Twin cities and urban pairs, a new level in urban hierarchies structuring transnational corridors? A Case Study of the Pekanbaru-Dumai Urban Pair

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Specialists in transport geography define a corridor as an area of particular intensity in terms of flow and of spatial, economic, and demographic accumulation, generally supported by transportation infrastructures, on an axis between two poles (Debris and Comtois 2010; Rodrigue, Comtois, Slack, 2006). According to this definition, Asia is structured by transnational continental and maritime corridors which are hierarchized according to the intensity of their traffic and trade patterns, be they local, regional, or international. These corridors, whether planned or the result of existing flows, are structured by nodes whose ranks are linked to the ranks of the corridors and whose dynamics are closely tied to international exchanges along its length. These nodes function as logistic and communications hubs or gateways into territories and participate in articulating the space of flows (Castells 1996) and the space of places (Albrechts and Coppens 2003). The head nodes of the corridors are usually large first or second rank metropolises. Between these poles of command, the corridors are structured by a hierarchical series of hubs: by inland province capital cities and by smaller border towns along the continental corridors or, in maritime corridors, by smaller ports.

In the area studied, the strongest corridors, which are commanded by some of the most powerful global cities[i], are the maritime corridors (Malacca Straits and the corridor that runs along the Asia's Pacific coast). Asia also possesses continental corridors, especially the planned corridors of the Greater Mekong Subregion (GMS), a dense grid of transport corridors that connects southern China to Southeast Asia and the eastern and western coasts of the Indochinese peninsula (see Christian Taillard's article in this volume).

The dominant spatial organization is north-south both at the transnational level as it does in continental Southeast Asia at the national level in terms of spatial constructs. The dominant corridors, whether continental or maritime, are north-south oriented (or north-west-south-east in the case of the Malacca Straits) due to the intensity of the maritime traffic in one of globalization's dominant poles or, for continental corridors, due to the intensity of flows with China. The transverse corridors, which feed the main meridian ones, are emerging secondary corridors even though they are sometimes based on traditional spatial organizations, as in the GMS where some portions of the corridors redraw ancient caravan linkages or in Sumatra where transversal rivers were the main transport modes.

The maritime corridors are structured by cities located at the entrance and along the corridors, the competition between ports as much as the intensity of flows allowing the development of several commanding cities. The corridor that runs along the coastline of Asia Pacific is commanded by several global cities. Singapore, Hong Kong, and Tokyo, which have structured the corridor since the 19th century, share their nodal functions with Seoul and Pusan across the Sea of Japan, Taipei and Kaoshiung across the Taiwan straits[ii]. In the Malacca Straits, Singapore, located at the Straits' East Asian entrance, controls the Straits.

Kuala Lumpur claims a portion of the command functions over port and air flows in the Straits, placing it in a competitive relationship with Singapore. The other extremity of the Straits is controlled by Penang and Medan, two cities in the midst of a fully engaged process of metropolization[iii].

The cities that command the continental corridors are less numerous and of lower rank in world urban hierarchies than in maritime corridors and are only situated at the extremities of the corridors. Kunming to the north and Rangoon, Bangkok, and Ho Chi Minh City to the south are the head nodes of the north-south corridors of mainland Southeast Asia. Except in the case of the planned "Capital cities transverse corridor" of Ho Chi Minh City-Bangkok-Rangoon, the poles of command of the transverse corridors are mostly second rank regional cities.

Transnational corridors are key vectors to channel flows. The combined regional, national and transnational dynamics are responsible for the more rapid development of existing cities or promote the emergence of new types of cities along these corridors, through the addition of activities or management functions of flows. The development of second-tier cities initiates this process of densification of the urban framework. At the lower end of the urban hierarchies, it is also responsible for the development of smaller cities. The New Economic Geography concludes by stressing a direct link between agglomeration forces and growth (Fujita 1999 or for a summary, Fujita 2008). However, in direct contrast with this concept, Hardoy (1986) and Moriconi (2010) postulate that the dynamics of small cities might also occur far from large metropolises thanks to new opportunities offered by transnational dynamics.

Studying the transformation of the lowest-ranked cities (in urban hierarchies) is another approach to analyzing the impact of transnational dynamics. However, accounting for their transformations requires studying them not as individual entities, which in many cases would ignore much of the process; but rather as functionally complementary or competing doublets situated across borders or within the same national territory. Multiple parameters need to be examined: their location (central or peripheral) within national space, their place in national urban hierarchies, their relationship with former command centers, and for border cities, the type of borders involved (land, river, or sea). This paper will try to attempt a typology of these new nodes linked to the regionalizing process of globalization.

To explore how urban duos are formed through combined regional, national, and transnational dynamics, this paper aims at studying the emergence of the paired cities of Pekanbaru-Dumai, which are located in the province of Riau, in the center of Sumatra Island, a location where there is a marked discontinuity in the island's urban hierarchy. Resulting from the combined action of Indonesian national planning and transnational dynamics, the dynamics of these cities, which work together due to functional complementarity despite possible competition, are linked to their position at the crossroads of a dominant north-south axis and a reactivated transverse axis that articulates both national and transnational processes. These pair cities represent a new urban scale in maritime Southeast Asia, consisting of two main hierarchized poles undergoing rapid transformations and operating as a network thanks to improved infrastructures supporting the creation of corridors.

1. Urban pairs and twin cities, towards a typology of new urban configurations on corridors

It is necessary to introduce a distinction in terminology between twin and pair cities. The distance between cities, and, where appropriate, from the border, is a key differentiator. In this paper, the term “twin city” indicates border cities, located along land or river borders, whose geographic proximity is a key factor in their integrated operations. The term “urban pairs" or "pair cities” will encompass cities located at greater distances than “twin cities”; but which are often linked by hierarchical, complementary, and sometimes competitive relationships. These “pairs” either exchange particularly important flows between each other or are poised to do so due to their position within corridors. This concerns the relationship between both regional capitals and border or port towns within the same national context as well as between cities facing each other across the Straits of Malacca (ie. **Map 11.1**).

Twin cities in border areas: an integrated functioning?

The border town and its tandem functions with its urban counterpart on the other side of the border is an evident first form of these new types of hubs. This holds true whether this functioning is planned within the context of national planning strategies or transnational cooperation strategies, or whether it is the result of spontaneous economic or cultural ties resulting from historic legacies or mere geographic proximity. Eventually, these twin cities will likely form new, trans-boundary, urban configurations as a result of important investments in transport infrastructure: bridges, roads, urban bypasses, as well as the intervention of private actors responsible for internationalizing local economies. The diversity of situations is obvious. In addition to how cities are situated within their respective national territories and their respective national urban hierarchy as previously stated, we must also consider their distance from their respective borders and the inclusion or exclusion of border areas in transnational cooperation programs such as the GMS corridors or growth triangles.

The type of border regions is a first step to refining the typology of border doublets. When the border separates peripheral regions, the twin cities are small border towns, in relation to their national scale, with comparable sizes and economic weight. They tend to occupy lower ranks in their respective national urban hierarchies, as shown by the urban twins that are strung along China's southern border: such as Ruili-Muse between Yunnan and Burma, Hekou-Lao Cai between Guangxi and Vietnam (studied in this work), or on the upper Mekong like Mae Sai-Tachilek between Thailand and Burma, and Chiang Khong-Huay Xai between Thailand and Laos. In Peninsular Malaysia, twin border cities are linked with the Indonesia-Malaysia-Thailand growth triangle (IMT-GT)[iv] as well as with the border between Thailand and Malaysia, including that of Danok (Sadao) / Bukit Kayu Hitam, also studied in this work. These twin cities on the Thai-Malaysia border present the same patterns as those observed in continental Southeast Asia. Most of these twin border cities could be considered as integrated border peripheries, a useful concept to describe these towns that weigh little in their respective urban national hierarchies, but which benefit greatly from transnational dynamics despite their remoteness from more important cities.

When the border separates highly asymmetrical territories – a peripheral region at the national level on one side compared to a central zone at the national level on the other side as is the case along part of the Mekong border between the northeast of Thailand and Laos, the cities involved are no longer very small towns, but medium-sized cities, such as Savannakhet facing Mukdahan, a twin studied in this work, or more openly asymmetrical twins such as Vientiane, a national capital, and Nongkai, a provincial capital. Note also that Thailand's national economic dominance over Laos is often inverted when it comes to their asymmetrical twin cities: the Laotian component is largely dominant in the twin pairings of Vientiane-Nongkai and Savannakhet-Mukdahan.

In all cases, twin cities whose borders are defined by a river are not as closely linked, for water offers greater opportunities for exchanges between hubs that are not necessarily located opposite each other. Bridges, important crossing facilities that maintain terrestrial continuity and concentrate flows, are the necessary condition for a more integrated functioning of cities on either side of border rivers. Political commitment to facilitating trade is also needed.

These twin border cities are often the result of planning at the national level and within the framework of transnational cooperation programs. They benefit from bilateral agreements that accompany the implementation of the Greater Mekong Subregion (GMS) corridors or growth triangles. The cities in this context often benefit from public investment in transport infrastructure, industrial and mixed-use free trade zones, and the facilitation of border crossings. The difficulty then is to encourage the private sector to take over public investment in the economic sector with long term returns. The private sector accompanies and even anticipates the boom effect linked to the construction of these new infrastructures, but it tends to focus on those services that are most directly profitable.

National and Transnational Urban Pairs

Another case is represented by urban pairs located on both sides of the Malacca Straits. The Straits, regardless of the sections considered, feature high differential levels of development between both sides that generate asymmetries. The Malaysian shores compose the center of peninsular Malaysia whereas their Indonesian counterpart is located at a distant periphery from the nation's core. Given the importance of the Malacca Straits in global circulation, its shores are punctuated by large cities, some are even ranked as global cities. However, due to their asymmetrical development, there are more cities, with higher rankings, on the Malaysian side than on the Indonesian shore. A series of various sized ports relay these cities and constitute the specificity of the hubs of this maritime corridor. Indeed, the maritime patterns of the Malacca Straits corridor requires careful consideration of its ports and their hierarchy, as suggested by Nathalie Fau in her presentation of Straits whose width and international status render the corridor's architecture even more complex.

Even more than river borders, maritime fluidity limits the reality of paired operations of ports on both shores in favor of polycentric functioning of the ports in the Malacca Straits, despite the crushing weight of Singapore. Within the context of IMT-GT corridors, the Asian Development Bank (ADB) projects of corridors across the Malacca Straits do map out possible pair cities such as Medan and Penang, or Dumai and Melaka. However, relationships are in fact multidirectional and changing, depending on the volume and nature of the flows as well as on the final destination of the transported goods.

Transnational dynamics are also responsible for the development of pair cities at the national level, strongly hierarchical structures that add territorial depth to the impact of border dynamics, as territories are integrated into a world system. Maritime Southeast Asian ports and their pairs, either dry ports or inland cities, are the very urban border figures that are most affected by transnational dynamics. The case of Ipoh, studied in this book, shows how this city, located mid-way between Penang and Kuala-Lumpur, has regained strength thanks to its dry port function after a period of crisis due to the decline of its previous base economic sectors: mining and industry. Today, it is Southeast Asia's main dry port, thanks to its complementarity with costal ports. The functional complementarities between coastal ports controlled by towns further inland also allow the development of paired operations. This type of functioning is even more closely tied when the port was created to serve the city, as in the case of Kuala Lumpur and Port Klang. The Malaysian capital developed during the 19th century as a mining town and not a port town.

In mainland Southeast Asia, such pairs can be found between border cities and regional capitals located further inland, on the same transnational corridor and benefiting from the resumption of economic relations since the 1990s between Yunnan and mainland Southeast Asia. This is the case for Chiang Rai, which plays an important role in the functional management of border towns such as Mae Sai and Chiang Kong. In Burma, Kengtung controls the border town of Tachilek. The current dynamic of Mandalay is strongly associated in Burma with the activities of the Ruili-Muse twins and with the resumption of economic relations with the Yunnan along north-south communication axes.

These processes have reinforced key provincial capitals, whose functions have diversified beyond simple administrative functions, particularly in the GMS where infrastructure investments are very important as are incentives provided by national governments to attract businesses to these peripheral areas (Lainé 2011). Chiang Rai's Special Economic Zone (SEZ), Mukdahan's industrial park, and especially Khon Kaen's dry port infrastructures (regrouping containers) should over time promote the industrial dimension of these provincial capitals located within the GMS corridors.

National urban pairs, and especially urban pairs connecting regional cities and ports which are specific of maritime configurations, have been identified as one of the urban categories that are emerging from the ongoing globalization process and the transnational dynamics it generates. The Pekanbaru-Dumai case allow us to elaborate on this specific configuration.

2. The change of scale and rhythm of Pekanbaru's development

The foundations of Pekanbaru's recent economic take-off

Pekanbaru, founded in the 18th century according to official historiography, is situated a hundred kilometers from the mouth of the Siak River and numbered 900,000 inhabitants in 2010. It is the capital of the Riau province[v] of Sumatra. This sparsely populated province, located along the Straits of Malacca, grew rapidly in the 1950s with the discovery of oil fields and the development of plantation crops (see Muriel Charras in this volume). Riau's economic structure was modified with the discovery and the exploitation of oil fields (Duri, Minas), roughly sixty kilometers north of Pekanbaru, by the American company, Caltex (California Texas Oil Company), whose current operator, Chevron, is also one of its subsidiaries. Caltex built the deep water export port of Dumai in an inlet sheltered by the island of Rupat, across from the Malaysian city of Melaka. This port is connected to the oil fields by 150 kilometers of pipelines and a small road, which in 1958 was extended from Duri to Pekanbaru, home to Caltex' headquarters and where a portion of its staff resides.

The Pekanbaru-Dumai road opened up hectares of forest to industrial use and thus allowed other activities to develop: forestry, plantation crops, and near Pekanbaru, business activities tied to the presence of storage companies and to the arrival of many migrants (Colombijn, 2002). The arrival of these workers, whether spontaneous or through Indonesian transmigration programs (especially starting in the late 1970s), triggered conflicts over land control and between ethnic groups. In the 1970s, Pekanbaru was the capital of a "frontier" province (Colombijn, 2002), leading a rapidly developing territory with growing population rates that had undergone profound economic and social upheavals over the previous half-century. The province's population has multiplied by five since 1971, mainly through immigration, and the city of Pekanbaru has multiplied by six.

In 2010, Dumai already had a population of 253,000 inhabitants, despite its short history as an oil port built in the 1950s[vi]. Dumai's port activity met the needs of the oil industry but not the harbour requirements of Pekanbaru, whose river port remained active for quite some time. Up until the 1990s, Dumai oriented its activity towards exports and therefore towards the Straits of Malacca. It had few ties with other cities on Sumatra's east coast (Fau, 2003), despite the existence of Pekanbaru-Dumai road.

Despite all this, the necessary conditions currently exist for these two cities to function as a pair by playing on functional complementarities. One of the conditions was the improvement of road infrastructures that places Dumai and Pekanbaru on the dominant, eastern, longitudinal axis dominating Sumatra's road system. It also necessitated the reactivation of a transversal axis from Padang to Pekanbaru, allowing Pekanbaru to recover its pre-colonial era functions as a link between the western highlands, the coast, and the Straits of Malacca.

Pekanbaru : from a node on a transversal river axis to a pole on Sumatra's north-south corridor

Nathalie Fau (Fau, 2006) has analyzed the changes in the spatial organization of the island of Sumatra since the colonial period; starting with a west to east pattern and ending with today's north-south organization. Rivers were the traditional means of transportation and thus highland products from the West were carried to river ports located a hundred kilometers from its mouth, to then be ferried out towards the Straits of Malacca[vii]. Freek Colombijn (2005) accurately traces land then river transportation of goods and the spatial organization of the eastern part of central Sumatra, with its hierarchy of merchandise collection centers, located at the contact points between the river and its major tributaries. This dentritic system allowed a single river port, located at the contact point between peneplain and marshy plain - a point where most tributaries flowed into the main watercourse but where the delta distributaries have not yet taken shape - to control the traffic of its river basin (see also Manguin 2000). This is the case of Pekanbaru on the Siak River, closely linked to the Minangkabau highlands and the Straits of Malacca.

The direction of flows, corresponding to the transversal orientation of the rivers linking the Barisan highlands to the Straits of Malacca, was changed during the colonial era. The development of coffee plantations in the Minangkabau highlands starting in the 1800s was accompanied by the Dutch construction of roads leading from the highland production areas to the west coast. This was accomplished in order to favour the port of Padang, which became the third largest port of the East Indies in the mid-19th century after Jakarta and Surabaya, and diverted part of the traffic heading towards the Straits of Malacca (Colombijn 2005, p.22). Pekanbaru continued to ensure contact with the Straits of Malacca. In 1878, the city was connected by a regular steamboat route to Singapore, where it exported timber cut along the river banks, but Pekanbaru no longer received supplies from its traditional hinterland because a large part of the highland flows escaped its control.

The construction of the first trans-Sumatra route by the Dutch contributed to marginalizing Pekanbaru even further (Fau, 2003). Favouring the Padang and Medan poles, the latter developed during the last third of the 19th century at the heart of a rich belt of plantations on volcanic soils, the Dutch sought to link these two poles directly to Java and therefore built a trans-Sumatran road from Medan to the southern end of Sumatra. This road cut across the highlands and turned its back on a large part of Eastern Sumatra, bypassing the East Coast river ports, including Pekanbaru.

It was not until the 1950s, with the development of oil production and the construction of the

Pekanbaru-Duri-Dumai road by the Caltex oil company, that activity resumed in the eastern part of central Sumatra. Pekanbaru, thanks to the Duri-Pekanbaru portion of the road and its extension to the port of Dumai, would begin to feature on a new eastern north-south axis and thus recover a portion of the activity of a new hinterland, no longer located in the highlands of Barisan, but along the eastern coast. This process really took off with the construction of the trans-Sumatran eastern route in the 1990s.

For Pekanbaru, its position on the north-south axis is all the more important in that the post-independence period, because of increasing centralization of the country's governance, did not change the dominance of a north-south orientation of flows initiated during the colonial era. The north-south orientation of the trans-Sumatran route, which allows Sumatran flows to pour into Jakarta and perpetuates the breaking off of transversal relationships, corresponds to the centralizing efforts of the independent government. This is especially so in that until the late 1980s, Jakarta's centralization led to the closing of the country's borders, the breakdown of direct links between the Sumatran and Malaysian shores of the Straits in favour of transit through Jakarta. This process transformed Sumatra into an Indonesian peripheral zone (see Charras, in this volume), even though it lies along international Straits through which large flows of international trade have always transited.

Pekanbaru: new policies that encourage renewed activities on the eastern seaboard and in relation with the Straits

The shift of economic policies in Indonesia has liberalized several areas of national economy and opened the country up even further to foreign capital as part of a policy of promoting non-oil and gas exports, initiated in the late 1980s. It has also triggered the loosening of Jakarta's stranglehold on international flows. Both the establishment of growth triangles in the 1990s, whose successive expansion ultimately included all the island of Sumatra, and the establishment of AFTA (ASEAN Free trade area) in 2002, have offered various opportunities throughout the country to deal directly with foreign countries. Riau was thus free to do business with the other side of the Straits. However, it is mainly the loosening of centralization due to the fall of the New Order regime in 1998 along with the decentralization process that began in the 2000s, and the economic opening, that has allowed the resumption of direct ties between Riau and the Straits' other shore (M. Charras in this volume).

Decentralization has endowed Pekanbaru, like other departments, with new decision-making powers - despite the ongoing importance of central decision-making, which remains responsible for issuing permits for major investment projects - and new financial capabilities while the province's expansion provided new revenue. Riau is one of the richest provinces in Indonesia, in terms of gross provincial product. Since decentralization measures were enacted, its wealth also comes from its share of oil revenues. The increase in provincial and departmental revenues has helped fund urban planning projects to improve the city, visible in the construction of new, iconic office buildings, especially in the newly created district capitals[viii], as well as attracting domestic and foreign investors. This is even truer in that the administration of Riau province, whose governor actively supports business and foreign investments, strongly encourages cross-Straits exchanges.

Since the separation in 2002 of Riau with the island portion of its territory in favor of the creation of the new province of Kepri (Kepulauan Riau, Riau Islands)[ix], where Singaporean investments in the industrial sector are concentrated, the province of Riau, thus redefined yet maintaining Pekanbaru as its capital, currently directs international flows almost exclusively to Malaysia as it has lost most of its business ties with Singapore. This reorientation has forced Riau to refocus its activities on developing mineral and land resources, especially by

attracting major Malaysian investments to its plantations. It has also confirmed Pekanbaru's role as the main administrative and business pole of Central Sumatra. Riau thus stands as a province whose development is closely linked to transnational dynamics, taking advantage of cultural ties based on its *Melayu* identity to strengthen its relations with the Malaysian shores of the Straits[x].

3. Pekanbaru, a regional capital for Central Sumatra opening onto the Straits of Malacca

Pekanbaru: at the crossroads of north-south and east-west axes structuring Central Sumatra

Confirming the New Order's nation-building focus on north-south organization, three north-south trans-Sumatran road projects were developed in the west, the centre, and the east of the island. The construction of the eastern trans-Sumatran began in the 1990s, starting in the north with Aceh and heading south to Bandar Lampung. It travels through the major cities on the eastern seaboard (Medan, Pekanbaru, Jambi, and Palembang) and relies on pre-existing sections including notably the Pekanbaru-Duri-Dumai road[xi] to which were added sections such as those from Pekanbaru towards Rantau Prapat to the north and towards Rengat to the south[xii].

The eastern trans-Sumatran route was built in sections of uneven quality with insufficient investments to maintain the whole (M. Charras in this volume). The Pekanbaru-Dumai section is so poorly built that it takes up to six hours to travel the 150 kilometers. This seriously hampers relations between the two cities and limits investment. The reasons behind this include the lack of State interest; for quite some time, the Sumatran road was not an administrative priority.

The ambitious new strategy outlined in the 2011-2025 *Master Plan for the Acceleration and Expansion of Indonesian Economic Development* (MP3EI) holds the promise of new possibilities of mobilizing necessary capital, with its focus on developing national economic corridors with clearly identified economic specializations that will concentrate public and private investments. Launched by Indonesia's President in 2010, this strategy aims to enable Indonesia to join the most advanced countries by 2025 (Republic of Indonesia, Coordinating Ministry for Economic Affairs, 2011). The Master Plan complements the regional and national planning documents (RTRWN, RTRW), and falls within the broad guidelines for Indonesia's mid-term (2010-2014) and long term (2005-2025) planning (RPJMN and RPJPN). These corridors will be composed of growth poles formed by the development of industrial clusters and special economic zones, which are linked to existing poles by connective infrastructures that will focus investments (ie. **Map 11.2**).

In Sumatra, as with road projects in the 1990s, the strategy aims primarily for national integration, without of course ignoring the need to plan for international gateways in the context of Indonesia's increasing integration into global networks. Thus, the flagship project will build a bridge linking Java to Sumatra across the Sunda Straits and develop the steel industry in South Sumatra, to complement Cilegon’s facilities in western Java. The program also recognizes the strategic aspects of better integrating eastern Sumatra and recommends developing north-south road and rail links in this region (p. 73). At the level of the Riau province master plan (Riau RTRW 2007-2026), the Pekanbaru-Dumai section already represents a strategic national road that could become a toll road.

Finally, the MP3EI program situates Pekanbaru at the intersection of north-south and east-west axes, recognizing the need to renew relations between Padang and Minangkabau highlands (Bukitinggi region) with Pekanbaru and the Straits of Malacca, especially through investments in communication infrastructures (ie. **Map 11.2 and 11.3**).

Seen from Padang, this means recognizing the need to redirect the west Sumatran flow towards the Straits of Malacca. Since the 2000s, relations have begun to develop with Malaysia and Singapore. Apart from a handful of Malaysian investments in the industrial area of Padang (Fau 2003), Malaysians and Singaporeans are increasingly interested in the region of Padang, the highlands around Bukitinggi, and also the western islands of Nias and Mentawai as tourist destinations, due to accessibility by air from Padang or by road from Pekanbaru. Direct flights by low-cost carriers (daily Air Tiger flights between Padang-Singapore and Air Asia flights between Kuala Lumpur and Padang) have further increased West Sumatra's reputation as a tourist destination. Available flights have also increased medical tourism from Padang to Kuala Lumpur. Padang exports cement, shipping it across the Malacca Straits. A recent survey of West Sumatran small and medium enterprises shows that exports to Malaysia and the IMT-GT have increased, notably handicrafts, embroidery, and traditional textiles, products from the sea and coal (Syahrial Syarif, 2004). The Padang-Pekanbaru section of the route, along with the Medan-Pekanbaru portion, is already considered Sumatra's densest route for passenger traffic (Lubis, Sjafruddin, Isnaeni, Dharmowijoyo, 2005, p.50), while freight traffic intensifies[xiii], road transport being the most widely used mode of transport for goods.

Goods flow either directly to countries on the other side of the Strait, or pass through Riau, whose relations with Padang are important because of the complementarity of the two provinces. West Sumatra has again become a supplier of agricultural products from the highlands, especially market gardening (vegetables, fruits) and fresh fish for the East Coast. It has also become the most sought-after and popular tourist destination in central Sumatra, especially for the middle class and Pekanbaru's expatriates. In addition, plantation farming is moving inward in Riau, towards west Sumatra due to the scarcity of land along the north-south route (Lermoyer, 2011). Today, Padang province's growing interest in reorienting its flows towards Pekanbaru and the Malacca Straits (Fau, 2003) and its reintegration in the Straits' transnational dynamic is visible in the initiatives undertaken by West Sumatra Province. This is especially true in relation to improving the transport network between Padang and Pekanbaru, as existing roads are already congested due to the resumption of flows.

Since 2000, the province of West Sumatra has already invested in the reconfiguration of roads and the construction of bridges to span the bends in mountain roads. It now plans to double the road from Padang to Payakumbuh to improve transport infrastructures for tourism and consolidate links with the eastern seaboard, as many products headed for Malaysia are transported along the Pekanbaru road. The province also plans to financially support the State project of resurrecting the Padang-Payakumbuh-Pekanbaru railway.

As for Riau, the 2007-2026 master plan (RTRW Propinsi Riau) provides, in addition to the construction of the Padang-Pekanbaru railway, for the construction of a highway from Pekanbaru to Bukittinggi.

Pekanbaru and the new grid of transnational corridors crossing the Straits.

The route of the Sumatran corridor of the MP3EI project cuts across the path of two transnational corridors seeking to promote transnational integration at the level of the Straits

and of Asia as a whole. The eastern trans-Sumatran route is one of Indonesia's sections of the Asian highway network, a proposed network of 141,000 km of standardized roads throughout 32 Asian countries. The project is the result of a 2003 inter-governmental agreement, whose implementation is supported by the United Nations through its Economic and Social Commission for Asia and the Pacific (ESCAP). Its north-south path has been incorporated into the economic corridors of the IMT-GT[xiv], which are the focus of investments for infrastructures and supporting facilities financed within this framework. On the main north-south corridor linking Aceh to Palembang, three transverse corridors branch out, connecting Sumatra to Malaysia at two different points: from Aceh to Phuket, from Medan to Penang with an axis extending along the Malay Peninsula to Songkhla and from Dumai to Melaka (ie. Map 11.1).

By drawing three corridors across the Malacca Straits, the Asian Development Bank, responsible for the very concept of economic integration through corridors and author of the IMT-GT corridor routes, has transposed into a marine context the model of continental corridors, especially from the Greater Mekong Region (see Taillard in this volume). It has also planned for ports to function in pairs, thanks to improved connective infrastructures: bridges, fast ferries, or Ro-Ro ships. Though the vision is reductive in terms of the actual origins and destinations of maritime flows across the Straits (see Fau in this volume), the proposal for the paired ports of Dumai-Melaka reflects the reality of the local exchanges of men and goods that has resumed between these two ports.

However, the ADB corridor does not have a transversal extension to Padang, even though all the provinces of Sumatra, including Padang, are part of the IMT-GT. This contrasts with the proposed extension of the Medan-Penang corridor across the Straits, through the Malaysian Peninsula to Songhkla on the eastern coast of southern Thailand. The first corridor routes are based on pre-existing infrastructures and links that focus on the projects; other corridors may be added later. The absence of a lateral route in Sumatra is, however, a sign that integration is conceived first as a trans-boundary issue rather than a transnational one with deeper territorial impact. It also illustrates the mediocrity of transversal relations in Sumatra in the 2000s as compared with north-south flows.

4. The functional complementarity of Pekanbaru-Dumai, a new urban scale?

In the master plan for the province of Riau (RTRW 2007-2026), Pekanbaru and Dumai appear as its two national centers (*Pusat Kegiatan Nasional*). Dumai exercises industrial functions and possesses an international hub port, whereas Pekanbaru exercises tertiary and administrative functions as the regional emergent metropolis of Central Sumatra. The socio-economic development of the province of Riau, overlooking the Straits of Malacca, physically close to the other shore, and closely linked to transnational dynamics; the mobilization of infrastructure investments along the north-south axis; and the reactivation of the transverse axis adding territorial depth to transnational dynamics, all combine to contribute to their functioning as pair cities.

The functional complementarity between the two cities, located 150 km apart, is most evident in trans-Straits transports. Port functions are dissociated between the two cities: Dumai, located on the Straits, is Central Sumatra's main export port, while the river port of Pekanbaru, located on the lower Siak, is more specialized in imports towards the regional capital. In the ranking of the public company Pelindo 1, which manages the ports of Dumai and Pekanbaru, Dumai is classified as a first-class port whereas Pekanbaru is rated second

class.

Complementarity in transport functions: an export port versus a regional port and an air hub

Dumai is primarily an export port, 80% of the province's export value transits through its ports (BPS Riau Province Statistics Yearbook, 2008). The city has a general port and ports specialized in palm oil[xv] and hydrocarbons, which are the province's two main exports. Certain ports are managed by the public company Pelindo and others by Chevron. Dumai is also the most important ferry terminal to Malaysia from central Sumatra in terms of the number of weekly trips; as well as being the scene of all forms of trafficking with the other shore: smuggling, migrants and drugs. Dumai could become Riau's main export port for the province's products to the other side of the Straits. It could even play this role for all of central Sumatra as it is capable of draining goods from West Sumatra, the southern part of North Sumatra, and the northernmost part of Jambi.

The MP3EI Master Plan draws a transverse corridor through central Sumatra, connecting Padang to Pekanbaru and then Batam, but not Dumai, suggesting that Batam's port could take over the export flows of West Sumatra. However, Batam's utterly outward orientation that maintains few ties with the hinterland of Riau, with its free zone status, and operating more like an enclave than a gateway to Indonesia, renders this hypothesis implausible. Dumai could better play this role for the central region of Sumatra if, besides the improvement of Sumatra's roads, connections were facilitated with the Straits' other shore. Two projects, under way since the 1990s, tend to limit the impact of transshipment constraints between both shores. The first is a project for a bridge between Dumai, Rupat, and Melaka, supported by Riau province and the State of Melaka. While this is not an Indonesian state priority, it could receive funding as part of the IMT-GT because Dumai-Melaka is one of the transversal corridors of the growth triangle. Second, there is the long overdue establishment of a shuttle ferry (Ro-Ro), whose infrastructure, a 110m pier and a terminal, have been completed on the Indonesian Dumai side ; but not yet on the Malaysian shore.

Pekanbaru's harbour functions complement those of Dumai[xvi]. Half of the province's import value transits through the ports of Pekanbaru (BPS Riau, Riau in Figures, 2008), specialized in container transport. The old port, inside the city, is declining due to its limited accessibility[xvii]. The port of Pekanbaru is currently the Port of Perawang, located downstream on the Siak River[xviii] (ie. **Map 11.4**). Pekanbaru does not handle large vessels, which cannot navigate up the Siak. This has become even truer since 2007 when the construction of a bridge in Siak Sri Indrapura, only 23m high, permanently prevented the passage of large ships. Imported goods are transported by tug boats or on barges loaded with containers that navigate up the river and are loaded in Kuala Lumpur or in Singapore[xix], more rarely after transshipment in the port of Dumai or Bengkalis. The expansion planned by Pelindo 1 in the port of Perawang (dock extensions, expansion of the container storage area, adding two crawler cranes to accelerate unloading) attests to the importance of this traffic that consists mainly of imports transported by container. As long as the road from Pekanbaru and Dumai is not redesigned, Pekanbaru port is also an alternative to Dumai port for exporting products from West Sumatra and Riau. In 2008, Perawang was the province's third port in terms of export value (which represented, however, only 6% of the province's export values, compared to Dumai's 80%). However, Pekanbaru's port activity will always be limited by the physical constraints inherent in river ports.

Nevertheless, Pekanbaru is Riau's air hub for service to the other side of the Straits, an important function at a moment when low-cost air transportation is competing with ferry

transportation. Pekanbaru is connected to major cities in Sumatra and Jakarta as well as Kuala Lumpur, Melaka, and Singapore, by scheduled airlines (Garuda) and low-cost airlines such as Tiger Airways, Lion Air, Batavia Air, and Air Asia. Riau province also established the Air Riau airline to link up to Dumai, a cost-effective option as long as the highway connecting the two cities is not completed. It also flies to major cities in Sumatra as well as Jakarta. In January 2011, it opened a Pekanbaru-Melaka line, which could be extended to Bangkok. The airport's expansion is 80% complete.

Complementarity in economic functions: industry versus services

The two cities are also complementary in terms of activity sectors, secondary for one and tertiary for the other. These specializations will no doubt be strengthened with each new project. Dumai has a confirmed industrial vocation. Its location along the border, as well as its activities, have designated it as a National Strategic Center of Activity in mid-term national planning (RPJMN 2010-2014), with the status of a Special Economic Zone with port infrastructures and direct links to Sumatran corridors. Beyond storage activities and refineries for crude oil (Pertamina and Chevron) and palm oil (Wilmar facilities), Dumai's five industrial zones[xx] will ultimately host export industries, particularly post-extraction palm oil facilities. Of these five zones, the most dynamic is Pelintung (Kawasan Industri Dumai or KID), inaugurated in 2010, with an export platform capable of handling up to three tankers. One of the country's largest fertilizer plants has already been built there. Though barriers to the installation of these industries have been lifted, notably poor roads (palm fruit must be processed quickly) and difficulties obtaining raw material at competitive prices[xxi]. Taking advantage of the proximity of the Straits of Malacca, the central government's project also provides for the creation of a shipyard that should ultimately take over Java's facilities.

Pekanbaru is not lacking in industry; but its focus is more on the processing industry and consumer goods (food industry, wood products...). An industrial zone is under development at Tenayan on the city's eastern ring road; however, national planning has not included any major projects in Pekanbaru in these sectors of activity. Pekanbaru concentrates high-level tertiary activities and administrative functions at the provincial and municipal levels. Riau's largest oil producer, Chevron (PT Chevron Pacific Indonesia, or CPI), has established its headquarters in the city; Pertamina, the state oil company, has done the same for its Riau headquarters. The city is also home to a large number of companies working in conjunction with oil or plantation industries, particularly in transportation and equipment supply. The city's thirty-three public and private banks manage the highest assets in the province, ten times higher than in Dumai (Bank Indonesia, Regional Economic and Financial Statistics). Pekanbaru also houses the consulates of Singapore and Malaysia.

Paired operations in the making

This paired operating system between Pekanbaru and Dumai suggests a hierarchical relationship between a centre of command, Pekanbaru, and a centre for production and maritime interface, Dumai. This hierarchical relationship is also shown by the higher level of equipment in Pekanbaru as compared to Dumai, and its ongoing metropolization process.

Pekanbaru's level of equipment is unparalleled in Riau's other cities. The number of international level hotels in the city attests to its role as a business destination[xxii]. Pekanbaru is also a university town, with a public university and several private universities (ie. **Map 11.4**). Hospital care has recently expanded with the construction of a large public hospital completed in 2007 and two private general hospitals. Since 2009, a mass public transport system has been brought into service with the Trans-metro Pekanbaru, an air-conditioned

scheduled bus system serving three routes, to be expanded to six in 2011, a very rare service in medium-sized Indonesian cities. The city bears physical evidence of the start of a metropolization process, driven by the internationalization of the province's economy and amplified since the 2000s by the financial capacities of decentralization. The city centre has been reconfigured and different business centres have sprung up with the construction of large north-south arteries. New buildings have sprouted along these avenues, emblems of the city such as the main library or the province's new headquarters. Currently, luxury estates are opening up along new axes, especially around the Sudirman Square, on the road to the airport. In addition to large hotels, several modern malls have been built, including one by Ciputra, one of Indonesia's largest developers. In Asian cities, the crossing of rivers by the built environment and development of river banks are some of the signs of ongoing metropolization processes and account for a change in urban scale. In Pekanbaru, the construction of several bridges on the Siak and the continuation of the ring road on the other side of the river allowed the expansion of the urban built environment towards the Chevron industrial area of Rumbai. Besides the Chevron headquarters, huge facilities, such as hospitals, universities or the large stadium that will host most of the events of the 28th National Sports Week in 2012, create new polarities there. The development of the riverbank was initiated near the first bridge crossing the Siak and should continue with the installation of a water front city including the old port; a project supported by the Province, but still in need of investors. In comparison, Dumai's internationalization through its transit, export and industry functions, does not produce similar markers of metropolization and its urban landscape has hardly changed.

This complementarity between Pekanbaru and Dumai, however, must be organized as equivalent powers granted to both cities by decentralization could trigger competition and undermine existing synergies. For example, the Municipality of Dumai is already planning to expand its airport runway to accommodate the Boeing 737s of international airlines and open a direct line to Batam, thus bypassing Pekanbaru and creating new alliances between those two port cities. The possibility to function as paired cities is also highly dependent on the rapid execution of the redesigning of the road and rail transport system between the two cities, which alone would allow an efficient connection between the two cities and with the Straits maritime flows.

Conclusion

The fact that cities are closely and deeply affected by globalization is not a new concept. Cities function as hubs, articulating material and immaterial flows through their infrastructure and services, as well as handling the presence of transnational actors. Are global flows responsible for urban development or, conversely, is it investing in infrastructures, particularly transport and services, that renders global flows possible, all the while generating specific urban configurations? Globalization impacts cities at all hierarchical levels. This influence is visible in their capacity to command and control flows: the network of large cities is made denser by second-tier cities and by a series of towns with lesser command capabilities which are nonetheless developing connections with global flows. The bottom tier of the urban hierarchy of cities affected by globalization appears highly complex and is rarely studied.

In Asia today, there exists a context of generalized trade liberalization coupled with an ideology, driven notably by the ADB but widely used elsewhere, that focuses investments on corridors to optimize returns, to promote trans-national integration, and in some cases to open up peripheral territories. This general context promotes the emergence of new types of nodes

along these corridors, which operate as twins or are paired with other urban constructs. Along the land borders of mainland Southeast Asia and the Malay Peninsula, these hubs are mainly positioned on the periphery of national territories, on both sides of the border, at the corridors' national crossing points. They are additional nodes within urban hierarchies. These border cities often pair with higher-ranking, inland cities that handle command functions in administrative, logistic or economic sectors. In maritime Southeast Asia, urban pairs emerge between ports and regional inland cities or dry ports.

There is a marked imbalance in the urban and port hierarchies that structure the flow between both sides of the Straits of Malacca and a discontinuity of these hierarchies in central Sumatra, at Straits as well as at island level. As Sumatra is structured by Medan to the north as the island's main international port and Palembang to the south providing access to Jakarta, the emergence of Pekanbaru and its port connection on the coast in Dumai will likely reduce this discontinuity, a function that could not have been taken over by one of these cities alone.

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Notes

[i] See for instance the GAWC's renowned roster which ranks cities based on their connectivity through advanced producer services, thus measuring their degree of integration into the world system. *www.lboro.ac.uk/gawc/*)

[ii] See the results from "New regional organization in Oriental Asia" (NORAO) research program, which focuses on new regional patterns that emerge within the regionalization of the world system (Pelletier and Taillard, 2004) which show the permanence of the Pacific-Asia maritime axis and of the structural hubs of this

asian maritime corridor. (Tertrais, 2004; Taillard, 2004(b). See also Gipouloux, 2011)

[iii] See Franck, Goldblum, Taillard (eds.) 2012 for a study of metropolization processes in Southeast Asia second tier cities.

[iv] The IMT-GT growth triangle is a trans-national cooperation area, supported by the Asian Development Bank (ADB). The institution was created in 1993 to encourage economic ties between regions belonging to three national groups. It covers the southern provinces of Thailand; the north of Malaysia; and Sumatra, after the addition of several Indonesian provinces.

[v] Riau province was created in 1957, when Sumatra's three provinces were subdivided. These provinces were originally created with the establishment of the unitary Republic of Indonesia in 1950. The subdivision resulted in the resumption for the most part of the limits of the former colonial Residencies, in order to better account for regional specificities and improve administrative control. The province of Central Sumatra is divided between western Sumatra, Riau, and Jambi. The capital of the province of Riau was, for two years, Tanjung Pinang, on the island of Bintan, seat of the former sultan of Johore Riau in the 18th century and then the Dutch Residency. It had always been very oriented towards Singapore. The capital moved to Pekanbaru in 1959, when Caltex discovered new oil deposits and decided to finance the construction of infrastructures for the city such as roads, universities, and hospitals....

[vi] 70% of Indonesian oil, a major part of Indonesia's economy, was exported from Dumai in the 1970s and 1980s, thanks to the province's abundant deposits (Colombijn, 2002)

[vii] The physical structure of the island of Sumatra is composed of a series of longitudinal, physiographic groupings with, from east to west, a marshy plain opening out to the Straits of Malaca and a relatively barren peneplain, and the Barisan mountains whose valleys concentrated populations. There is also a narrow plain overlooking the Indian Ocean. Sumatra is drained by a series of rivers with transversal orientations that begin in the Barisan mountains and flow in vast loops towards the east before flowing into the Straits of Malacca and the short rivers to the west.

[viii] Decentralization has notably resulted in the creation of new administrative entities. For example the district of Bengkalis, divided into 3 districts (Bengkalis, Rokan Hilir, and Siak) and 1 municipality (Dumai), has helped small cities accede to the rank of administrative centre. The small port town of Tanjung Siapi-Api has thus become an administrative centre with immense administrative buildings marking the entrance to the city.

[ix] The province of Kepulauan Riau consists notably of the islands of Batam and Bintan, whose development as an industrial and resort extension of Singapore has been entirely planned and managed by the central government since 1990.

[x] For example, cultural associations, such as Dunia Melayu Dunia islam (Malaya World, Islamic World) based in Melaka, bring together representatives from Sumatra and the Peninsula. There are a number of student exchanges between Islamic universities on both shores.

[xi] Until 2006, planning documents mentioned the 50 Km Duri-Dumai section as a feeder of the eastern trans-Sumatran route, which was given the status of national route. Since, it has become a part of the trans-Sumatran route.

[xii] Though it has paved the way for logging and the expansion of plantation crops along the route throughout the central-eastern zone of Sumatra, it also risks creating new inequalities with departments that are far from the route.

[xiii] See the Ministry of Transports, 2008. This study compares the result of the origin-destination survey of 2001 and 2006.

[xiv] See Ruth Banomyong's article in this volume and the IMT-GT website http://www.imtgt.org/Documents/Books/roadmap-development.pdf

[xv] The special port for crude palm oil export in Dumai is also operated by Pelindo 1. It is the largest port handling exports of crude palm oil and derivatives in Indonesia. This port is equipped with various facilities for loading and unloading goods, especially crude palm oil.

[xvi] The traffic from Dumai and Pekanbaru does not of course exhaust the totality of Riau's maritime flows with the Malaysian peninsula. Several large companies, established along the Siak, notably handling wood pulp, own their own docks and export their production directly from their own docks to the other shore of the Straits or by shipping their production to ports located at Siak's mouth, such as Sungai Paknin. Furthermore, small ports dot the coast, exchanging copra - sometimes even as far as Singapore – and latex for basic consumer goods across the Straits.

[xvii] Especially since the municipality has forbidden trucks to circulate on the roads to the port.

[xviii] The city's old port, Pasar Bawah, and the Perawang port are managed by the Pekanbaru branch of the public operators of Pelindo 1 ports.

[xix] Several Singaporian and Malaysian navigation companies stop at Pekanbaru. A regular barge service was established in 2003 between Northport, the container terminal of the Kuala Lumpur port, and Perawang.

[xx] Pelintung, Lubuk Gaung, Dockyard, Bukit Kapur, and Bukit Timah. The Special Economic Zone covers a surface of roughly 1000 ha and benefits from fiscal incentives.

[xxi] Four Indonesian exporters of crude palm oil hold the near-monopoly of the market and impose high prices.

[xxii] There is one 5 stars hotel and six 4 stars hotels, all of international standing. The majority belong to large Indonesian real estate development companies.