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Appropriate economic space for transnational infrastructural projects: Gateways, multimodal corridors, and special economic zones

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Appropriate Economic Space for Transnational Infrastructural Projects: Gateways, Multimodal Corridors, and Special Economic Zones

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Abstract

This study addresses three questions that arise in Asia when formulating, financing, implementing, and maintaining transnational linkages versus purely domestic connections. Firstly, how is optimal economic space to be defined as a useful starting point? Secondly, how can relevant criteria be developed to define the emerging spatial economy and identify efficient transnational transport networks? Thirdly, what are the main investment opportunities in physical infrastructure that would result in more efficient and effective regional cooperation and integration (making special reference to the potential role of cross-border special economic zones (SEZs) or their equivalents)?

JEL Classification: R00, R10, R30, R40, R50

Contents

1. Introduction 1

2. Defining Appropriate Economic Space 1

3. Gateways And Multimodal Corridors 6

4. Special Economic Zones 16

5. Conclusions 23

References 26

Annex: Exploring Trans-Asia Networks 31

1. INTRODUCTION

The difficulties in determining investment priorities arise in large part from the problem of externalities, i.e., large divergences between private and social costs/benefits. An important externality that is often overlooked in a narrow domestic calculus is the costs and benefits of improved transnational linkages. The Asian Development Bank (ADB) rightly sees potential for strengthening regional social and political ties within Asia through cross-border corridor development as a step towards building an Asian economic community (Kuroda, 2006). Some would go further and suggest that regionalism is a matter of survival for Asia in a tri-polar world alongside Europe and the United States. There may be important non-economic benefits of regionalism beyond raising national income and reducing poverty. Thus greater weight may be given to regional cooperation and regional projects than would be consistent with purely economic goals.

Nevertheless, there are pitfalls in taking a partial approach to externalities. A proper calculus for setting investment priorities must still take account of all large externalities, not merely those that happen to be in current fashion (e.g. air and water pollution, and congestion). As the dialogue on trade liberalisation is coming to recognise, 'behind-the-border' externalities sometimes outweigh those 'at-border'. For most international air and sea movements, main cities are the border and their functional efficiency or lack thereof has a great impact upon logistic costs. Too narrow a focus on land-border infrastructure may risk a double misallocation of resources stemming from neglect of both vital urban infrastructure projects and more modest but no less essential infrastructure in rural areas, which are the source of food and raw materials. Unfortunately, few countries are thorough and transparent in determining national infrastructure priorities and funding because of lack of data and expertise, opportunism, and politicking. Yet the clear evidence of endemic congestion, pollution, and flooding in large cities and rising real prices for food and raw materials points to massive diseconomies of agglomeration.

To assess transnational externalities specifically, it is necessary first to determine the appropriate economic space and the emerging spatial pattern within it. Here the term 'appropriate' economic space may be more apt than the static one of 'optimal' economic space. The latter is hard to apply in the situation of rapid growth and structural change occurring within a diverse Asian realm stretching from the Pacific Islands in the east to the Black Sea in the west. More important, however, is the *nature* of economic space. This should be envisaged as highly contoured with the dominant economic zones being large cities, which are also gateways to the wider world. These gateways are integrated with the international economy by flows along corridors. Where land corridors traverse international boundaries, they may be identified as locations for cross-border special economic zones (SEZs) that could enhance greater Asian regionalism.

Within this broad policy context, this paper elaborates the characteristics of economic space by depicting its unbounded, uneven, sometimes discontinuous, and multidimensional character. Then the spatial planning tools of gateways and multimodal corridors are outlined and applied to Mainland Southeast Asia, Island Southeast Asia, and the Pacific Islands. The efficiency and effectiveness of cross-border special economic zones are assessed in terms of their potential role in deepening Asian integration before contemplating the post-Kyoto effects of fuel pricing on the split between different transport modes.

2. DEFINING APPROPRIATE ECONOMIC SPACE

Spatial analysts have shied away from defining *optimal* economic space. Roger Vickerman (1980: 165) states that "the search for optimality in models of spatial economies is probably as fruitless as that for optimality in the economies themselves" because the models are too restrictive or too simple. As "optimal spatial planning is not a practical proposition in

operational terms", he suggests that rather than "start with the rigid framework of equilibrium" the task is "to build up our picture of the spatial economy by a detailed consideration of the interactions and linkages between decisions and decision-makers."

Almost three decades later, Vickerman (2007, pers. comm. 2008) admits that there is a better understanding of the impact of infrastructure on regional economic cooperation, but his basic message is still valid: do not assume that investment in infrastructure will solve all problems. What Vickerman omits to say, however, is that it does not make sense to try and identify 'optimality' in the conditions of rapid growth and structural change that pertain across Asia. All that can be done is to determine whether a particular economic space is *appropriate* for the purpose at hand.

National governments use cost/benefit analysis to rank spending priorities, including where to locate investment, what kind of investment, and how much investment. The problem is that the usual national calculus omits cross-border effects or externalities (spillovers) and underestimates the potential of trade and foreign direct investment.[1] This gives rise to a problem of negative externalities or spillovers.

In large countries such as the People's Republic of China (PRC), India and Indonesia, international spillovers are apparent only in their border areas. In smaller countries, however, spillovers have a proportionately larger effect. Apart from the tiny Pacific Island economies, this is also the case, for example, in Singapore, Malaysia, and Cambodia. Thus, the key issue is not *optimality* but what is *appropriate* to the case in question—Mainland Southeast Asia, Island Southeast Asia or the Pacific Islands.

These instances are sufficient to highlight that a 'seamless' Asia is a long way from realization. Asia is not only separated by oceans and deserts, and split by different cultures and linguistic groups, but it is also divided by national boundaries. The boundaries are points at which political jurisdictions change and where international transit trade data are collected. They are associated with barriers to the flow of goods, not only stemming explicitly from tariffs and quotas, but also arising implicitly from inconsistent standards and irritations linked with border crossings. However, these boundaries pose obstacles to trade even where no formal barriers exist (Fujita, Krugman and Venables, 1999). National boundaries also pose obstacles to movements of people that persist well after formal barriers to trade in goods have been lowered.[2] Even if we dispensed with national borders and considered trade flows across unbounded economic space, distinct regions of industrial specialization would still evolve of their own accord and exhibit a distinct centre and periphery (Fujita pers. comm., 1999).

Urban agglomeration is becoming increasingly important due to the globalization of the world economy. The process is examined as a general equilibrium analysis between agglomeration economies stemming from inter-firm linkages and agglomeration diseconomies arising from immobile factors. Specifically, Masahiko Fujita, Paul Krugman and Anthony Venables (1999) give special attention to the impacts of increasing returns and degree of interactive activity, and the effects of transport and communications costs on urban concentration and dispersion. As outlined in Figure 1, the main findings of their theoretical exercise are that tensions between centrifugal and centripetal forces shape the spatial economy.[3]

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1 Besides cross-border trade, opportunities exist for co-production, land-based tourism and integration of infrastructure services. Successful implementation requires political will and goodwill; hardware (infrastructure); software (streamlined competitive procedures, facilitation in cross-border movement of goods and people); and stronger organizations and better governance (ADB, 2005).

2 Even the Canadian-USA border has a huge impact, although the 20:1 differences between inter-provincial exports in Canada reported by McCullum (1995) have been reduced.

3 Centrifugal forces, promoting the spatial concentration of economic activity, are linkages, thick markets, knowledge spillovers and other pure external economies; centrifugal forces, opposing such concentration, are immobile factors, land rent/commuting, congestion and other pure diseconomies (Fujita, Krugman and Venables, 1999: 9 and 346).

1. The dispersion of firms arises when transport and communication costs are sufficiently low and immobile factors such as land and, in some cases, labor are important centrifugal forces.

2. Structural transition from dispersion to concentration occurs when transport and communication costs rise to intermediate levels and firms engage in backward and forward linkages to create the circular logic of agglomeration (i.e., producers want to locate close to their suppliers and customers).

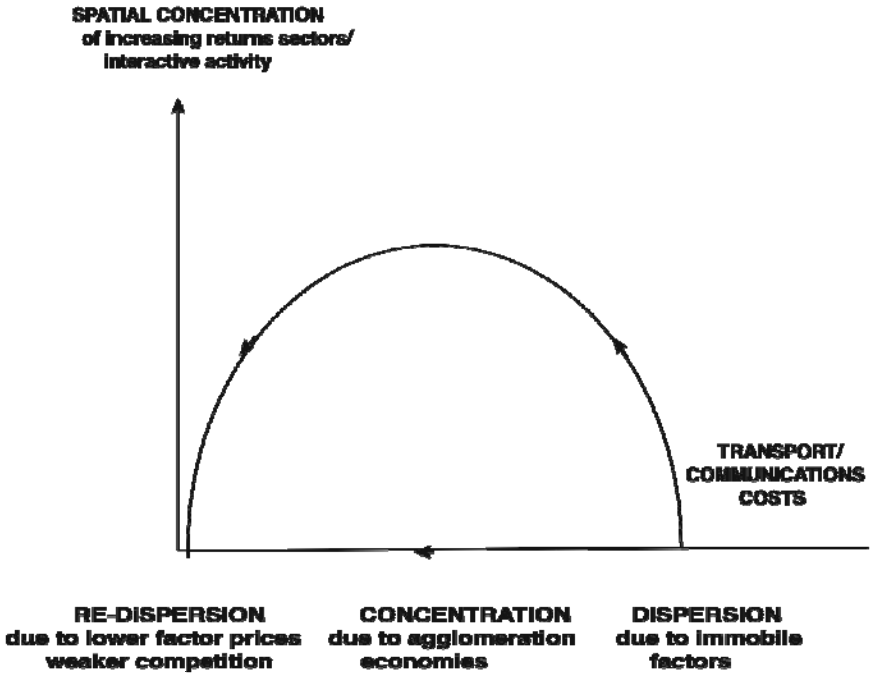
3. The re-dispersion of firms (i.e. deconcentration and decentralization) occurs when transport and communication costs have declined sufficiently over time to allow easy access to other firms and consumers, and agglomeration is no longer important due to lower factor prices and weaker competition.

Even when transport and communications costs fall, the spatial structure marked by agglomeration may persist over decades due to interdependence between the locational decisions of firms.

The welfare and policy implications of urban concentration and dispersion are addressed by Takatoshi Tabuchi (1998) after synthesizing William Alonso's (1964) work stressing intra-city transport costs and Paul Krugman's (1991) paper emphasizing inter-regional transport costs, Tabuchi sees agglomeration policies as being desirable in the process of urbanization, but unnecessary in the case of re-dispersion, which is attained without government intervention (see also Krugman, 1995). Where interregional transport costs are high, it follows from a social welfare viewpoint that dispersion is worse than agglomeration and that a decentralization policy, often conducted in regional planning, is not justified.

As Asia becomes more integrated and when critical thresholds are reached, falling transport costs may trigger an abrupt change in economic geography, disrupting any temporary equilibriums that may have been attained. As in the recently emergent PRC, shifts in regional specialization would be prompted, leading to the coalescence of new economic regions. Should transport costs fall, changes in the distribution of industry between centre and periphery, or a reversal of their respective positions, may occur.

Figure 1: Agglomeration diagram showing non-linear impact of transport and communications development on the spatial concentration of increasing return sectors and interactive activities



Source: Revised version of Masahisa Fujita, personal communication, 1999

Economic space is not only unbounded but is also uneven as reflected in the concentration of flows in corridors between main cities; multi-dimensional in the sense that there is an array of air, sea, land, tele- and financial spaces that have to be integrated; and, discontinuous with city cores linked by telecommunications being more adjacent economic spaces than physical hinterlands (see Box 1). These observations underline the significance of urban hubs and (international) inter-city corridors. It is important not to become too preoccupied with cross-border land crossings and to focus on inter-city connections. Rural areas do not aggregate demand for airlines, container ships and telephone traffic; their place in the articulation of national and international networks involves the collection and distribution of commodities at thin densities of traffic and hence imposing only modest demands on infrastructure.

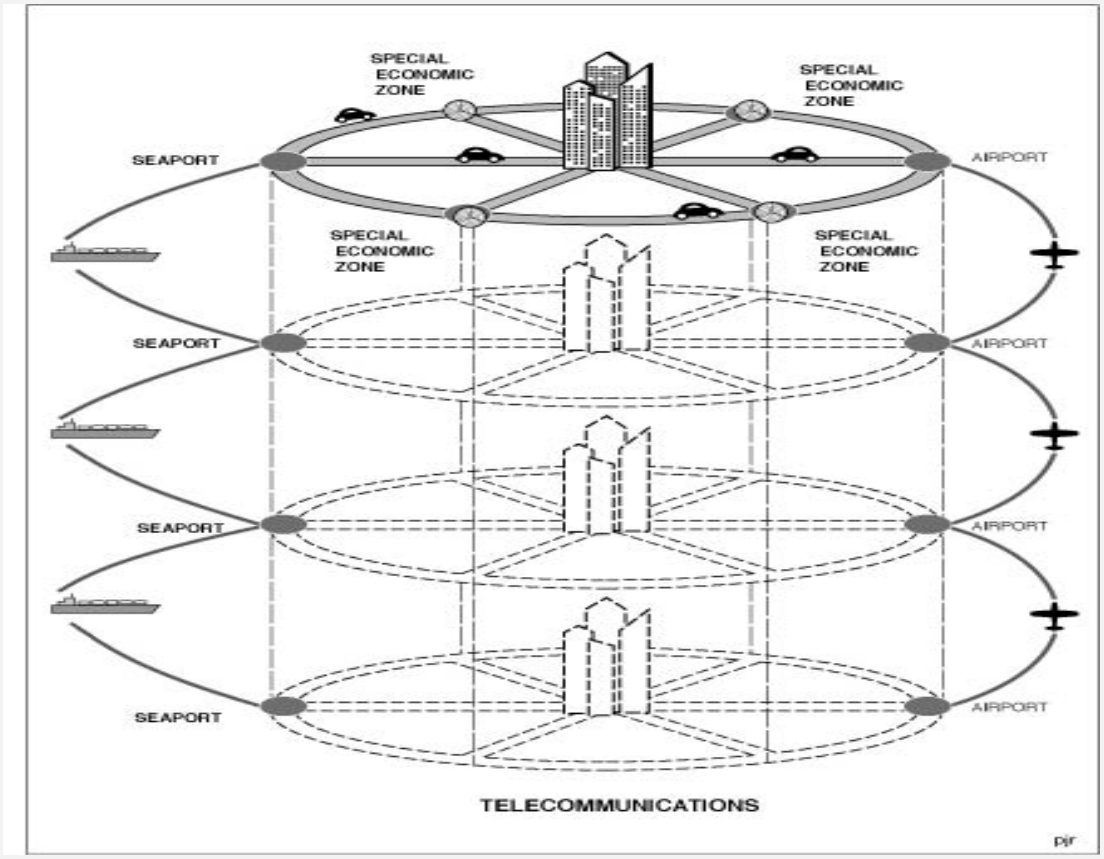
In Asia the capital or main cities are the largest agglomerations of economic activity and the main generators of cross-border flows, primarily because market forces are irresistible and largely impervious to any government attempts to slow them down. A policy of re-dispersing activities from these cities is very difficult to promote because it runs counter to market forces and takes decades to realize. In short, it is seldom possible to develop a new main city in a place chosen by policymakers. Removal of price or investment distortions will correct imbalances between capital or main cities, small towns and rural areas. However, as illustrated by Ben Higgins and Donald Savoie (1995) in regard to Malaysia, planners have had little success in altering the spatial distribution of economic activity to accord with the stated goals of national policy. Rather than leave the location of spread effects to the market, letting them occur where they would without intervention, planners sought, ineffectually, to direct them to certain areas to benefit particular societies.

BOX 1 CHARACTERISTICS OF ECONOMIC SPACE

Economic space is *uneven*. This is reflected in the disposition of contours and gradients on economic potential maps that give rise to corridors where flows converge. While every village is in some way connected into national transport and telecommunications systems, the density of flows increases markedly between towns and cities, especially between main cities. Most significant cross-border movements are between main cities and their ports, except in the case of raw materials. Corridors for the most part are inter-city flows.

Economic space is *multi-dimensional* or, in conventional jargon, multimodal. However, land space, air space, sea space, tele space and financial space are all different dimensions. Collectively, they constitute what has been described as the 'space of flows' (Castells, 1996: 376-428). But corridors are not necessarily multimodal or, at least, only partially so. The issue here is one of integration.

Economic space may also be *discontinuous* but this phenomenon is not so widely acknowledged. Telecommunications not only transcend economic space but also bring the business cores of major cities into instantaneous contact. As shown, the spatial outcome is that these essentially similar city-cores are stacked pancake-like on top of each other (see Dick and Rimmer, 2003: 343). In some respects, the cores of Bangkok, Beijing, Hong Kong, Jakarta, Kuala Lumpur, Manila, Singapore and Tokyo are more adjacent economic spaces than their physical hinterlands.



Instantaneous telecommunications between city-cores has produced a 'pancake-like' structure (*Source*: Based on Dick and Rimmer, 2003: 343).

These observations do not mean that all available resources should be poured into capital or main cities.[4] The proposition reflects that on the whole capital or main cities, with the exceptions of Singapore and Kuala Lumpur, suffer from public underinvestment. Private investment has been focused on shopping malls rather than infrastructure (Rimmer and Dick, 2008). Many cities have had no major infrastructural additions since the colonial era, and the city and its networks have been overwhelmed by the consequences of rapid economic growth. The history of the world suggests that urbanization goes in tandem with industrialization.

The capital or main cities in Asia have coalesced with industrialization. Since the 1980s industrialization has shifted the economic centre of gravity away from extensive agricultural hinterlands to the main cities (Dick and Rimmer, 2003). Since then the immediate hinterland and associated economies of agglomeration have transformed the main cities into extended metropolitan regions typified by Greater Bangkok, Greater Jakarta and Greater Manila. Not only are these mega-city regions once again closely linked with the world economy but they are much less dependent on their agricultural hinterlands, becoming the new enclaves. In turn, the main cities are also the gateways that may constitute a high proportion of national economies (e.g. Bangkok in Thailand, Manila in the Philippines and Kuala Lumpur in Malaysia) and are the focus of multimodal corridors.

3. GATEWAYS AND MULTIMODAL CORRIDORS

Gateways and multimodal corridors are the building blocks for creating an Asian spatial economy in which competitiveness is advanced by efficient, safe and secure transport systems that support the region's success in the rapidly changing world of international commerce. Essentially, gateways and multimodal corridors are major systems of marine, road, rail, and air transportation infrastructure of regional significance for international commerce located within a defined geographical zone (see Box 2 and Annex). They are discussed here by reference to cross-border infrastructure derived from bilateral or multilateral cooperative agreements designed to strengthen regional connectivity by broadening economic opportunities between countries in Mainland Southeast Asia, Island Southeast Asia and the Pacific Islands, to permit greater accessibility to resources, technology, and knowledge (Kuroda, 2006: 1).

Gateways have been added in Figure 2 to the seven multimodal transport corridors identified by Japan External Trade Organization (JETRO, 2007) as reflecting Japanese business interests in Mainland Southeast Asia and Island Southeast Asia: Singapore-Bangkok, Bangkok-Hanoi, Bangkok-Yangon, Bangkok-Ho Chi Minh City, Hanoi-Hong Kong/Guangzhou, Singapore-Jakarta and Bangkok-Manila. Three other corridors that are key to an understanding of the regional economies have been added: the Bangkok-Kunming-Hanoi corridor, the Singapore-Manila corridor, and the Singapore-Hong Kong, China corridor. Conversely, gateways and multimodal corridors have less currency in planning frameworks designed to develop regional integration between the island economies of the Pacific through the provision of cross-border transport and communications infrastructure.

4 The issue is how to balance urban and rural investments. Urban is not necessarily bad, rural necessarily good. In Australia much money has been wasted on unnecessarily fine rural roads in the vastness of Western Australia when only in 2010 is a dual highway nearing completion between the two main agglomerations of Sydney and Melbourne.

BOX 2 GATEWAYS AND MULTIMODAL CORRIDORS

Gateways and multimodal corridors need to be distinguished from modal corridors and hubs

A *modal corridor* is provided by a single mode. Generally, goods and people move by sea, inland waterway, air, rail, or road corridors and information by telecommunications corridors.

A *hub* is an articulation point offering intra-modal connections that permit transfers and transhipments (e.g. seaport, river port, airport, rail terminal, road depot or teleport).

Establishing an efficient hub-transport corridor network is a key element in the development of both on-the-ground and air-based systems. In examining linear ground-based systems with defined end-points, a large area needs to scanned, as illustrated by Australia's East Coast Transport Corridor scoping study (AG, 2001), to identify possible rail corridors offering the most direct connection between hubs of high existing and projected demand with provision for intra-modal facilities. Where transport corridors traverse borders, they become bi or tri-national trade channels for which various cross-border interests group together to develop or consolidate the infrastructure.

The integration of these separate systems of hubs and modal corridors requires definitions of gateways and multimodal corridors.

A *gateway* is a multimodal entry or exit point (i.e. a collection of hubs) through which goods and international passengers move beyond local and regional markets. Its intermodal function is to articulate the regulation of movements of people and goods through gateways.

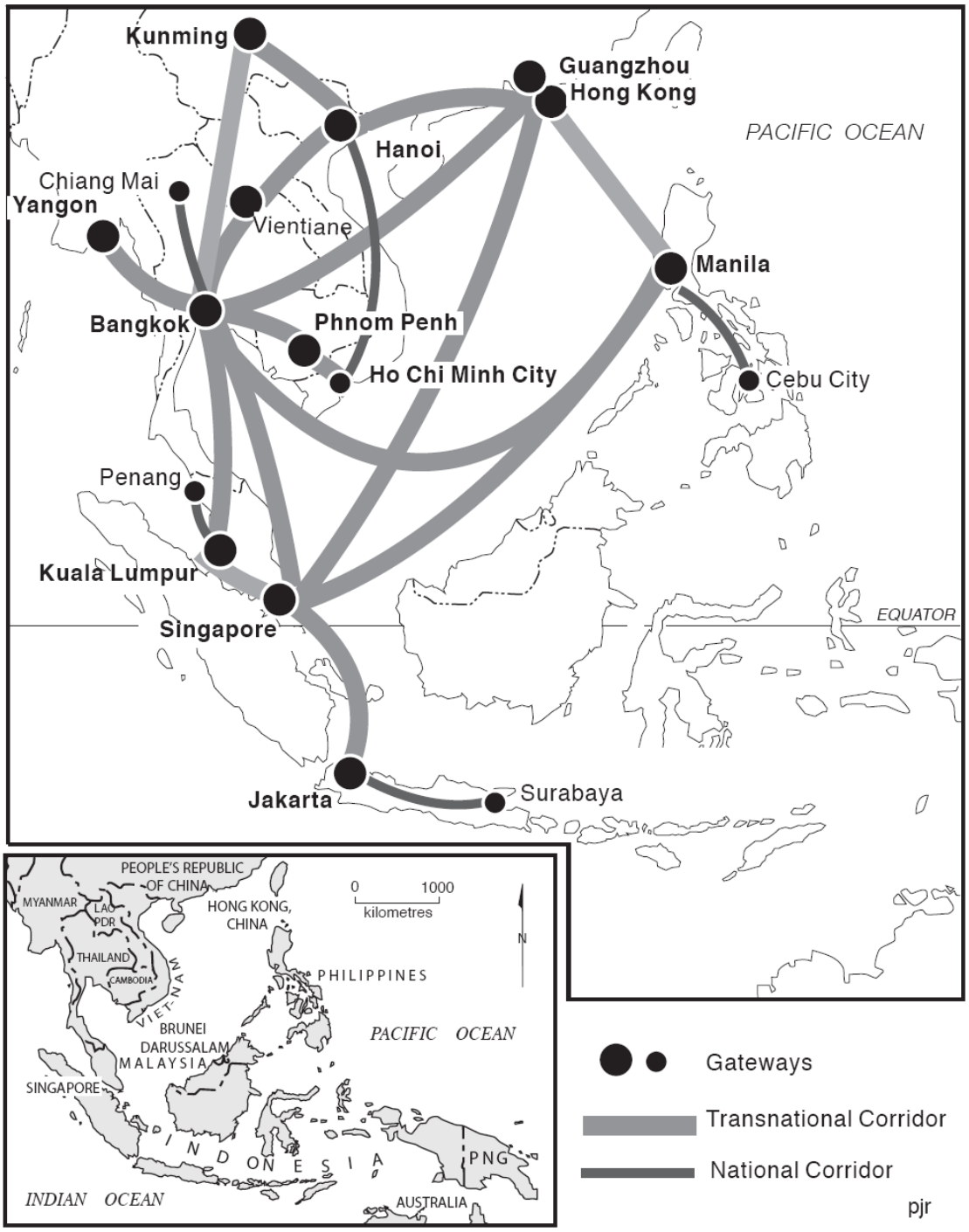
A *multimodal corridor* (or belt) is a linear orientation of international passenger and freight flows that connect gateways to major markets. Multimodal corridor structure differs according to what is moving.

Thus gateways are the *nodes* and multimodal corridors the *edge*s through which *flows* are directed within *transport networks* connecting supply locations and markets in regions with demand. Key gateway and multimodal corridor elements are: the scale and efficiency of port/airport infrastructure and capacity; multimodal corridor capacity within the urban area and from gateway to market; combined gateway-multimodal corridor reliability; system design for reducing life cycle cost by eliminating steps in the handling of goods through the network; and information systems linking gateways and multimodal corridor operators.

With the globalization of markets and the emergence of complex production networks and multi-step supply chains, gateways and multimodal corridors have become important components of integrated logistics systems aimed at creating the highest level of customer satisfaction by managing global value-added activities. Corresponding institutional frameworks, supported by service providers, seek to optimize the efficient flow and storage of freight, and facilitate both people and related information movements within this *logistics corridor.* Both metropolitan congestion and border crossings are impediments to the efficient operation of the logistics corridors.

Often the term *economic corridor* is used where the gateway, multimodal corridor and logistics corridor strategies are integrated into packages of long-term investment measures that seek to redistribute vibrant economic development. The redistribution process is so designed that development is not concentrated in gateway cities but spread along the route to encompass smaller cities and rural areas. Attention here is centred on the initial prerequisite — the availability of the physical infrastructures of transport and telecommunications provided by the gateways and multimodal corridors (i.e. the 'space' of places) — rather than on elaborating either the institutional framework for logistics corridors or the economic corridors that underpin the regional planning framework designed to facilitate competitiveness in international trade.

Figure 2: Gateways and multimodal corridors in Southeast Asia



Across *Mainland Southeast Asia*, comprising Cambodia, Laos, Myanmar, Thailand and Viet Nam, inter-city corridors involve dense flows of air passengers and freight; telecommunications; and financial transfers. In some cases, there is also busy sea traffic by container ships. There is minimal cross-border land traffic to match that between Kuala Lumpur and Singapore, which is only a four-hour journey (Table 1). Road and rail connections between Kuala Lumpur and Bangkok allow busy cross-border traffic, but mainly to and from southern Thailand, which is closer to Peninsular Malaysia than the Thai capital.

Table 1 Door-To-Door Inter-City Transport in Mainland Asia, 2006

Route	Land transport			Sea transport		Remarks
	km	day	cost	day	cost	
			US$		US$	
Singapore/Kuala Lumpur-Bangkok	1,550	3	1,673	6	1,360	10t truck & 20ft container, excluding customs
Bangkok-Yangon	945	3	730	30	1130	10t truck & 20ft container, excluding customs
Bangkok-HCMC	913	2	1,390	2-3	560	10t truck & 20ft container, excluding customs
Guangzhou-Hanoi	1,190	2	3,000	4-6	560	40ft container including customs
HCMC-Hanoi	1,600	3-4	1,200	4-6	750	40ft container domestic cargo
Bangkok-Hanoi (East-West route via Savannakhet and Dongha)	1,555	3-4	4,200	10-15	2,000	40ft container including customs
Bangkok-Hanoi (North-South route via Mekong and Kunming)	2719	6	n.a,	10-15	2000	

Note: In 2006 the cost per ton from Hanoi to Kunming was US$270; the cost per TEU from Haiphong to Kunming was US$1579 (Banomyong, 2007).

Sources: Banomyong, 2007; JETRO, 2007 and JICA, 2007.

Improved cross-border access has not created new economic corridors comparable to Singapore-Kuala Lumpur-Bangkok, but generated some prosperity in what used to be remote up-country zones (Table 1).[5] This is especially true of northern Thailand, Laos and southwest PRC as part of the Greater Mekong Subregion (GMS). For political reasons, Myanmar has only partially shared in these opportunities through the flood of refugees into northern Thailand, thereby creating a plentiful supply of cheap labor. Nevertheless, Chiang Mai as the main urban focus of the region is still a city of less than 0.5 million people and the urban planning area of the Chinese border city of Jinghong, has a population of only 135,000 (UN Habitat/ADB, 2005).[6]

On the Thai-Malaysian border better cross-border infrastructure has helped to maintain some level of prosperity in the troubled southern Thai provinces which would otherwise have

[5] ADB (2005: 18) defines an "economic corridor as a well-defined geographical area centered on a transport corridor integrated with the development of other infrastructure and economic activities through planned and systematic project, policy, and institutional interventions".

6 Jinghong is the capital of Xishuangbanna Dai Autonomous Prefecture, Yunnan province, PRC with a provincial population of 376,000 (including Jinhong).

continued to suffer from their remoteness from their administrative and economic centre of Bangkok. This is not a new phenomenon because Penang has always extended its economic hinterland into southern Thailand, facilitated early in the twentieth century by the completion of cross-border rail connections (Dick and Rimmer, 2003). Nevertheless, the main southern city of Hat Yai, despite its economic potential, still has a population of only 363,000.[7]

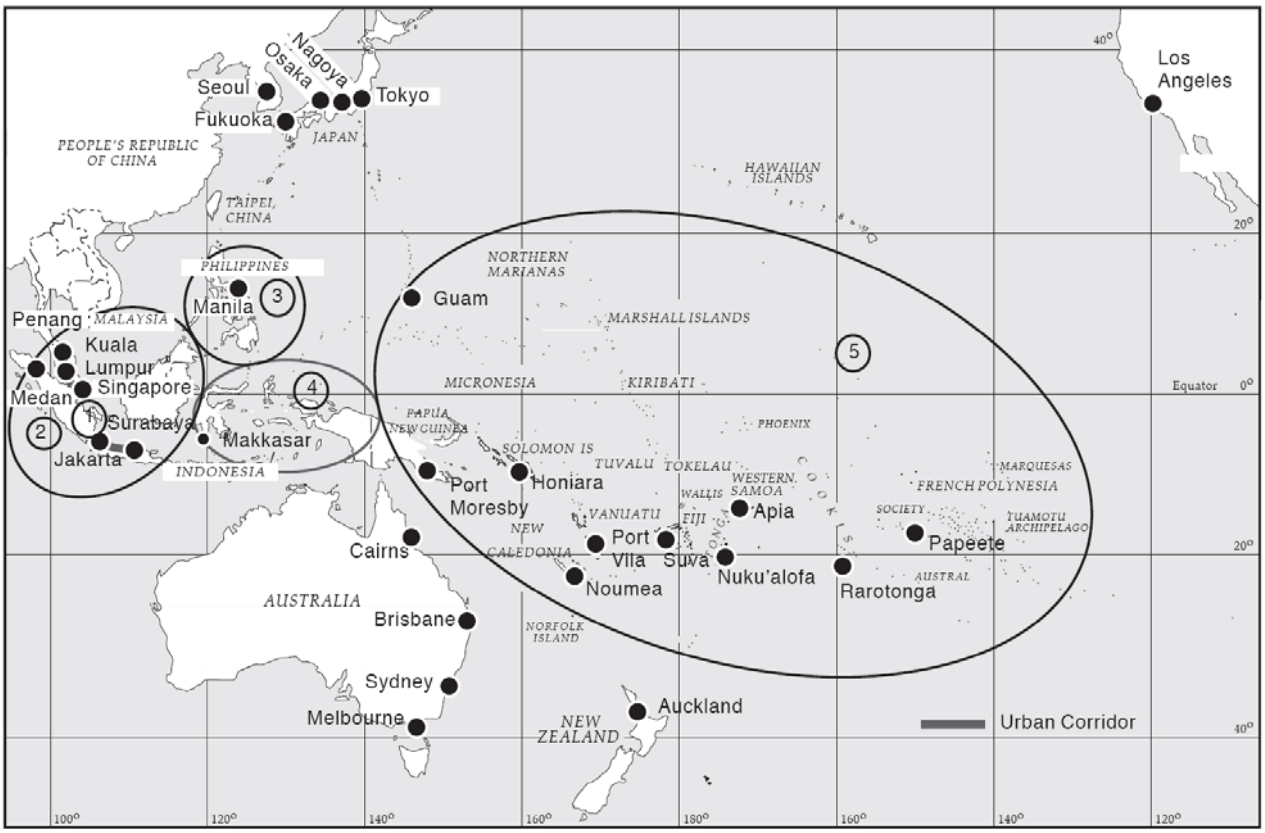
Land traffic between Bangkok and Yangon, Ho Chi Minh City and Hanoi in the Greater Mekong Subregion is sparse at this stage due to the mountainous topography and lack of road development (Table 1). Sea traffic is still by far the cheapest way of moving cargo door-to-door, except for valuable airfreight. In the long run, most benefit will be derived from improved road transport to Yangon because the sea route from the Gulf of Thailand is a long way round. The benefit is less obvious for Ho Chi Minh City because the sea route from Bangkok to this significant and rapidly growing economic hub is more direct, taking two–three days door-to-door by ship compared with two days by road (JETRO, 2007). Ho Chi Minh City has a more vibrant economy than Yangon and the improvement in land transport could help Phnom Penh to develop into more than an economic outpost, particularly with the attractive back haul rates on offer. Sometimes key elements of domestic infrastructure may yield a higher social return (e.g., an upgraded highway between Ho Chi Minh City and Hanoi), though trade-offs with alternative investments may be difficult to discern because of the lack of clarity in national priorities.

Most discussions on the Greater Mekong Subregion focus on the Bangkok-Hanoi land connection. Despite the establishment of logistics operations between Guangzhou in southern PRC and Hanoi, the rival alternative Bangkok-Hanoi routes have yet to attract regular commercialized trucking operations. Following the completion of the Second Mekong International Bridge between Savannakhet and Mukdahan, the East-West route via Dongha, favoured by the Japanese government to connect the country's affiliated companies in Thailand with their counterparts in Viet Nam, has reduced door-to-door transit time between Bangkok and Hanoi by road from four to three days compared with 10–15 days by sea (Table 1). Yet, according to Masami Ishida (2007), the roundabout North-South Route via Kunming, preferred by the Chinese government, seems to have better prospects for road transport between Bangkok and Hanoi/Haiphong due to the route's higher population, density, and gross regional product. Even when one or both of these routes have commercialized trucking services, sea transport will still maintain its advantage in bulk transport.

Island Southeast Asia and the Pacific Islands as a contiguous geographic region may be separated into five distinct zones (Fig. 3). First is the economic core, forming a corridor of dense traffic situated between West Malaysia, Singapore and Java. This corridor contains four main cities (Kuala Lumpur, Singapore, Jakarta and Surabaya) and has a combined population of around 150 million (2005). The western side of Peninsular Malaysia is well articulated, although there are still political issues to be resolved between Malaysia and Singapore in facilitating road and rail traffic across the two bridges. In the absence of a land corridor between Singapore and Java there is dense air and sea traffic. On the island of Java itself, however, land traffic is greatly handicapped by a highly inefficient rail network and a very incomplete Trans-Java Tollway System.

7The Greater Hat Yai-Songkla Metropolitan Area has a registered population of almost 713,000, but an estimated real population over one million).

Figure 3: Spatial structures of Island Southeast Asia and the Pacific



The second zone, encompassing the huge, resource rich island of Sumatra, has enormous potential to link in more closely with the economies of West Malaysia, Singapore, and Java, but awaits the completion of a reliable all-weather trans-Sumatran highway and the resolution of cross-border trade facilitation issues, including flows of illegal labor migrants. Some of that potential has been recognized in the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT) linking northern Sumatra with northern Malaysia and southern Thailand. But in fact the prime international orientation of the rich Sumatra province continues to be towards Singapore. On the similarly resource-rich islands of Kalimantan, all-weather roads are now allowing a modest degree of cross-border traffic between East Malaysia and Indonesian Kalimantan, but here the economic potential is constrained by low population densities and low resource endowments.

The third zone is the Philippines, which divides into three sub-zones. The main island of Luzon, which in economic terms is not much more than Greater Manila, has a strong sea and air traffic orientation to Hong Kong, southern PRC, Taipei,China and Japan, and a lesser connection by the same modes to Singapore. The second zone comprising the Central Philippines archipelago is focused on Cebu City and, to a lesser extent, Iloilo City. The big resource-rich island of Mindanao is the third sub-zone. The problem with the economic development of Mindanao is its distance from Manila and the thirty-five year Muslim insurrection. The Philippines has been more successful than Indonesia in building land bridges between the islands connecting to roll-on roll-off and fast ferries. Nevertheless, domestic economic integration will be held back until there is some settlement of the Muslim rebellion so that Mindanao can be developed to its full potential and a solid economic axis be created between Greater Manila, Cebu, and Mindanao.

Considerable political and agency effort has gone into the development of the Brunei Darussalam Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) region (Cooney, 2007). This region links Brunei, North Sulawesi and East Kalimantan (Indonesia), Sabah (Malaysia), and Mindanao (Philippines). The hope has been that an open cross-border region would help to overcome the locational and developmental disadvantage of these remote parts of all three countries. In practice, the region has lacked any core or any fundamental rationale. The insurrection in Mindanao, ongoing tensions over unofficial labor migration from Indonesia and the Philippines to East Malaysia, plus the age-old smuggling trade in the same direction, hamper efforts at integration. In other words, the liveliest economic potential consists precisely in those activities which governments seek to restrict. It is not apparent that lack of infrastructure is the critical constraint upon the much-needed economic development of this region.

The fourth zone comprising the vast expanse of Eastern Indonesia, the least developed part of Indonesia, presents a more intractable challenge. Except on the large islands of Sulawesi and the West Papua, there is very little scope for land-based communications and no alternative to air and sea transport. Sparse populations and low labor productivity rule out the development of manufacturing centers so that, except for pockets of resource exploitation or tourism, out-migration is the best prospect for economic advancement. Container movements by sea, a key indicator of the pace of economic development, in 2006 totaled only an estimated 230,000 TEUs (twenty-foot equivalent units) for this zone, about the same as the estimated 220,000 TEUs for the Pacific Islands (Table 2). These tiny volumes of traffic may be compared with 8.8 million TEUs for Mainland Southeast Asia and 42 million TEUs for Island Southeast Asia's Zone 1 (1.9 million TEUs for Zone 2, and 3.4 million for Zone 3).

Table 2: Throughput Of Southeast Asia And Pacific Islands Ports Ranked In World Container Port Traffic League, 2006

	Rank	TEUs		Rank	TEUs
		thous			thous
MAINLAND SE ASIA			**ISLAND SE ASIA (cont.)**		
Greater Mekong Sub-region			*Zone 2 Western Indonesia and Malaysia Outside Urban Corridor*		
Laem Chabang	21	4,123	Penang	96	850
Bangkok	67	1,451	Belawan	191	304
Ho Chi Minh	42	2,328	Bintulu	241	192
Haiphong	147	464	Kuching	269	152
Cai Lan	291	113	Muara	n.r.	131
Qui Nhon	347	54	Kuantan	281	125
Da Nang	n.r.	36	Pontianak	334	66
Sihanoukville	226	221	Sibu	346	54
Sub-total		8,790	Rajang	349	53
			Kota Kinabalu	n.a.	n.a.
			Sub-total		1927
ISLAND SE ASIA					
Zone 1 Urban Corridor			*Zone 3 Philippines*		
Singapore	1	24,792	Manila	34	2,722
Jurong	102	816	Davao	205	258
Port Klang	16	6,326	Cagayan de Oro	247	178
Tanjung Pelapas	19	4,770	General Santos	302	97
Pasir Gudang	94	881	Iloilo	316	84
Tanjung Priok	25	3,280	Zamboanga	341	60
Tanjung Perak	n.r.	1,059	Subic Bay	n.r.	35
Sub-total		41,924	Cebu	n.a.	n.a.
			Sub-total		3,434
			Zone 4 Eastern Indonesia		
			Makkasar	n.a.	n.a.
			Bitung	n.a.	n.a.
			Zone 5 Pacific Islands		
			Apra (Guam)	n.r.	82
			Noumea	n.r.	75
			Papeete	335	65
			Pago Pago	n.a.	n.a.
			Port Moresby	n.a.	n.a.
			Suva	n.a.	n.a.
			Sub-total		222

In the fifth zone of the Pacific Islands, the development challenges mirror those of Eastern Indonesia over an even wider area and sparser populations (World Bank, 2006; ADB, 2007a). Papua New Guinea is the only landmass in the South Pacific where land-based transport has potential to integrate urban centres. Port Moresby, its capital, is the largest centre in the Pacific Islands, with a population of almost 300,000 (Table 3). Beyond Papua New Guinea, Greater Suva, the capital of Fiji, has a population of 225,000 and only the main island of Viti Levu has seen any development of manufacturing (mainly textiles), but this has been undermined recently by political turmoil.

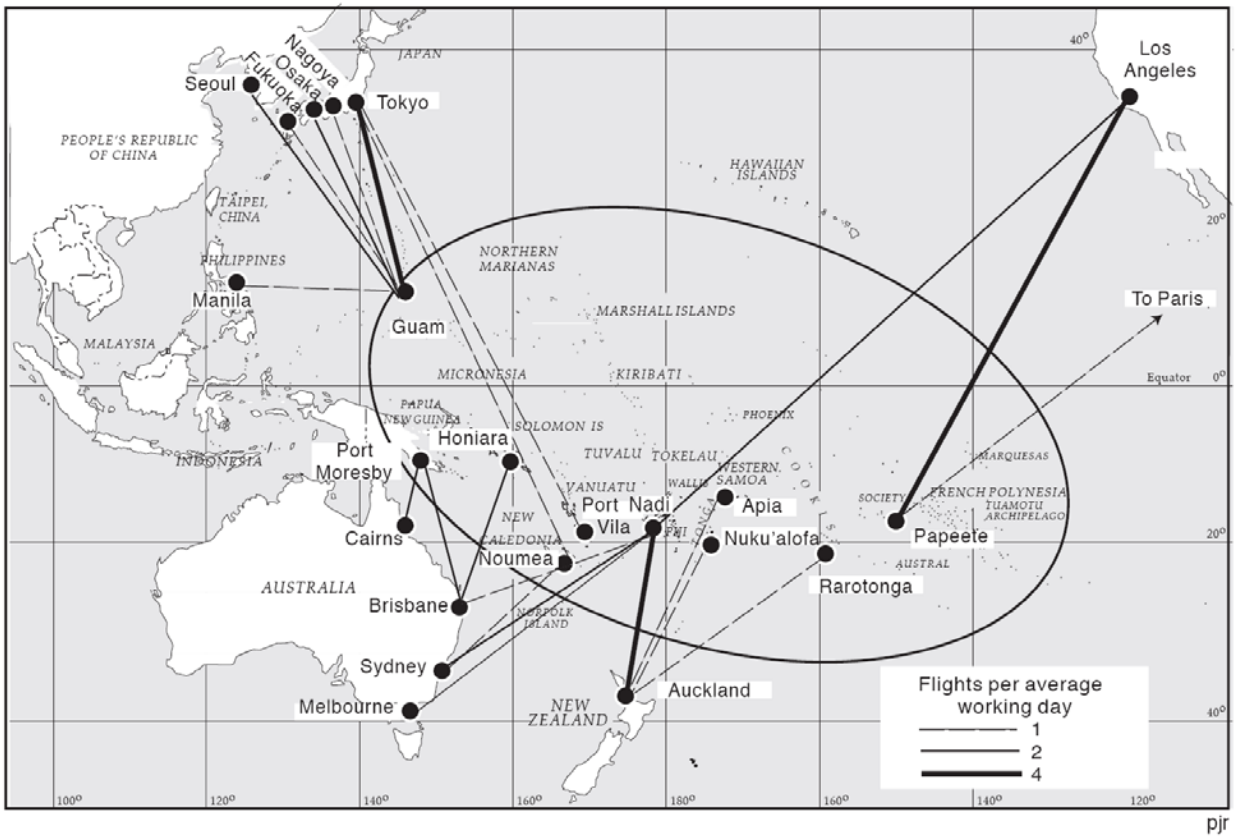
Table 3 Capital City Populations For Pacific Island Countries, 2007

Capital City	Country	Population
		thous
Port Moresby	Papua New Guinea	299
Greater Suva	Fiji	224
Noumea	New Caledonia	156
Hagåtña	Guam	149
Papeete	French Polynesia	131
Honiara	Solomon Islands	66
Apia	Samoa	43
Port Vila	Vanuatu	40
Nuku'alofa	Tonga	25
Palikir	Federated States of Micronesia	7

Source: UNS, 2008

For the rest of the South Pacific, natural resource development and tourism are therefore the limits of economic potential (COA. 2006). Economic improvement for individuals and their families depends heavily on out-migration to and remittances from Australia and New Zealand. Tourism and labor flows sustain a basic network of air traffic. A daily flight connection (i.e., five or more per week) is not only the minimum level of accessibility for business people but also a very good indicator of proximity to or remoteness from the economic cores of the international economy (Fig. 4). Only Apia, Guam, Honiara, Nadi, Noumea, Papeete, Port Moresby, Port Vila, Rarotonga, and Nuku'alofa on this score have daily flights through to Auckland, Brisbane, Cairns, Fukuoka, Los Angeles, Manila, Melbourne, Nagoya, Osaka, Paris, Seoul, Sydney or Tokyo (Table 4). Some direct international shipping services have been mostly replaced by feeders to and from smaller ports 'hubbing' on local trans-shipment centers, notably Auckland for the South Pacific and Guam for Micronesia (ADB, 2007a). The problems of domestic passengers and goods movements, which for the most part involve collection and distribution to and from their tiny capital 'cities', are almost intractable because of the minuscule scale combined with institutional failure. Governments can readily be criticized for poor investment decisions and stifling regulation, but it is unlikely without massive subsidies that private sector investment will be forthcoming on anything like the necessary scale.

Figure 4: Fights per average working day from the Pacific Islands.



The eastwards transition across the five zones from Island Southeast Asia to the Pacific highlights the benefits and the limitations of a development and infrastructure policy conceived in terms of gateways and multimodal corridors. There is a progressive switch from the well-developed multimodal inter-city corridor, stretching from Medan/Penang via Kuala Lumpur, Singapore and Jakarta to Surabaya, through the resource rich areas of Sumatra and Kalimantan, the three key sub-zones in the Philippines, and the vast zone of Eastern Indonesia to the islands of the South Pacific where there are no multimodal corridors at all. These differences are of crucial importance in considering the efficiency and effectiveness of SEZs and their role in regional cooperation and integration (ADB, 2007b).

Table 4: Flights Per Average Working Day, March-April, 2008

	Pacific Islands Airports										
		APW	GUM	HIR	NAN	NOU	PPT	POM	VLI	RAR	TBU
AKL	**Auckland**	1	—	—	4	—	—	—	—	1	1
BNE	**Brisbane**	—	—	2	1	—	—	2	—	—	—
CNS	**Cairns**	—	—	—	—	—	—	2	—	—	—
FUK	**Fukuoka**	—	1	—	—	—	—	—	—	—	—
LAX	**Los Angeles**	—	—	—	2	—	4	—	—	—	—
MNL	**Manila**	—	**1**	—	—	—	—	—	—	—	—
MEL	**Melbourne**	—	—	—	1	—	—	—	—	—	—
NGO	**Nagoya**	—	1	—	—	—	—	—	—	—	—
OSA	**Osaka**	—	2	—	—	—	—	—	—	—	—
PAR	**Paris**	—	—	—	—	—	**1**	—	—	—	—
SEL	**Seoul**	—	2	—	—	—	—	—	—	—	—
SYD	**Sydney**	—	—	—	2	1	—	—	—	—	—
TOK	**Tokyo**	—	**4**	—	—	**1**	—	—	1	—	—

Note: Pacific Islands Airports — APW Apia, GUM Guam, HIR Honiara, NAD Nadi, NOU Noumea, PPT Papeete, POM Port Moresby, VLI Port Vila, RAR Rarotonga, and TBU Nuku'alofa

Source: OAG (2008).

4. SPECIAL ECONOMIC ZONES

Since the establishment of the original export processing zone in Kaohsiung, Taipei,China, in 1965, much hope has been invested in special economic zones (SEZ) (or their equivalents such as the existing free ports of Hong Kong, Singapore, and Penang in Malaysia) as ways of bypassing the constraints of poor infrastructure and weak governance in many Asian-Pacific countries (Kuchiki, 2006; ESCAP, 2007). Although Penang lost its free port status in 1969, free-trade zones were established there in 1971 following a Malaysian trade mission to Taipei,China and subsequently dispersed throughout the country. In particular, these Malaysian export enclaves, like those in Taipei,China, were used not only to compensate for infrastructure deficiencies but also to adopt flexible policies targeting multinational companies in the electronics industry (Table 5). Since the 1980s, SEZs, typified by Shenzhen in PRC, have proliferated in Asia as catalysts for economic reform and alleviating poverty. While fostered by local or provincial governments, they have been subject to central government intervention to attract multinational anchor firms. Now these SEZ-style policies are being promoted as an instrument to strengthen the impact of cross-border transport and communications infrastructure, particularly in the Greater Mekong Subregion, together with the construction of domestic transport infrastructure and agricultural development.

Table 5: Export Processing Zones In Asia, 2006

Country	EPZs	Other types	Total employ-ment	Fem	Invest	Firms	Zone exports	Total exports
	No.	No.	Thous	%	US$mn	No.	US$mn	%
China	15(EPZ)	COC SEZ [56(ETDZ) 12(FTZ) 53(HIDZ) 49TIZ) 14(BECZ) 10(THR)}	40,000	—	17.0bn	43,360	145.1bn	59
Hong Kong	—	IE CP SP	336	—	29.6bn	3,845	101.5bn	—
Japan	—	2(OSFTZ)	200	—	965	77	—	43
Macao	—	IP	131	—	5.5bn	3,100	2.7bn	80
Mongolia	—	1(TZ) 12(EDZ)	—	—	—	—	—	—
Taipei, China	5(EPZ_	IIPC	68	—	24,629	354	343	—
South Korea	—	3FEZ	39	70	11.6bn	—	30.6bn	—
Cambodia	3(EPZ)	—	200	—	—	—	—	—
Indonesia	—	Bonded zone	6,000		11.3bn	1,149	18.4bn	—
Malaysia	13(FIZ)	200	491	54	5.5bn	3,000	12.6bn	83
Philippines	4(public) 41(private)	31	1,128	74	1.3bn	1,179	32.0bn	60
Thailand	10(EPZ)	22(GIZ)	452	—	1.4bn	1,367	8,242	
Singapore	7(EPZ)	35(IP)	—	—	6,400	7,000	166	—
Viet Nam	10(EPZ)	8(IZs) 173(other)	950	45	1,067	234	—	80-100
Bangladesh	8(EPZ)	5341	188	85	1.035	252	11,717	76
India	—	8(SEZ)	101	32	8.0bn	811	4.9bn	—
Maldives	—	EEZ	88	—	—	—	—	48
Nepal	1(EPZ)	—	—	—	—	—	—	—
Pakistan	22(EPZ)	4(IZ)	888	—	3,872	300	8,073	—
Sri Lanka	12(FTZ)	4(IP)	411	—	287	223	4,283	38
Russian Federation	—	Nakhodka FEZ	388	—	17,089	—	413	—

Notes: BECZ Border and Economic Cooperation Zone; COC Chamber of Commerce; CP Cyber Port; EEZ Exclusive Economic Zone; EPZ Export Processing Zone; ETDZ Economic and Technology Development Zone; FEZ Free Economic Zone; FIZ Free Industrial Zone; FTZ Free Trade Zone; HIDZ Hi-Tech Industrial Development Zone; IE Industrial Estate; IIPC International Information Products Companies; IP Industrial Park; IZ Industrial Zone; OSFTZ Okinawa Special Free Trade Zone; SEZ Special Economic Zone; SP Science Park; THR Tourist and Holiday Resort; TIZ Taipei,China Investment Zone; TZ Trade Zone.

Source: Boyenge, 2007

Some SEZs in Asia have achieved rapid employment growth, especially for women, increased exports, and boosted skills and technology transfer.[8] However, SEZs are not a panacea for all problems as there have been failures manifest in low net exports, poor linkages, unclear cost/benefit structures, administrative barriers and social issues (including providing a cover for corrupt and illegal business practices).[9] Akinci (2006) has attributed these failures to public sector development, uncompetitive policies, lack of integrated development procedures and controls, and inadequate institutional infrastructure (see also World Bank Group, 2008). The importance of location as an independent variable was not considered in evaluating the mixed track record of SEZs.

The most profitable locations for SEZs in Asia have been found in the immediate hinterlands of global gateways (Fig. 5).[10] Proximity to gateways has been a key factor in the efficiency and effectiveness of SEZs in the Pearl River Delta; the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT) linking Singapore with the Indonesian provinces of West Sumatra and Riau and the Malaysian state of Johor; the Lower Yangtze 'economic zone'; and the emerging Seoul-Incheon-Gaesung triangle. Usually, gateway cities are also the most valuable component of the national market; the largest market for skilled labour; have the most frequent national and international transport connections; have the most accessible information and the cheapest search costs (Rimmer and Dick, 2009). All these factors generate externalities leading to increasing returns to scale.

New special economic mega-zones (SEMZ) are emerging to overcome the traditional enclave-like character of SEZs and accommodate the trend towards global production networks.[11] Their emergence as logistics hubs makes proximity to global gateways an even more fundamental locational criterion. Featuring integrated mixed land use activities, these satellite mega-zones combine airport, seaport, new town, tourism, utilities, industrial park and commerce under a single authority (Rimmer, 2004a). Employing either public-private partnerships or private developer approaches, the mega-zones, typified by Incheon FEZ (Rimmer 2004b) and Dubai Logistics City (DLC), are set within a revamped regulatory framework offering investors supply chain competitiveness and superior locational advantages, plus government compliance with World Trade Organization (WTO) rules and International Labour Organization (ILO) commitments.[12]

The archetypal SEZ, on which the special economic mega-zone is based, is not Kaohsiung's pure economic platform but Shenzhen, which owed its initial location to proximity to the global gateway of Hong Kong, China. The subsequent success of Shenzhen, with a current

8 Reportedly, the SEZs have worked well in Taipei,China, South Korea, China and Viet Nam, where governments wanted a high degree of control over how their economies opened, but have been less successful in Indonesia, the Philippines and Thailand, where the addition of a few square kilometers of plants and roads have not reversed the overall effect of the economy (Adams, 2007).

9 Woodbridge (2008) reports that SEZs play a role in the trans-shipment and transit of counterfeit goods, prompting the International Trade Association (ITA) to urge government intervention to halt this traffic.

10 Akinci (2006) defines an SEZ as an integrated development, over 100 km2 in area, having no typical location, with multi-use eligible activities, and serving domestic, internal and export markets.

11 According to Akinci (2006), this trend is associated with the increasing importance of supply chain management, outsourcing, the rise of value-added services, the switch from supply driven to consumer relationships; development of integrated clusters, and the co-location of sales and manufacturers to attract integrated manufacturing clusters. Also, Akinci sees the special economic mega-zone reflecting the policy trends towards global integration through the World Trade Organization (WTO), deepening of regional trade blocs, harmonization of taxes and investment rules, liberalization of telecommunications and IT sectors, and enhanced trade and supply chain security.

12 The WTO requires SEZs to phase out their export-subsidy component by 2010 in conformity with the provisions of its Agreement on Subsidies and Countervailing Measures Agreement adopted during the Uruguay round between 1986 and 1994 (Woodbridge, 2008). Only the poorest WTO members (i.e. under US$1000 per capita) will be able to offer duty-free import an export rights in a SEZ. Making these adjustments will primarily apply to manufacturing-based SEZs rather than those with strong commercial or logistics elements.

population of around 9 million (including floating residents), allowed the SEZ to open up its own container port terminals (Yantian, Chiwan, and Shekou) and Shenzhen Bao'an International Airport. Although Shenzhen is fourth in the world league of container ports, the second ranking Hong Kong, China continues to serve as the main global gateway. Moreover, Hong Kong, China with Guangzhou fulfils this role in relation to other zones in the Pearl River Delta. Shenzhen was not chosen in isolation but selected to maximize its locational advantages. In drawing lessons from Shenzhen and its PRC counterparts for India, Chee Kian Leong (2007) attributes the resultant increased economic growth not to the sheer number of SEZs, but to the greater scale of liberalization.

In Southeast Asia, unlike PRC, most countries have only one international gateway. There is really no choice as to where SEZs are located due to inefficient inland freight distribution in the Asian-Pacific Region. Unlike the West Coast of North America, where an efficient inland distribution system permits the dispersion of equivalent activities to new and larger cities, the quality of economic space in Asia decays rapidly as one moves beyond the metropolitan region. As reflected in Thailand, 80% of the country's 50 industrial estates/parks/zones are within 150 minutes of Bangkok (BOI, 2008); similarly in Viet Nam there is a proliferation of SEZs in and around Ho Chi Minh City (Runckel, 2008). However, the real issue is not *where* to locate a SEZ but how to make the mega-cities more efficient in themselves. This is the challenge of both infrastructure and governance. In terms of optimal investment, the highest yielding returns are in relieving the constraints of urban infrastructure. Otherwise, improved national and international infrastructure links are simply delivering more traffic faster into a worsening bottleneck. The real SEZs are the cities themselves and that is where the focus should be.

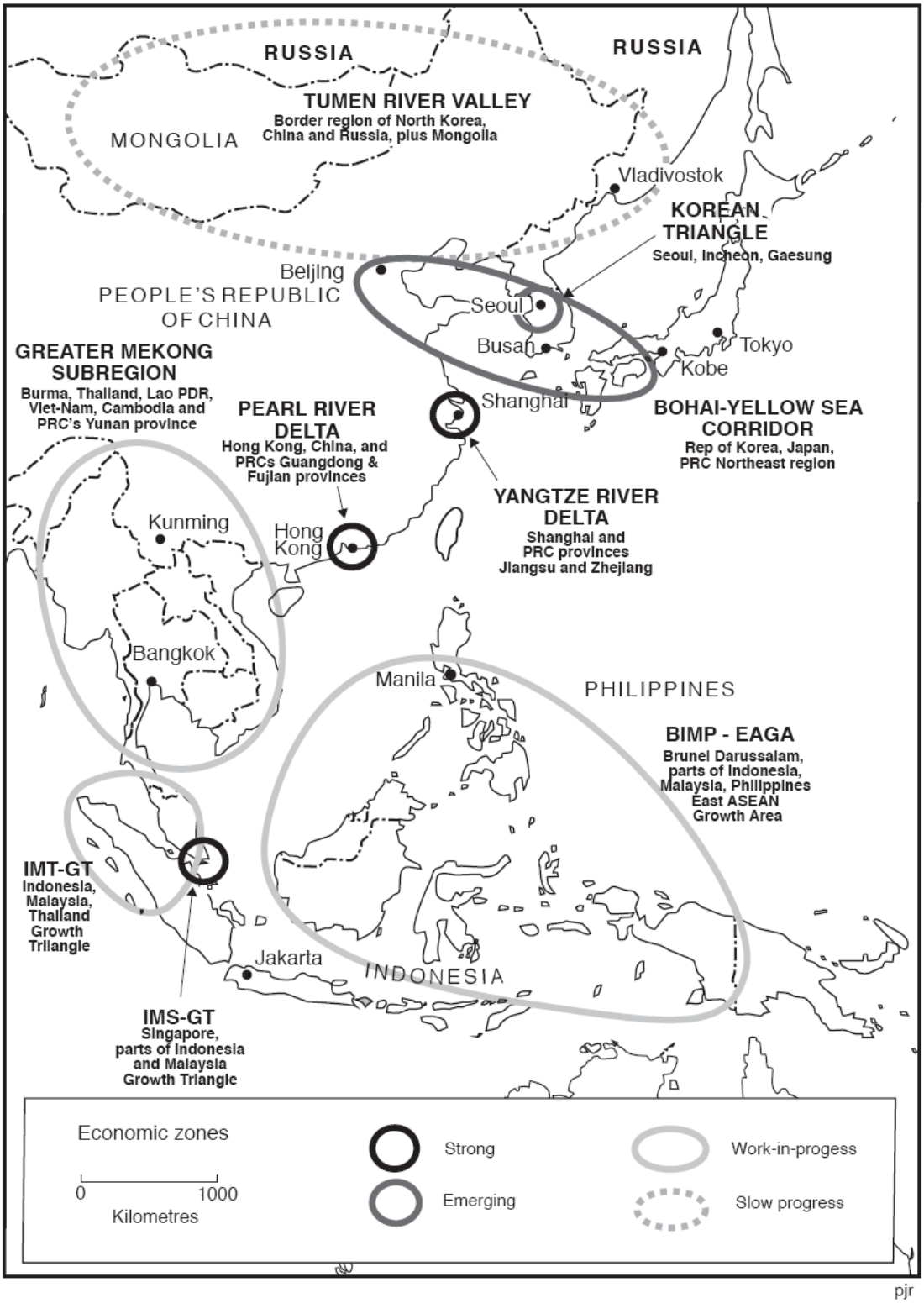
In contrast, some non-gateway locations (inland industrial clusters) identified in Figure 6 are being earmarked for SEZs and some inland logistics parks developed as components of regional development strategies to bolster the impact of transport infrastructure development in the border areas of Cambodia, Laos, Myanmar, Thailand, and Viet Nam (Table 6).[13] The reduction of institutional barriers through the GMS Cross-Border Transport Agreement (CBTA) are projected "to induce the growth of local traffic along border crossing routes as well as demand shifts from air and maritime transport" (JICA, 2007: 8).[14] Nevertheless, some non-gateway locations are likely to impose higher overall unit costs for non-agricultural and non-resource developments, place some SEZ firms at a competitive disadvantage, and provide serious obstacles to dreams of efficient decentralized locations.

The apparent need for cross-border infrastructure may in large part be a product of the artificial 'distortions' created by national policy regimes. Genuine economic integration has occurred in the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT) where 'Greater' Singapore forms an urban hub, constituting a cross-border connection in a central location. While Batam and Bintan Islands in Indonesia provide both labour for manufacturing firms and land for golf, there is nevertheless, at the same time, a thriving business attracting cross-border patrons for gambling, prostitution and cheaper liquor.

13 The SEZs in Cambodia are designed to develop islands of good governance as a shortcut towards attracting foreign investment where reforms to legal systems and the construction of infrastructure nationwide are tardy (Adams, 2007).

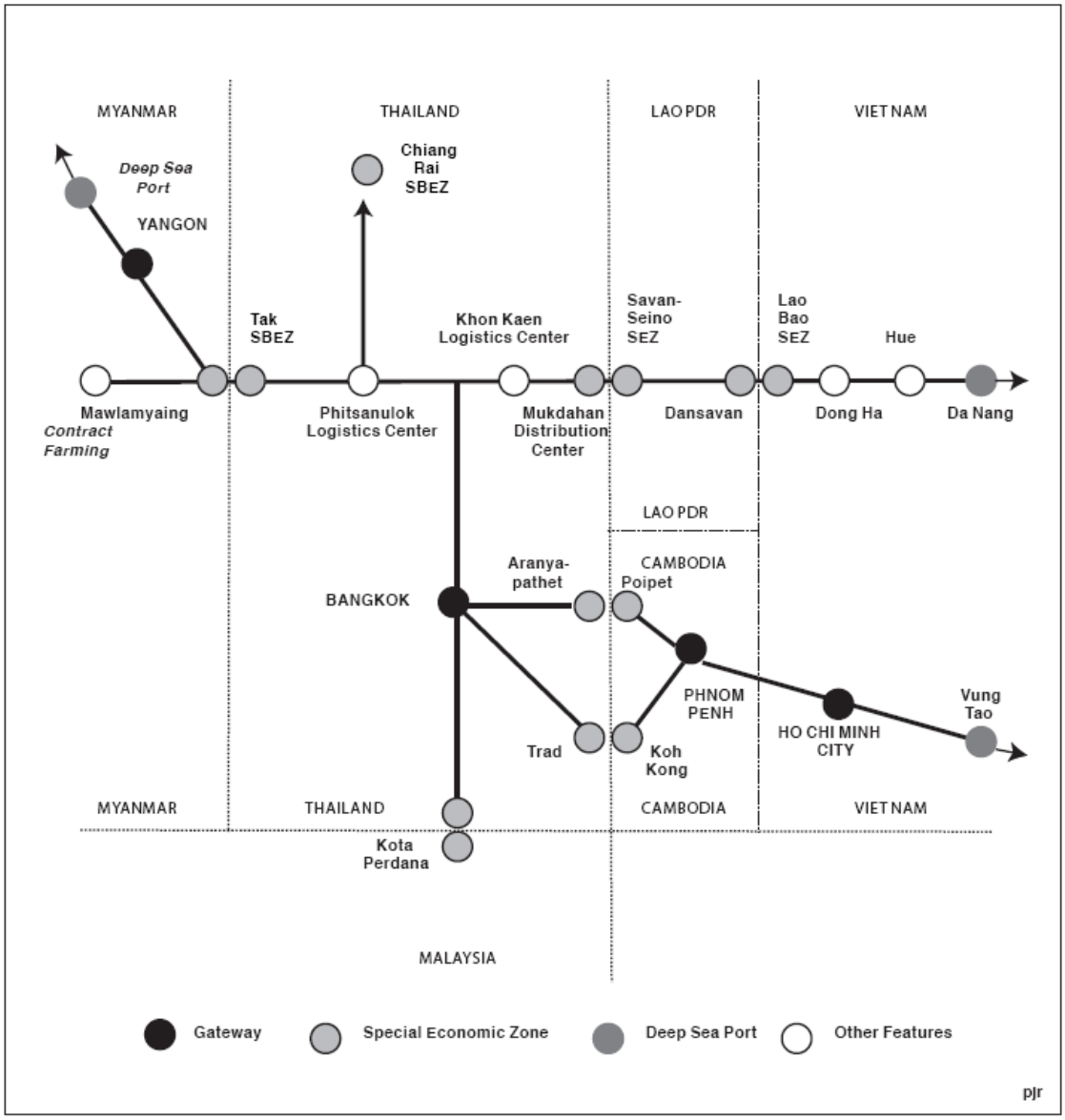
14 The 2003 CMTA is a multilateral instrument designed to facilitate the cross-border movements of people and goods within the GMS. Specifically, it provides on designated routes for: "(i) single stop inspection; (ii) cross-border movement of persons (including visas for those engaged in transport operations; (iii) transit traffic regimes, including exemptions from physical customs inspection; (iv) bond deposit, escort, and agriculture and veterinary inspection; (v) requirements that road vehicles will have … to be eligible for cross-border traffic; (vi) exchange of commercial traffic rights; and (vii) infrastructure, including road and bridge design standards, road signs and signals (Kuroda, 2006: 13).

Figure 5: Location of subregions in East Asia



Source: Based on Rimmer, 2004a

Figure 6: Location of existing and proposed Special Economic Zones in the cross-border areas of the Greater Mekong Sub-region



Source: Based on Vilmolsiri, 2007

Table 6: Major Regional Developments Proposed For Border Areas In Mainland Southeast Asia

Country	SEZ	Adjacent country	Notes
Cambodia	Manhattan (Bavet)	Viet Nam	Cheap labour force available in Cambodia Some infrastructure installed from Thailand and Viet Nam
	Chhay Chhay (Poipet)	Thailand	
	Koh Kong	Thailand	
	Sihanoukville	n.a.	
Lao PDR	Savan-Seno	Thailand	Coordinate with Mukdahan-Savannakhet SEZ
Myanmar	Myawadi-Mae Sot Regional Development	Thailand	Many people from Myanmar working in Mae Sot, Thailand
Thailand	Chiang Rai	Border area	Coordinate with Yunnan Province (China), Lao PDR and Myanmar
	Mukdahan-Savannakhet	Laos	Coordinate with Savan-Seno
	Trat-Koh Kong	Cambodia	Coordinate with Koh Kong
	Myanmar	Myanmar	Coordinate with Myawadi-Mae Sot
Viet Nam	Lao Bao	n.a.	First SEZ in Viet Nam
	Moc Bai	Cambodia	Coordinate with Manhattan

Note: n.a. not applicable.

Source: JICA, 2007; Takeuchi, 2007; Vimolsiri, 2007.

A range of identical or similar activities, according to Andrew Walker (1999), underpin the apparent economic potential of cross-border, twin-town SEZs and may, in large part, be a function of cumbersome and distorting policy regimes (e.g., counterfeiting, gemstones, illegal migration, logging and 'smuggling'). For example, in the case of SEZs on the Myanmar-Thailand 'border', the likely outcomes are that refugee Burmese labour ends up on the Thai side and firms on the Myanmar side engage in activities that are illegal in Thailand. If the aim of cross-border SEZs is to by-pass irksome regulations this is a good way of undermining national policy. However, Harry G. Johnson (1965) argued forcefully that distortions should be tackled at source. Over time liberalization and harmonization of ASEAN policy regimes should gradually whittle away distortions. In well-functioning economies industrial clustering occurs within proximity of hubs. Second- or third-best policy cross-border SEZs are a way of accommodating distortions not addressing them.

In the Pacific Islands, the equivalent of the SEZs are the tourist resorts. There are no agglomerations of cheap labour and, because of the low volumes of cargo, there are no competitive sea and air freight rates compared with what is offered to business in PRC and Southeast Asia. Thus, SEZs cannot be expected to play a key role in the Pacific Islands.

Nevertheless, the preoccupation with SEZs has arguably distracted attention from the gross inefficiencies of the large cities with which they are linked or in which they are embedded. In many Asian cities the poor quality of infrastructure is the main obstacle to the movement of people and goods around the city and in and out of the metropolitan region, whether to the rest of the nation or to the wider region. And it is not just a matter of transport and communications. The interlocked problems of water supply, drainage and sewerage constitute a potentially catastrophic failure of public investment that may cause many coastal cities to become dysfunctional as global warming magnifies existing crises. Jakarta and Surabaya, Bangkok and Yangon are some of the most obvious examples. How to make national gateways more efficient is therefore an urban, a national, and a regional challenge.

An interesting policy question is why some cities have established themselves as better gateway locations than others. Singapore; Hong Kong, China; and Shanghai, for example, have had much more success in developing critical infrastructure than Jakarta, Manila, or Ho Chi Minh City. The obvious answer is that Singapore and Hong Kong, China are rich, while Shanghai has mobilised massive funds for modernisation of its infrastructure. Other cities, by contrast, appear short of money and reliant upon capital flows, which are not necessarily attracted into social infrastructure. This lack of money is true only in a narrow sense. In all these countries the tax base is concentrated in the capital cities. In relative terms the problem is not the availability of funds but their distribution and allocation, as testified by booms in real estate and shopping malls. The challenge is one of mobilising funds from the local tax base for investment in large-scale projects. Although it is a somewhat trite observation: governance matters. Shanghai has risen to the challenge, as did Tokyo and Seoul at a time when Japan and the Republic of Korea were not yet prosperous countries. Other cities are hampered by weak urban governance and lack of concern—even indifference—from national governments. Endemic and worsening congestion, pollution, power failures, and flooding are the consequence.

There is a well-grounded concern that the reallocation of scarce investment funds to very expensive urban infrastructure will further starve rural and up-country districts of much-needed investment. This is the old argument of ‘urban bias’. In this context it is an unhelpful perspective because it suggests a false trade-off. A proper calculus of national investment priorities would suggest that more funds need to be spent on both urban and rural infrastructure. The modest amounts needed for most individual rural projects can potentially be funded from higher domestic taxation. The many billions of dollars required for urban infrastructure is a much greater challenge. While higher taxation of the urban rich and middle class offers part of the solution—those who will be the greatest beneficiaries of these investments can reasonably be expected to pay for them—large urban infrastructure projects also justify borrowing against the income stream of future generations, who will also be the beneficiaries. Here there are technical financial problems to be resolved, especially with regard to private investment. So far more success has been had in attracting private equity into power stations and water supply than into public transport, drainage, and sewerage projects.

5. CONCLUSIONS

The greatest and glaring inefficiency in the Asian-Pacific region is in the urban agglomerations that are the main locus of economic activity. Considerable care needs to taken to ensure that the new enthusiasm for land based infrastructure in cross-border regions is not at the expense of high-yielding investments in vital urban infrastructure (Roberts and Kanaley, 2006). In determining trade-offs there is a need to consider a door-to-door logistics approach to all transport modes and seek to undertake the best calculus and ranking. There is a need to go beyond transport modes because cities are networks. Drainage networks have to be considered as they affect flooding and sewerage networks

concern health. As the efficiency of the city depends on more than transport links, it is important not to be too sectoral in approaching this task.

These observations are most true of mega-cities like Bangkok, Jakarta, and Manila but less so of small cities, sometimes little more than overgrown towns like Port Moresby, Suva and Nuku'alofa, the capitals of Papua New Guinea, Fiji, and Tonga, respectively National governments are often reluctant to undertake large infrastructure projects in transport, sewerage and drainage within cities, but catastrophic flooding will overwhelm smaller scale projects designed to resolve urban poverty issues (e.g., slum improvement schemes). While up-country and border regions need investment, by and large, the scale of project is modest (village and rural roads, telecommunications towers, small airports), which do not necessarily need international aid funds. Indeed, in those countries that are democracies there is a political process to deliver local infrastructure and it is perhaps the quality of governance that needs to be addressed rather than lack of local capital *per se*. Up-country areas should not have to wait for international agencies to solve their problems.

There are also trade-offs between international and domestic projects. Within the Greater Mekong Subregion, the coastal highway between Ho Chi Minh and Hanoi would inter-mesh with transnational corridors. Similarly, the coastal tollway in Java and its extension into the Trans-Sumatra highway would benefit from some aid component of funding, even though not contributing directly to cross-border movements.

As noted, the 'national' calculus for setting infrastructure priorities has obvious limitations, especially for small countries but also for the border regions and gateways of large countries. Conventional cost benefit calculus can underestimate the importance of cross-border movements in 'glueing' multiple actors on different sides of the divide together and 'lubricating' economic cooperation (Chen, 2006; Edmonds and Fujimura, 2008). Conversely, the 'transnational' calculus can also skew investment to cross-border movements at the expense of domestic needs. There is also a high risk that elevating the priority of infrastructure investment located adjacent to physical borders may accommodate temporary distortions in national policy regimes that will be more effectively addressed by intra-regional liberalization and harmonization. *In the European Union where resources are allocated fairly efficiently between countries, one does not observe large economic agglomerations at national borders.* Thus a cross-border focus may be too narrow.

The vision explored here is designed to strengthen Asia's competitive position in global commerce by creating reliable, efficient and secure connections between main urban gateways to permit both seamless and fast movement. This regional policy framework for strategic gateways and multimodal corridors will guide future actions (Bohunicky, 2007). Strategically located gateways and border crossings play a vital role in fostering international competitiveness. Support is needed for gateway strategies and multimodal corridors to enhance trade competitiveness and the development of a regional transport network. A system-based approach is required that tackles infrastructure, policy, governance and operational issues in an integrated public and private sector strategy. As evident from the contrasting studies of Mainland Southeast Asia, Island Southeast Asia and the Pacific Islands, there is no 'one-size-fits-all' package.

What is needed is a policy that distinguishes main flows of goods, people and information from the actual contours and gradients of economic space and pays attention to door-to-door logistics movements. Where are the highest returns from investment in network infrastructure such as transport, telecommunications and sewerage? The best returns are likely to be derived from large infrastructure projects in the main cities (e.g. to combat flooding in Bangkok, Manila and Jakarta) and specific intra-city transport links (e.g. Trans-Viet Nam and Trans-Java highways and railways). Given that there is no such thing as homogeneous economic space, attention should be should directed to the composition of flows through gateways and along corridors and identification of where the main obstacles, sometimes physical, and sometimes administrative, are to be found. It may be better to

address the very real problems of congestion and pollution in urban areas to overcome externalities and bottlenecks than to spend a lot of money in improving or opening up lower density inter-city corridors to revitalize agriculture, small business and small cities and towns. In turn, SEZs are not a panacea but should be more closely aligned with the infrastructure development of the host cities to minimize the inefficiencies (e.g. congestion) as they impede the movement of people and goods. More specifically, there is the issue of how to determine priorities between modes in infrastructure development.

Investment planned in 2008 looks to the post-Kyoto world beyond 2012. In the 10-15 years hence it has to be assumed that increasing scarcities of fossil fuels will result in higher fuel prices across Asia. This will shift the relative prices of transport modes. For example, small unit truckloads will become more expensive relative to consolidated shiploads. In other words, pending the design of more fuel-efficient engines, road transport will become more expensive relative to sea transport. Rail transport will also be favoured at the expense of road transport, suggesting that Viet Nam, and Java and Sumatra in Indonesia, less so the Philippines, could support more efficient rail networks. While it is difficult to substitute the role of pick-up and delivery trucks within urban areas, the costs of road traffic and congestion will rise markedly increasing the need for rail-based public transport (e.g. in Jakarta and Ho Chi Minh City). Although these observations hint at the direction of change occurring in modal split, this issue needs further in-depth investigation to help international lending agencies determine priorities.

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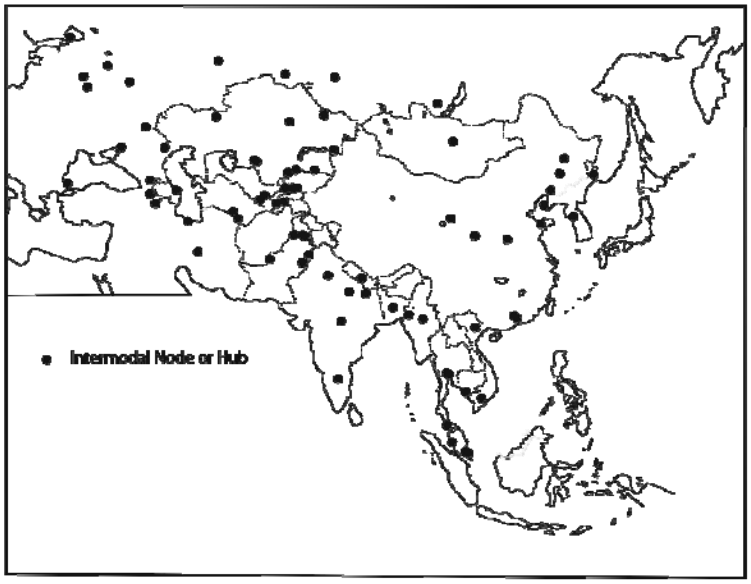
ANNEX: EXPLORING TRANS-ASIA NETWORKS

An analysis is made of nodes or gateways, networks and hierarchies to indicate how Asia and the Pacific can be interconnected. At this stage the analysis is exploratory but should lead to a discussion of how nodes are identified, interconnected and weighted.

A useful starting point is the long-term vision for an international integrated intermodal transport system for Asia and the Pacific provided by the United Nations Economic Commission for Asia and the Pacific (ESCAP) (Ha, 2008). Designed to enhance the capacities for international trade by extending development opportunities to inland areas and landlocked countries, ESCAP's vision of intermodal integration hinges on developing the Asian Highway and the Trans Asian Railway to extend the reach of seaports and the maritime network inland.

A key element of the ESCAP plan involves the establishment of inland intermodal nodes at the intersection of highway and railway networks. These nodes can serve as dry ports at inland locations and are seen as providing the basis for establishing growth centres to attract manufacturing, agricultural processing and associated services. The nodes are examined here as a yardstick against which an alternative pattern of nodes can be compared before proceeding to examine networks and hierarchies

Figure A1: ESCAP's intermodal modes



Source: Rimmer, forthcoming

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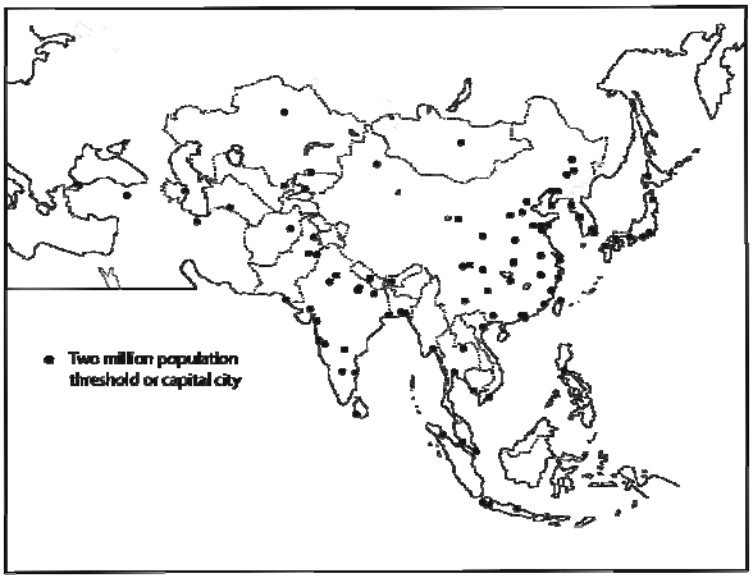
Figure A2: Nodes in Asian Development Bank area of interest with populations over 2 million and any national capitals below that threshold (UNS, 2008)



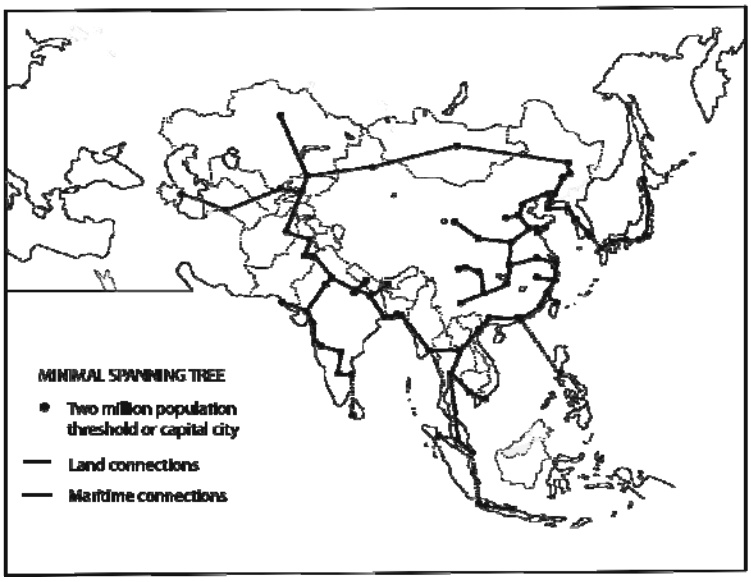
Source: Rimmer, forthcoming

Nodes or Gateways: ESCAP identifies 65 intermodal hubs; 50 within the Asian Development Bank's are of interest and 15 in adjacent areas (Figure A3). Forty per cent of those within the ADB's area are in Central Asia (Koide, 2007). Only 22 per cent of the hubs are in Northeast Asia (Table A3).

Table A1: Comparison of the location of ESCAP'S intermodal nodes and threshold nodes based on population and national capital status

	ESCAP		Threshold nodes	
	Number	Per cent	Number	Per cent
Central Asia	20	40	5	6
South Asia	10	20	20	22
Southeast Asia	9	18	12	13
Northeast Asia	11	22	53	59
	50	100	90	100

Figure A3: Minimal Spanning Tree Network linking nearest neighbor nodes

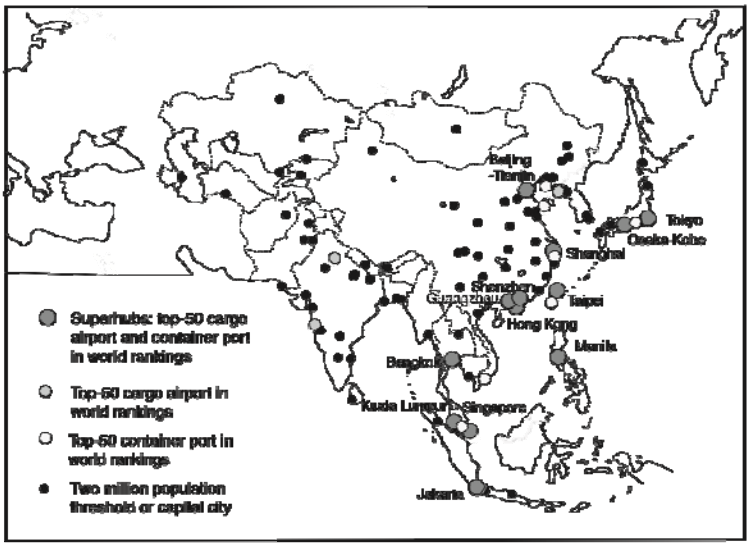


Source: Rimmer, forthcoming

Network: A very different network to ESCAP's intermodal patterns appears if we connect nearest neighbour nodes with populations over 2 million together with national capitals below this threshold; only Tashkent in Central Asia has a population above this threshold. Two arcs appear in the resultant minimal spanning tree connecting: (1) Northeast Asia through Southeast Asia and South Asia to Central Asia; and (2) Northeast Asia and Central Asia (Figure A3).

Hierarchy: All nodes in the ESCAP vision have an equal weighting; no mention is made of airports. If weighting is applied based on the presence of the threshold cities in either the top-50 container ports or the top-50 cargo airports in 2005 a different pattern emerges (CI. 2007; ACW, 2006). Twenty-five nodes are identified. Thirteen are 'superhubs' as they appear in both the port and airports lists; and seven appear only as ports and three only as airports (Figure A4). None of these gateways are located in Central Asia.

Figure A4: The hierarchy of nodes



(*Source*: Rimmer, forthcoming)

These explorations indicate that visions of integrated infrastructure development centred on nodes or gateways and covering all modes depend on thresholds, the rationale for connections and weightings. Ideally, these criteria should be augmented by data on flows of goods, people and information, and lead ultimately to the mapping of the nature of economic space.