

FORGING ASIA'S GLOBAL TRANSPARK IN THE PEARL RIVER DELTA AT ZHUHAI

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ABSTRACT: The main purpose of the paper is to introduce the concept of the Global TransPark (GTP). It is a critical time to develop air logistics infrastructure in the New Economy. The paper also presents a brief review of the air cargo industry in the Asian-Pacific region and China, in particular China's development in the industry as its economy has grown rapidly and globalized in the past two decades. The paper argues that China needs to develop a GTP to support its future growth, and explains why the Pearl River Delta-Hong Kong-Macao city-region or Extended Metropolitan Region (EMR) is the best location. Finally, it proposes that Zhuhai Airport, one of the five airports in the EMR, is the best site for the GTP. New policies from Chinese government as well as close cooperation between local governments of Guangdong and the two Special Administrative Regions of Hong Kong and Macao will be needed to make the establishment of the GTP possible.

KEY WORDS: Global TransPark; airport; air cargo; transport; Hong Kong Extended Metropolitan Region; the Pearl River Delta; New Economy

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1 NEED FOR NEW COMPETITIVENESS IN THE PEARL RIVER DELTA

In 1978 China adopted a new approach of Open and Reform in its development. Prior to this, Hong Kong was a British-run enclave of free trade, and was little related economically with its next door neighbor and natural hinterland—the Pearl (Zhujiang) River Delta (PRD) (SIT, 1991). Since then, local initiatives of Guangdong Province and its constituent municipalities have provided an attractive milieu for Hong Kong investment. It has soon grown into Hong Kong's new manufacturing base while Hong Kong itself expanded its producer services and port functions to support it. The new cooperation has integrated Hong Kong and Guangdong, in particular its most developed core, the PRD, into an urban economic region—the Extended Metropolitan Region (EMR). Indeed, the *Front-shop; back-factory* model of the EMR with its distinct role in the global economy benefited both Hong Kong and Guangdong in 1978–2000. It is an example of how a local economy has found a niche in the global econo-

my and successfully made use of globalization forces for steady and rapid economic growth (SIT, 2001).

At present it is generally agreed that the Hong Kong-Guangdong partnership needs to be re-examined with an angle to raise the degree of cooperation and nature of the economy of both parties to meet new challenges. The latter includes the changing world market in the information age, increasing international competition and de-regulation, as well as China's entry into WTO in 2002. The predominance of export-oriented, labor-intensive, and low skilled consumer industries that have supported the EMR's growth in the past two decades will be likely to decline in significance in the future. New competitiveness has to be forged in the PRD to upgrade the level of development there as well as for exploiting new market situations in Asia and the world.

In this paper, we propose a joint effort by Hong Kong and Guangdong in forging Asia's first and potentially largest Global TransPark (GTP) as a new competitiveness of the Pearl River Delta in the new global economy. The GTP will be a critical core infrastruc-

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ture for the EMR as it can effectively exploit existing comparative advantages of Guangdong and Hong Kong and be able to harness the flexibility and accommodative edges of Hong Kong's special geo-political, socio-economic and administrative attributes under 'One country, two systems'. In short, the GTP will act as a catalyst and springboard for the development of many related activities in the New Economy, such as hi-tech just-in-time (JIT) assemble industries, e-commerce, air-express and air cargo hub activities. We shall turn first to introduce the GTP concept and approach. Then, we shall highlight the advantages of Hong Kong-Guangdong cooperation and the Zhuhai site to support the proposal that the PRD is the best location for China and Asia's GTP.

2 GLOBAL TRANSPARK AND WORLD AIR CARGO GROWTH

KASARDA proposed the concept of Global TransPark (GTP) in 1992 (KASARDA, 1998). The world's first GTP soon started construction through the conversion of a small airport at Kinston in North Carolina of USA in 1998. The master plan for the second GTP sited at Utapao in Thailand was approved and construction started in 2000. In Mckenburg, Germany, another GTP plan was drawn up in the end of 2000 (KASARDA and SIT, 2000). The central cargo facility, a key infrastructure of the GTP was put into use in 2001 in the GTP at Kinston. By the end of 2002, it had handled a throughput of about 60×10^3 t (www.ncgtp.com). Subic Bay Airport in the Philippines and Liege Airport in Holland also refocus their development strategy on air cargo since the mid 1990s by adopting GTP features. The former has become Fedex's Asia hub, handling about 60×10^3 t of air cargo in 2001. The latter is now TNT's European hub, handling 326.9×10^3 t in 2002 (www.fedex.com;www.liegeairport.com). Both are successful examples of quasi-GTP operation.

GTP has been described as a potential fifth wave in global economic development history. It provides a new means for agile manufacturing and retailing in an increasingly globalized and competitive world. As a vital cost minimization and productivity-enhancing avenue, GTPs will form new network hubs for international competitiveness. The GTP will be equated with the container invention of the late 1960s in its significant impact in the first few decades of the 21st century on the mode of cargo movement and location for major growth industries and trading malls. In some way, Subic Bay Airport's impact on the development of

Subic Bay Special Economic and Free Trade Zone, i.e. the creation of over 40×10^3 jobs and generation of over $\text{US}\$1 \times 10^9$ exports in 2001 (by air), is the evidence of the importance of air logistics on the development of high-tech industries and job creation related to logistics (www.sbma.com). Put simply, it will become a pivot for regional development by combining the major new development trends for regional development in global manufacturing, trading, and business, i.e. 1) new technology such as those in telecommunication, automation and transport; 2) demand for agile and express transport; 3) popularization of JIT in manufacturing; 4) global sourcing for parts and components; 5) multi-location production system; and 6) globalized market.

As a breakthrough design concept, the GTP integrates the above newest technology and organization trends into a new growth center, rendering development to a huge surrounding hinterland. It works through: 1) a multi-model transport hub with air cargo facilities as the core, linked directly to efficient expressways, rails and water transport to form a new transshipment center; 2) an advanced telecommunication and computer center linked to the hinterland and the world for instant data gathering, processing and transmission for extending and intensifying its market coverage and material sourcing; 3) utilizing the above for time- and cost-saving agile manufacturing for a global market; and 4) a trade and warehousing center for regional and global markets.

In value terms, global air cargo has been rising in proportion in world trade at the expense of other means of cargo transport, especially for the most rapidly increasing commodities in telecommunication and personal and household consumer durables. In the USA, in 1992, for example, 81% of the export of micro-electronics, 92% of aircraft engines, 90% of pharmaceuticals, 96% of photogrammetry products, 99% of watches, 71% of leather garments, 55% of men's woollen-ware, 52% of footwear etc. were by air. In the second half of the 1990s, world air cargo growth was 7% annually. It is forecasted that it will be about 9% for the first decade of the 21st century (Fig. 1) (Boeing Commercial Airplane Group, 1998). Asian-Pacific region will be growing faster than world average, as its annual rate has been 2% higher than world average.

Due to increasing scale economies, popularization of JIT manufacturing and new technology in telecommunication, global air cargo business has been moving towards the predominance of a few Multinational Corporation (MNC). The oligarches such as Fedex, DHL, UPS and TNT, with their hub business

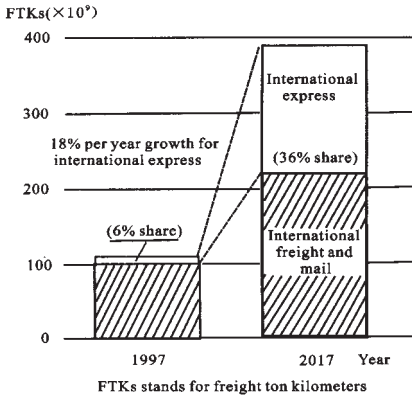


Fig.1 International air express becoming a major force

in future potentially centered around five or six hub GTPs to cover the whole world. At present, these oligarches have already developed quasi-GTP hubs which are important foci of the current air cargo business. For example, Fedex's North America hub at Memphis is at present the world's largest air cargo airport, handling over 2.5×10^6 t per year. It has also set up its Asia hub at Subic Bay as mentioned above. At Charles de Gaulle Airport, Fedex's European hub—EuroOne also has started operation in 2002 (www.fedex.com). Given time, many of these hubs or industrial airport will adopt full GTP design and functions. They will thus become vital growth centers of the new global economic order, serving as gateways and entrepôts for air cargo into and out of host countries or continents, international industrial centers for export-oriented processing of high-tech and high value-added products, and as global trading and commercial centers based on air cargo and related air-transport.

Timely development and successful operation of a GTP will thus be a major competitive advantage for a region or country for pugging into the global air cargo circuit and global economy so as to enhance its development in the New Economy.

3 CHARACTERISTICS OF GTP AND ITS CARGO AND INDUSTRIAL POTENTIAL

At present, most air cargo is still moved by passenger-carriers, a characteristic of the air cargo industry that already existed in the mid 1960s (SEALY, 1966; RIMMER, 1998). An average passenger 747 may carry up to 30t cargo. Medium-size special cargo-carrier can also carry up to 30t. The most efficient cargo carrier, however, is the 747 cargo-freighter which can carry more than 100t. Cargo-carriers may be provided with special parking space and cargo handling facilities

to further increase their efficiency. Dedicated and well-designed cargo handling centers equipped with advanced telecommunication infrastructure and liberalized custom clearance can cost-effectively implement a door-to-door air cargo service to minimize costs and risks for both industrial and commercial customers and this is a basic design principle of the GTP (Fig. 2) (KASARDA and SIT, 2000). The trend for the separation of air passengers and air cargo has recently been further promoted by new government measures, as a response to the 9.11 Terrorist Attack on the USA in 2001.

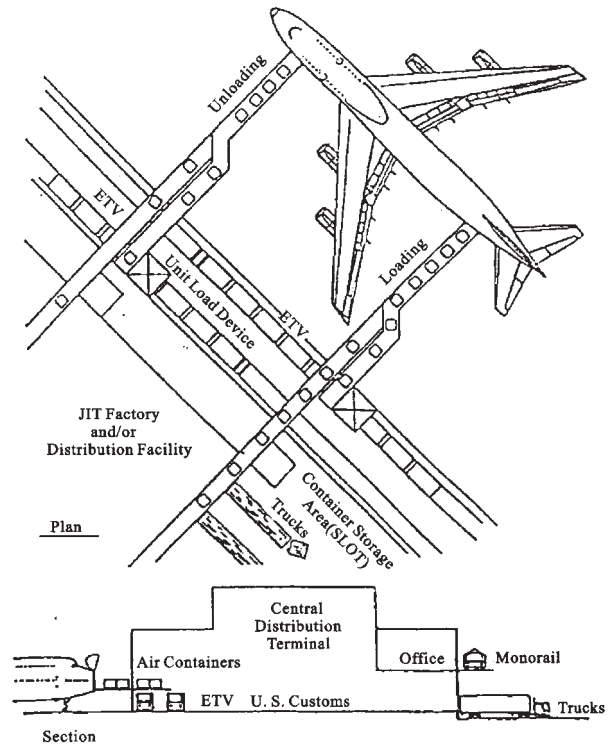


Fig. 2 Intermodal interfaces at the Global TransPark

Put simply, the GTP is primarily a cargo-cum-industrial airport. It can achieve high efficiency for air cargo throughput and related value-added activities yet minimize cost and risk, through a number of design characteristics and signature operation features. Foremost among them are: 1) state-of-the art customs clearance procedures including: pre-clearance of arriving aircrafts; electronic data interchange; transparent tariffs; and uniformly applied tariffs; 2) open skies access including: seventh freedom rights; change of gauge rights; co-terminal rights; and ground handling rights; 3) in-transit bonded status; 4) complimentary industrial zones, on-site and off-airport site.

Obviously, cargo services attracted to a GTP will be those with a high ratio of monetary value to weight, e.g. computer components, jewelry; those being of high perishability, e.g. vegetables, fruits, fresh seafood and flowers; fast delivery, e.g. JIT inventories for automotive and electronics industries; and those being of high time sensitivity, e.g. documents and product samples.

When operating in full-swing the GTP can enable industrial and retailing customers to keep a two-day inventory stock. Hence it can help to minimize costs and increase ability in market-response, which are pre-requisites for JIT assembles, and e-commerce.

The success of Subic Bay Airport, Liege Airport and the global hub—Memphis Airport serve to indicate that the GTP is dependent on, as well as will support or induce, the growth of a host of industries, i.e. packaging, processing and other value-added activities that use the GTP's multi-model design for export-oriented as well as import-substitution manufacturing. Potential industries that will be attracted to the GTP and its surrounding industrial zones include: 1) semi-conductor; 2) computer and electronic sub-assembly; 3) aircraft parts suppliers and aircraft maintenance; 4) processing of perishable products like seafood, vegetables and flowers; 5) industrial suppliers like machine tools; 6) optics and small precision equipment manufacturer; 7) garments, footwear, and fashion accessory suppliers; 8) pharmaceuticals; 9) automotive component makers and spare parts suppliers, and 10) jewelry and watch makers.

In short, the GTP is not just an air-cargo facility in the traditional sense. It is in fact a time critical logistics and manufacturing hub geared to highly time sensitive and personalized products and services demanded by e-commerce and new information technology of the 21st century.

4 CHINA'S NEED FOR GTP

4.1 China's Increasing Economy Globalization

Since China has adopted the Open and Reform Policy in 1978, her economy has been increasingly integrated with the global economy and world market, as may be illustrated by a few indicators:

(1) By 1995, a number of provincial units had already registered a FDI/GDP ratio in excess of 10%, including Hainan (33%), Tianjin (19%), Guangdong (19%), Shanghai (18%), Fujian (16%) and Beijing (12%).

(2) Regional export-oriented economies have appeared, among which Guangdong's international trade value was 146% of its local GDP by 1995. Local economies with a ratio above 50% include Shanghai (65%), Tianjin (59%), Fujian (57%) and Hainan (52%).

(3) By 1996, a number of products exported by major MNCs had already occupied substantial proportions of China's domestic market, e.g. detergent (35%), cosmetics (36%), soap (40%), pharmaceuticals (13%), beer (20%), motor vehicles (68%), escalators and lifts (70%), colour TV tubes (65%), automatic exchanges (90%).

(4) In China's annual domestic sales of 3 million personal computers in 1996, 2.5 million pieces were imported (National Bureau of Statistics of China, 1998).

The trend of further increase in demand for these and similar products provides one of the important conditions for an expanding air cargo business in China.

4.2 Potential in China's Import and Export for Air Cargo Growth

In China's (mainland only) total international export of US\$182.7×10⁹ in 1997, 57.8% (US\$100×10⁹ in value) can be airlifted. In fact, a substantial amount were transported into Hong Kong by land and water and thence re-exported by air. Similarly, of the annual US\$132.8×10⁹ value of international import into China, garments, special equipment, electrical and related parts and components, automatic equipment and data processing equipment, telecommunication and audio equipment, computer chips, automobile parts and components, aircraft and space-craft equipment and precision calibrators, US\$61×10⁹, can be largely air-lifted^①.

In 1997, China's (mainland only) total air cargo throughput was 2.528×10⁶t, only 23.1% of which was international cargo (National Bureau of Statistics of China, 1998). A substantial portion of China's total air cargo export and import was handled in the Hong Kong Airport. The latter had a total air cargo throughput of 1.79×10⁶t in 1997 (US\$83.9×10⁹ in value). Air cargo accounted for 17% of Hong Kong's re-exports in value whose origin or destination is mainly the Chinese mainland. In 2001, about 70% of Hong Kong's air cargo was reported as transshipment for the mainland, 15% as international transshipment and only 15% originated or destined locally (Hong Kong SAR Govern-

① Campbell-Hill Aviation Group, Inc., 1998. An Analysis of Economic Benefits from Full Liberalization of Integrated Air Express Service in the Asia-Pacific Region: A Case Study of China[R].

ment, 2003). It is estimated that the total international air cargo demand of China's mainland may reach 6×10^6 in 2010. As such there is an urgent need for establishing a dedicated cargo-industrial airport in the form of a GTP hub to cater for the perceived demand and to enhance China's international competitiveness (KASARDA and SIT, 2000).

4.3 Constraints on Air Cargo Growth in China

As previously said, China's (mainland) air cargo capability is and will increasingly be a critical factor for enhancing her international competitiveness, in attracting more FDI and foreign affiliates to operate assembling plants and logistics platforms in the country, as well as in efficiently promoting growth of the economy through cutting down costs through global sourcing and increasing sales to the global market. At present such a potential has been substantially underdeveloped as its realization has been seriously constrained by a number of factors: 1) absence of a transparent, reasonable and efficient customs clearance and tariff system; 2) too many non-tariff barriers and executive fees for an efficient air cargo business; 3) airport designs in

China's cities are inadequate for efficient air cargo handling; 4) an absence of dedicated air cargo airport, and a lack of division of function in passenger and air cargo roles in the airport; 5) no advanced computer and telecommunication facilities at airports to meet JIT delivery and modern logistics requirement; 6) insufficient liberalization in the air cargo business to enable the exploitation of MNC capability and technology in developing a modern and effective air cargo sector; and 7) over-reliance on the Hong Kong airport whose location, management and costs are far from ideal.

As illustrated by Table 1, by GDP (by Purchasing Power Parity, ppp), China (mainland) was already Asia's largest economy in 1997, yet its export by air is among the lowest by proportion of total export in the region. Real growth and FDI increase of the Chinese economy are consistently rapid for 1996–2003. Attention towards increasing growth of its air cargo industry and hence air logistics have been long overdue. Recently, increased voice for drastically upgrading China's air logistics infrastructure and forging China's GTP has become an urgent issue (TIAN, 2003; TSANG, 2002; SIT, 2002 and Macro Economic Research Institute, 2001).

Table 1 Economic indicators and growth projections of ten Asian-Pacific Economies^①

Country (region)	Population ($\times 10^6$)	GDP					International trade growth(1996–1999*)				FDI(1991–1996)	
		1997	1997	2003	PPP real growth (%)		Export (%)	By air (%)	Import (%)	By air (%)	Total (US\$ $\times 10^9$)	Average growth (%)
		Gross (US\$ $\times 10^9$)	Per capita (US\$)	Forecast gross (US\$ $\times 10^9$)	1996–1999*	1996–2003*						
China	1239	3945	3183	6502	8.4	8.5	9.3	7.6	6.1	15.3	154.973	15
Hong Kong	6	152	23030	188	3.7	3.5	5.4	43.8	6.2	14.8	20.856	14
Singapore	3	75	24194	107	5.9	6.0	5.8	25.3	5.8	23.3	33.609	26
Malaysia	22	208	9498	260	4.6	4.2	18.8	17.1	17.3	23.2	27.961	2
Indonesia	202	815	4043	903	1.0	2.1	4.6	5.6	-7.1	6.0	19.680	58
Philippines	73	217	2989	288	4.6	4.8	9.8	48.0	8.2	14.4	6.487	4
Thailand	61	491	7997	524	-0.6	0.9	4.9	13.8	-5.1	16.8	11.609	12
South Korea	46	564	12234	716	2.9	2.9	14.6	24.2	4.5	20.3	7.388	58
Chinese Taipei	22	330	15068	482	6.5	6.4	8.3	18.0	9.7	16.6	7.403	15
Japan	126	2948	23378	3332	0.9	1.7	4.4	10.3	1.6	23.3	5.845	2
Total	1800	9745	5411	13302	4.4	5.0	8.0	15.2	5.3	18.7	285.811	18

* estimated value

5 THE PEARL RIVER DELTA AS SITE FOR CHINA AND ASIA'S GTP

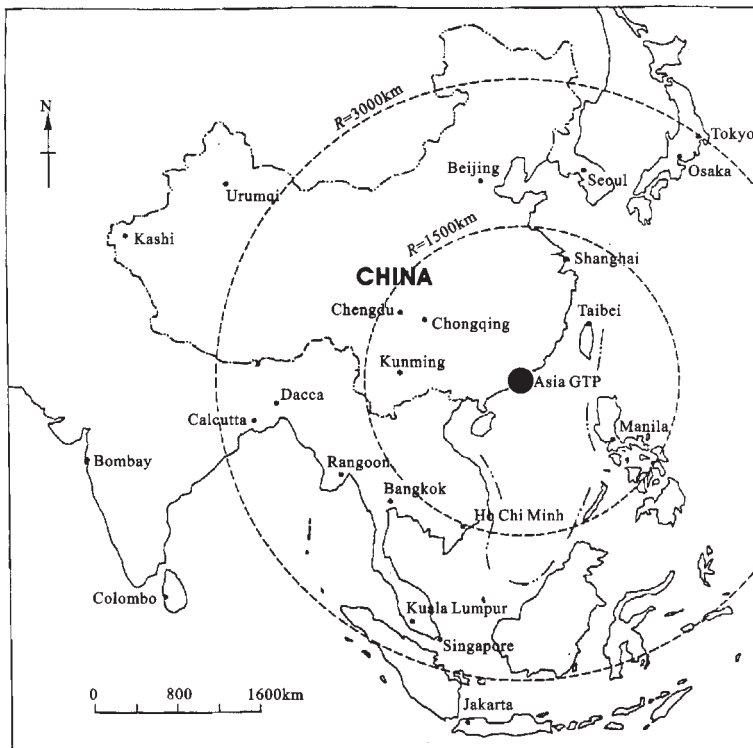
Comparing with potential competitors in East Asia, such as Seoul, Singapore, Kuala Lumpur, Subic Bay, Utapao and the Changjiang Delta, the Pearl River Delta stands out economically and in terms of major port and airport infrastructure. Firstly, it is China's most devel-

oped and fastest growing region which has about 25% (including Hong Kong and Macao) of China's GDP in 1999, with an export-oriented economy. The PRD (excluding Hong Kong and Macao) accounted for over 75% of Guangdong's GDP in 2002. It is estimated that Guangdong's international trade will grow by 14.8% in 1998–2010. Thus, the PRD alone will generate a huge air cargo demand which may be around 3×10^6 (inter-

① Campbell-Hill Aviation Group, Inc., 1998. An Analysis of Economic Benefits from Full Liberalization of Integrated Air Express Service in the Asian-Pacific Region: A Case Study of China[R].

national cargo) in 2010 (KASARDA and SIT, 2000). Secondly, it has an excellent geographical location for international trade. The Hong Kong Airport is at the confluence of major European, American, East Asian and Australian inter-regional air-routes (Fig. 3). It has independent air rights guaranteed by the Basic Law that no other Chinese airport and city enjoys (except Macao). In addition, the Guangzhou and Shenzhen airports are two of the largest airports in China's mainland. Their combined passenger and cargo volume surpass either one of the two top ranking airports in China, i.e. the Beijing Airport and Shanghai Airport (Table 2).

Thus, the five major airports in the PRD (recently joined together in an informal alliance called A5 for working towards closer cooperation) together offer an efficient coverage of major East Asian, Southeast Asian and the China markets (Fig. 3). The major cities there can be reached from A5 in three hours by air and the summation of potential flight paths from them to Asia's airports is the lowest compared to all other Asian airports. At present the combined daily international flights of the Hong Kong and Macao airports exceed 600, the largest amount in Asia within any metropolitan region. Moreover, A5 primarily the Guangzhou and Shenzhen airports, register a daily



Source: SIT, 2002

Fig. 3 Location of Asia's GTP and its 3-hour flight hinterland

flight frequency of about 500 flights to China's major cities (www.hkairport.com). This provides an important network for global businesses, as the China market will be increasingly important in the overall Asia and world market. Putting Asia's GTP in the PRD can provide the business world with the most cost-effective marketing and distribution platform to international business in the Asia-China market. Besides, A5 are at close proximity to major seaports, inter-regional trunk railways, expressways as well as river transport routes for effective multi-modal connections and the achievement of seamless door-to-door service (Fig. 4).

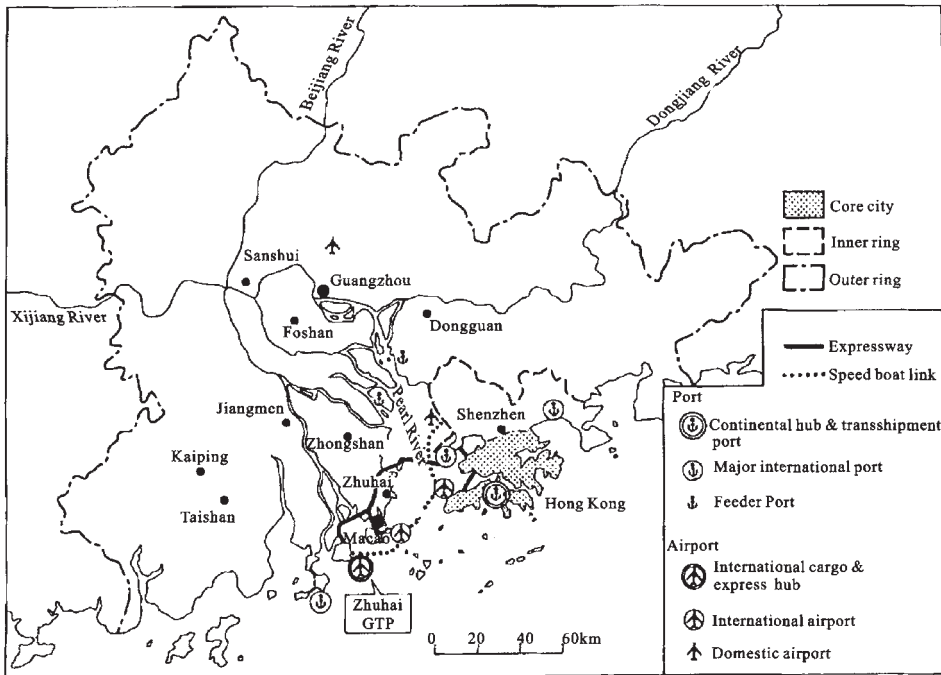
Among the A5, Zhuhai is currently confronted with

a situation of poor passenger business, as it is a 'dead end' with no international flights and located too close to major passenger airports such as Macao, Guangzhou and Shenzhen. Zhuhai's well-equipped and sizable airport may be readily turned into a GTP and cut down the time and cost in constructing of a GTP from scratch (Fig. 5) (KASARDA and SIT, 2000). As most parts of the PRD is well-planned with the best living and working environment in South China, while Hong Kong and Macao are long-established cosmopolitan cities, the EMR is therefore also conducive to high value-added and R&D activities, and is attractive to high skill manpower from the rest of Chi-

Table 2 4 Largest Chinese airports

			1990	1991	1992	1993	1994	1995	1996	1997	1998
Guangzhou	Passenger	($\times 10^6$)	6.05	7.45	9.02	9.27	10.70	12.57	12.64	12.51	12.41
		(%)	(14.8)	(23.1)	(21.1)	(2.8)	(15.5)	(17.5)	(0.6)	(-1.0)	(-0.7)
	Cargo	($\times 10^3t$)	12.5	15.1	17.1	18.8	23.4	27.9	32.1	35.2	40.8
		(%)	(18.4)	(20.8)	(13.2)	(8.2)	(10.9)	(19.2)	(15.1)	(9.6)	(15.9)
Shenzhen	Passenger	($\times 10^6$)	-	-	1.66	2.55	3.19	4.12	4.35	4.44	5.15
		(%)	-	-	(-)	(53.3)	(25.3)	(29.3)	(5.6)	(2.1)	(16.0)
	Cargo	($\times 10^3t$)	-	-	2.2	4.4	6.2	7.8	9.0	9.9	11.5
		(%)	-	-	(-)	(100.0)	(40.9)	(27.8)	(15.0)	(9.4)	(16.2)
Shanghai	Passenger	($\times 10^6$)	3.98	4.94	6.15	7.60	8.71	11.08	12.34	13.27	13.70
		(%)	(31.4)	(34.1)	(24.5)	(33.0)	(14.8)	(27.1)	(11.4)	(7.5)	(3.2)
	Cargo	($\times 10^3t$)	12.7	15.6	19.0	23.6	27.0	36.6	40.8	47.6	57.2
		(%)	(19.8)	(22.8)	(21.8)	(24.2)	(14.4)	(35.6)	(11.5)	(16.7)	(20.2)
Beijing	Passenger	($\times 10^6$)	4.82	6.31	8.70	10.29	11.64	15.04	16.39	16.91	17.32
		(%)	(7.2)	(30.9)	(37.1)	(18.3)	(10.3)	(29.3)	(9.0)	(3.2)	(2.4)
	Cargo	($\times 10^3t$)	14.2	15.2	18.7	22.5	24.2	37.1	39.0	45.7	51.1
		(%)	(40.6)	(7.0)	(23.0)	(20.3)	(7.6)	(53.3)	(11.5)	(17.3)	(11.8)
Proportion in national total	Passenger	(%)	48.8	46.9	47.8	45.4	43.5	42.8	41.9	42.4	42.7
	Cargo	(%)	59.9	58.1	57.3	56.4	53.9	55.6	52.8	53.8	55.7

Notes: Bracketed figures are annual growth rates. Source: Compiled from unpublished Chinese data



Source: Author, 2003 (unpublished)

Fig. 4 Extent of the Hong Kong extended metropolitan region and proposed division of the functions for its ports and airports

na and foreign countries.

On top of these, Hong Kong and Macao's financial and producer services provide vital support for global business that may operate in and via the GTP. Their economic autonomy under 'One country, two systems', long established practices in international trade and presence of a system of rule and law well accepted by international businesses, make them ideal coordinating center for globalized activities such as e-commerce, international transshipment of air express, JIT assem-

bling etc., which are related to the GTP.

6 PROPOSALS TO ZHUHAI

Since Zhuhai has already had a large modern airport which has been in operation for a few years, and the airport is suffering from little business, particularly due the Chinese government's policy to restrict it to domestic passenger business, it is desirable to be the site of the GTP by turning the existing airport into a GTP.

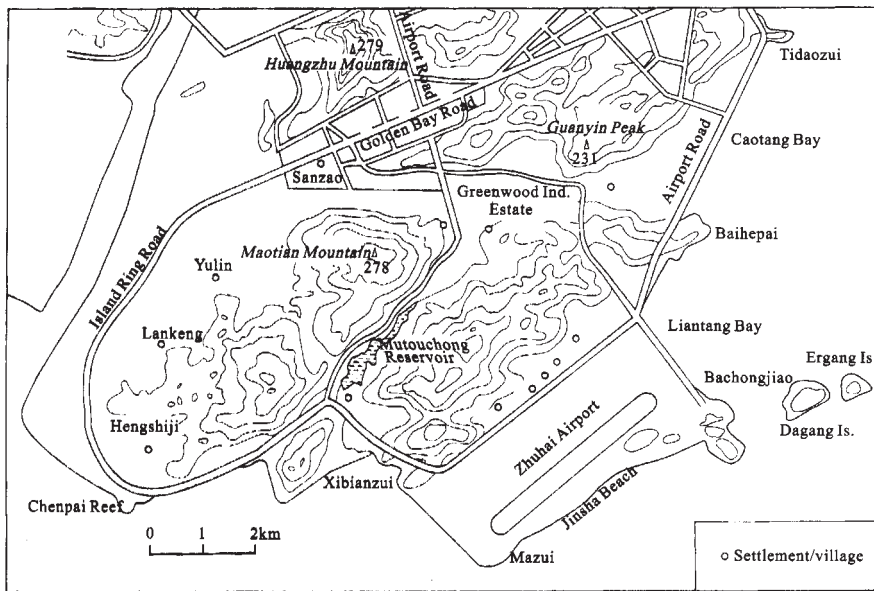


Fig. 5 Site of Zhuhai Airport

This can expedite early establishment of a critical air logistics infrastructure to harness the aforementioned comparative advantages of the PRD in the future global economy. Moreover, it will add to Zhuhai and the whole Hong Kong EMR a new dynamic for economic growth.

The Zhuhai Airport site has an excellent air space that is not at conflict with the Hong Kong, Macao and Shenzhen airports. It is also located a good distance from concentrated urban development compared with the Macao, Hong Kong and Shenzhen airports such that a large volume of night-flights for dedicated cargo airplanes will not be a problem. Its close proximity to Macao and Hong Kong also enables it to fully exploit the frequent international flights of these two airports for international multi-point airport-airport distribution and collection through the instigation of bonded high speedboats to link them up by means of 15–45 minutes trips (Fig. 4). This is an edge that no other Chinese airport possesses. For example, the largest mainland airport in Beijing only registered 361 international flights per week in 1998 (Table 3). The location of the GTP that can combine the China and Asia markets to be cost-effective and competitive cannot be anywhere other than within the EMR's A5, of which Zhuhai is most ideal.

Zhuhai Airport is also directly connected to both the new airports of Guangzhou and the Shenzhen by expressways (within 1 hour) (Fig. 4). Thus it can make use of their frequent flights to the cities of China's Mainland to cover the China market that no other non-Chinese airport, e.g. Subic Bay, Singapore or

Tokyo Narita can compete.

Therefore, using Zhuhai as the GTP can integrate the other four airports of the EMR into Asia's most competitive air logistics hub which can effectively cover and link the China market with the world market, an enviable geo-political asset that best qualifies it as Asia's GTP. In comparison, other major competitors such as Singapore's Changi Airport, Japan's Narita and Osaka airports, South Korea's Incheon Airport and Thailand's Bangkok Airport are all off the most cost-effective geographic center in the Asian-Pacific Region, and are constrained by large passenger volumes and inadequate airport space for a major push in air cargo development to become Asia's future air logistics hub in the form of a GTP (Fig. 3). Zhuhai's GTP role, in other words, depends on, as well as has to be enhanced by cooperation with the other airports in A5.

With China's longest runway (4000m) at sea level, a large airport site (11km²) and plenty of formed land around it (about 200km²) (Fig. 5), Zhuhai Airport may be quickly and cost-effectively developed, through a number of stages, into Asia's first and largest GTP with the following functions: 1) Asia's air-express hub, handling mainly transshipment of air express cargo for countries within Asia, and for transshipment between Asia and the rest of the world; 2) Asia's air logistics hub for MNCs that sell goods to the Asia market; 3) Asia's e-commerce fulfillment base; 4) Asia's JIT assembling base for high-tech, high value-added products such as consumer electronics (e.g. PC machine) and IT (e.g. mobile phone) products.

Table 3 International flights per week from China's major airport

City	Flights per week	Some cities of destination and frequency(flights per week)
Beijing	361	Seoul(25), Singapore(23), Osaka(24), Los Angeles(21), San Francisco(17), Frankfurt(15), Tokyo(14), Bangkok(14), Sydney(13), New York(10), Paris(9), Vancouver(9), London(8), Moscow(8)
Shanghai	290	Osaka(46), Los Angeles(23), Tokyo(22), San Francisco(17), Singapore(16), Seoul(14), Sydney(14), New York(11), Nagoya(11), Fukuoka(11), Frankfurt(10), Bangkok(10), Paris(8)
Guangzhou	73	Kuala Lumpur(12), Singapore(10), Bangkok(8), Jakarta(6), Osaka(5), Ho Chi Minh City(5), Los Angeles(4), Amsterdam(3)
Dalian	40	Osaka(14), Fukuoka(8), Tokyo(7), Seoul(4)
Qingdao	40	Osaka(19), Seoul(14), Singapore(9), Macao(2)
Xiamen	34	Macao(14), Singapore(9), Manila(8), Kuala Lumpur(2)
Shenyang	28	Seoul(11), Irkutsk(8), Osaka(2), Moscow(2)
Kunming	28	Bangkok(13), Singapore(6), Rangoon(2)
Tianjin	23	Seoul(6), Novosibirsk(5), Nagoya(3), Irkutsk(3)
Xi'an	22	Nagoya(9), Hiroshima(4), Fukuoka(3), Niigata(2)

In general, activities and products that mainly target non-China market that require large space and a bonded environment will likely concentrate within the GTP (Fig.6). International multi-city and multi-airport distribution and collection will be channelled through the Hong Kong and Macao airports. These two SARs will also provide most of the supporting producer services. The new Guangzhou (Fadu) Airport and Shenzhen Airport will provide multi-city and multi-airport distribution and collection functions within China for the GTP. Most of JIT assembly and warehousing and related value-added activities for China's domestic market may best be provided in the new Fadu Airport. Detailed co-

ordination and planning for the division functions of these five airports will be required for the successful launching and operation of the GTP.

Besides, the Chinese government has to provide the following minimum conditions for the GTP:

- (1) Air flight rights for international air cargo integrators, in particular to major operators such as Fedex, UPS, TNT, DHL etc., to fly in and out of Zhuhai.
- (2) Realign Zhuhai Airport as a GTP, i.e. with priority given to international cargo flights and related activities while keeping passenger business (domestic) to a minimum.
- (3) Bonded and Free Trade Zone status to all cargo

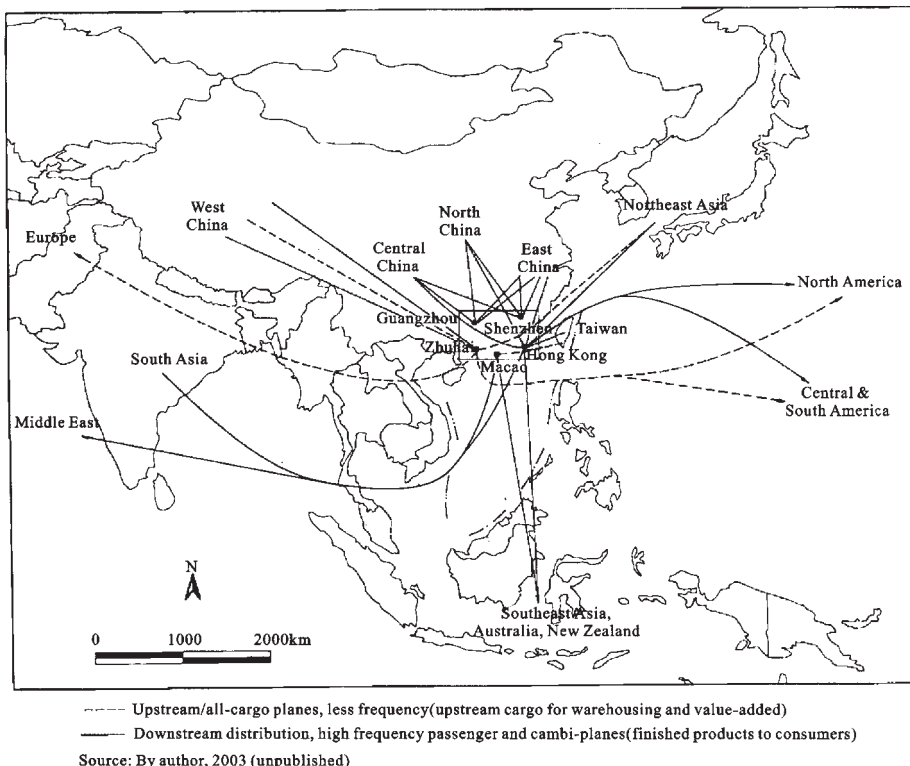


Fig. 6 Proposed division of airflight in South China

and activities related to international transshipment.

(4) Bonded arrangement for speedboat links between the Zhuhai Airport and the Macao and Hong Kong airports.

7 CONCLUSION: GTP AT ZHUHAI—A NEW EMR COOPERATIVE APPROACH

Creating the GTP at Zhuhai will not be possible without the understanding, approval and close cooperation of the Chinese government, the two SAR governments and local authorities of Guangdong. All of them have to be aware that the GTP is not just a local facility. It is in fact a national and even continental competitiveness. Its creation and successful operation will put the Chinese national economy onto a new historical height, i.e. it will dominate Asia's e-commerce, JIT assembling, air express and air logistics. This will obviously directly benefit the PRD, Hong Kong and Macao as they contribute to the success of the GTP through their respective comparative advantages of geography, traditional factor edges as well as the varying and accommodative milieu for business under 'One country, two systems'.

The implied cooperation in feasibility study, planning and construction of related infrastructure, the fabrication and implementation of relevant policies and marketing mean a higher and qualitatively different type of cooperation between all levels of government as previously indicated. In such a context, a new perception of the Hong Kong-PRD relationship in the continual evolution of the EMR, and the appropriate positioning of the EMR in the overall Chinese economy will be needed. Institution building involving all these official actors will also have to be in place soon in order that the new cooperative approach may materialize. At the initiation of the Hong Kong Airport Authority, the authorities of A5 have started regular meetings since 2001 for coordinating their services and growth strategy. One important result is the co-commissioning by Hong Kong Airport Authority and Zhuhai Airport Authority including a consultant study on air-cargo joint venture between the two airports in 2002 (Hong Kong Airport Authority, 2003). It is reasonable to anticipate that Asia's first GTP may become realistic within the first decade of the new century.

Finally, to summarize, this paper briefly examined the concept of the GTP in the light of the development and significance of the air cargo industry in Asian-Pacific Region. In particular, it focused on the situation of China's air cargo industry and the need for it to develop a GTP in the next round of economic globaliza-

tion. South China is seen as the best location for such an infrastructure. The conversion of Zhuhai Airport into a GTP will serve such a purpose. It is hoped that the paper will arouse attention to the role of airport infrastructure as a critical logistics platform in the New Economy and that there will be further studies to deepen our understanding on the topic of air cargo industry and the concept of the GTP.

REFERENCES

- Boeing Commercial Airplane Group, 1998. *Current Market Outlook 1998/1999* [M]. Seattle: Boeing Commercial Airplane Group.
- China Civil Aviation Authority, 1991–2003. *China Statistics on Civil Aviation* [M]. Beijing: China Civil Aviation Authority. (in Chinese)
- Hong Kong Airport Authority, 2003 [E]. <http://www.hongkongairport.com>
- Hong Kong SAR Government, 2003 [E]. <http://www.info.gov.hk>
- KASARDA J D, 1998. The global transpark: infrastructure for industrial advantages [J]. *Urban Land*, April.
- KASARDA J D and SIT V F S, 2000. Zhuhai Global TransPark: rationale, feasibility & development guidelines [R]. Hong Kong: Great Momentum, May.
- Macro Economic Research Institute, 2001. Hong Kong-Mainland cooperation: joint development of logistics industry [R]. Beijing: State Planning Commission of China, December. (in Chinese)
- National Bureau of Statistics of China, 1998. *China Statistical Yearbook* [M]. Beijing: China Statistics Press. (in Chinese)
- RIMMER P, 1998. Transport and telecommunication among world cities [A]. In: LO F and YEUNG Y (eds.) *Globalization and the World of Large Cities* [C]. Tokyo: UNU, 433–470.
- SEALY K, 1966. *The Geography of Air Transport* [M]. London: Hutchison U L.
- SIT V F S, 1991. Hong Kong Guangdong Integration [A]. In: KWOK R Y and SO A Y (eds.) *Historical Changes in Hong Kong and South China: Socio-cultural Integration toward 1997* [C]. Hawaii: School of Hawaiian, Asia & Pacific Studies, 53–57.
- SIT V F S, 2001. Increasing Globalization and the Growth of Hong Kong Extended Metropolitan Region [A]. In: LO Fuchen and MARCOTTULLIO P (eds.) *Globalization and the Sustainability of Cities in the Asia-Pacific Region* [C]. Tokyo: UNU, 199–238.
- SIT V F S, 2002. Proposal to establish Asia's Global TransPark [N]. *Ta Kung Pao* (Hong Kong Chinese Daily), 2002-11-08. (in Chinese)
- TIAN S, 2003. The four special economic zones may enjoy an open sky [N]. *Ta Kung Pao* (Hong Kong Chinese Daily), 2003-05-23. (in Chinese)
- TSANG H, 2002. Constructing a Global TransPark [A]. In: Development Research Center, Guangdong Peoples' Government (ed.) *Modern Logistics and Guangdong's Economy* [C]. Guangzhou: Guangdong People's Government, 152–158. (in Chinese)