafts.	<ul style="list-style-type: none"> • JBIC funded
<i>Bandar Lampung Airport</i>		<ul style="list-style-type: none"> • Expanded in 2005. • Runway length of 2,500 m
RAILWAYS in Indonesia		
<ul style="list-style-type: none"> • Development for Double-Double track (DDT) for main busy network in some areas (i.e. through Java island) • Development of Train Network in Sumatera and Kalimantan 		
<i>North Sumatera Railway System</i>	Built by the Dutch to provide transport for the plantations and connects areas with the harbor in Belawan. Stretches 1052 km	<ul style="list-style-type: none"> • There are plans to extend the system to serve post independence plantation areas. • Average length of passenger journey: 140 km. • Average freight haul: 200 km
<i>West Sumatra Railway System</i>	Built by the Dutch to link coal mines with ocean ports	
<i>South Sumatra Railway System</i>	Built by the Dutch to link coal mines with ocean ports. Connects to the port of Bandar Lampung	
Malaysia		
ROADS in Malaysia		
<i>Malaysia Road Network</i>	Well developed road network	
<i>Federal Route 1</i>	Single carriageway highway	
<i>North-South Expressway (NSE)</i>	Controlled access, dual-carriageway highway from Bukit Kayu Hitam to Singapore (890 km)	

Transport Modality Type/Name	Description	Current Condition/Status
PORTS in Malaysia		
<i>Port Klang</i>	Largest port and main sea gateway to Malaysia. Major shipping and cargo terminal	It is still a major shipping and cargo terminal. <ul style="list-style-type: none"> Additional berths are being constructed in the West Port of Port Klang
<i>Penang Port</i>	Strategically located along the Northwest coast of Peninsula Malaysia. Among the busiest trade routes in the region. Links Malaysia to more than 200 ports worldwide. The North-South Highway, spanning the west coast of Peninsular Malaysia from the Malaysia-Thailand border to the Malaysia-Singapore border, makes this port accessible to all major economic regions in Malaysia..	<ul style="list-style-type: none"> Linked directly with east coast of Peninsular Malaysia via the East-West Highway. There are plans for expansion over the next 5 years (i.e. additional equipment, dredging and increasing the number of berths) Land reclamation of around 25 hectares is underway. 15% of the total traffic in Penang port is from Thailand. Additional berths are being constructed
AIRPORTS in Malaysia		
<i>Penang International Airport</i>		The Ninth Malaysian Development Plan has made provisions for expansion of all airports to cater for the increase in demand.
<i>Langkawi International Airport</i>		
<i>Kepala Batas Domestic Airport</i>		
RAILWAYS in Malaysia		
		<ul style="list-style-type: none"> The 9th Malaysia Development Plan has several provisions for rail improvements Rail infrastructure upgrading and improvements include other double tracking at selected priority stretched, rehabilitation of tracks and stations as well as the refurbishment and procurement of rolling stock.
<i>Taiping to Padang Rengas</i>		<ul style="list-style-type: none"> Rail improvements on track and realignment improvement works are underway
<i>Ipoh to Rawang</i>		<ul style="list-style-type: none"> The completion of the double tracking of the rail line from to be completed in 2007
Thailand		
ROADS in Thailand		
<i>Provincial roads</i>		<ul style="list-style-type: none"> Most provincial roads are in good condition
<i>Rural Roads</i>		<ul style="list-style-type: none"> Rural roads are in poor condition (poor access and poor maintenance)

Transport Modality Type/Name	Description	Current Condition/Status
		<p>(i.e. road from the border of Thailand and Malaysia at Sadao going towards Hat Yai is in poor condition and heavily congested.</p> <ul style="list-style-type: none"> • High volume of traffic • There is a proposal for an expressway to be setup between Sadao and Hat Yai parallel to the existing road.
PORTS		
<i>Songkhla Port</i>	<p>Can handle vessels alongside with a maximum draft of 8.23 m at 3 berths. Total port area is 115,000 sq m suitable for large ocean-going cargo vessels. Access to the port is via an asphalt-paved concrete causeway from either Highway 408 from Nakhon Si Thammarat Province or Highway 407 from Hat Yai crossing over the Tinasulanonda Bridge. Access of vessels is via a 120 m wide channel dredged to a depth of 9 m below Chart Datum (CD) and with a length of 4 km. There is a 300m turning circle at the western end of the quay.</p>	<ul style="list-style-type: none"> • The container yard is currently stacked up to 5 containers high due to limited space. • Port is equipped with modern equipment. • A feasibility study which is expected to be completed by September 2007 has been conducted on a second port, designated as Songkhla Port (Phase II). • A detailed design and environmental study will be conducted, after the feasibility study's completion.
<i>Komtang Port</i>		<ul style="list-style-type: none"> • Undergoing improvements • (THB 60 million for port expansion)
<i>Tammalung Port and Customs Port</i>	<p>Constructed to serve cargo vessels up to 400 deadweight tonnage (DWT). Due to channel depth of only 4 m, not suitable for ro-ro vessels, the port does not have much development potential for IMT-GT trade.</p>	<ul style="list-style-type: none"> • Due to limitations on channel depth of less than 4 m and the existing quay length, which is not suitable for accommodating ro-ro ferry vessels, the port does not have much development potential for IMT-GT trade.
<i>Paak Bara Port</i>	<p>This new port is primarily intended to serve international trade between Thailand and South Asia, Middle East and Europe.</p>	<p>The detailed design and environmental study are still being conducted. The Minister of Transport has asked for an additional study to review the port demand to ensure justification of port construction. Construction is expected to</p>

Transport Modality Type/Name	Description	Current Condition/Status
		<p>start in 2009 (at the earliest) and will take about 4 years. The long construction period is due to the need for the reclamation of the sea area.</p> <p>To cut transport costs of products such as rice, para rubber, etc. to European countries, the India subcontinent, Middle East, and Africa, the new deep sea port of Paak Bara (Lagoo district of Satun) would cost approximately THB5.6 billion. This will cut transportation costs by THB269 million a year. The advantage of Paak Bara over Phuket and Phang Nga deep sea port is that Paak Bara could accept larger ships (50,000 ton DWT) since Paak Bara is 13 m deep which could be easily upgraded to 25 m deep, and Paak Bara is only 150 miles away from international routes inside the Straits of Melaka.</p>

Source: Observations from the field trip throughout the IMT-GT Economic Corridors

Appendix 7: SUMATRA EASTERN HIGHWAY





Appendix 8: List of Persons Met

Indonesia

Ms. Lilien Ambarwiyati, Deputy Director, International Air Transport, Medan

Puspo Arianto, Deputy Director for Area Development, Directorate General of Spatial Planning, Jakarta

Mr. Adi Prastion, Directorate General of Highways, Road Development Section, Jakarta

Ms. Ir. Nurlisa Ginting, Vice Chairman, Investment and Promotion Board, Medan

Mr. Pieter M. Smidt, Head of Extended Mission in Sumatra, ADB

Mr. Rehan Kausar, Earthquake and Tsunami Emergency Support Project, ADB

Mr. Aminul Huq, Earthquake and Tsunami Emergency Support Project, ADB

Mr. Wayan, Plan and Operational Control Assistant Manager, Belawan Port

Mr. Sugimulyo, General Manager, Unit Terminal Belawan Port

Mr. Harryson Bangun, Unit Terminal Belawan Port

Mr. SriSuyono, Belawan Port

Mr. SabarTarigan, Operations Manager, Polonia Airport, Medan

Mr. David Lawrence, Coordinator, International Finance Corporation, Banda Aceh

Mr. E. Purwanto, Chief Operating Officer, Rehabilitation and Reconstruction NAD-Nias Executing Agency, Banda Aceh

Mr. Said Faisal Baabud, Deputy for Economy and Business, Rehabilitation and Reconstruction NAD-Nias Executing Agency, Banda Aceh

Mr. Firmandez, Chairman, Aceh Chamber of Commerce and Industry, Banda Aceh

Dr. T. Raiful, Provincial Marine and Fisheries Agency, Banda Aceh

Mr. Nur Isnin Istiartono, Head Of Planning Division, Directorate General of Air Communications, Jakarta

Mr. Umar Zunaidi, Deputy of Institute of Highway and Bridges, North Sumatra.

Mr. Ibnu S. Hutomo, Chief of Sub-Directorate of Public Works Department, Medan

Mr. T. Vistarini, Economist, AusAID

Ms. Farzana Ahmed, Advisor Loan Programs, AusAID

Mr. Go Denda, Representative in Jakarta, Japan Bank for International Cooperation

Mr. Nobutaka Tanimoto, Representative in Jakarta, Japan Bank for International Cooperation

Ms. Michino Yamaguchi, Representative in Jakarta, Japan Bank for International Cooperation

Malaysia

Ms. Nortlaila Ibrahim, Corporate Manager, Penang Port Commission

Mr. Mohamad Radzuan Bin Mazlan, Principal Assistant Secretary, International Unit, Ministry of Transport, Malaysia

Mr. Saiful Anuar Hussen, Principal Assistant Director, Regional Economics Section, Economic Planning Unit, Malaysia

Thailand

Mr. Anothai Udomsilp, Director, General Affairs Division, Office of Tourism and Development, Bangkok

Mr. Nonglak Wongsuksiridacha, Director of International Transport Division, Department of Land Transport, Bangkok

Mr. Kamolwan Nantapetch, Director, International Affairs Division, Marine Department, Bangkok

Mr. Somkiat Anuras, Chairman, IMT-GT Business Council, Thailand

Mr. Olarn Uyakul, Chairman, Federation of Thai Industries, Thailand

Mr. Anusit Kanjanapol, Sadao Customs House, Thailand

Mr. Kittip[ol Chotipimai, Senior Economist, Office of the National Economic and Social Development Board, Thailand

Mr. Seksom Churangarit, Civil Engineer, Department of Public Works and Town and Country Planning, Thailand

Mr. Wathanachai Raunglertpanyakul, Deputy Port Director, Songkhla Port, Thailand

Ms. Lingling Ding, Senior Regional Economist, Thailand Resident Mission, ADB