

THE EVOLUTION OF THE TRANSPORT AND LOGISTICS SECTOR IN DUBAI¹

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ABSTRACT

Over the past decade the emirate of Dubai has emerged as a leading transport and logistics centre serving not only the Middle East and North Africa (MENA) region, but also Russia, Europe, Asia and the Far East. This has been driven by concerted and far-sighted government initiatives which since the mid-1970s have sought to diversify an economy underpinned by oil revenues, but with an otherwise limited domestic resource base. With little arable land and a very small and un-skilled population, Dubai was a pearling port and regional entrepot based around shipping until the discovery of oil in the 1960s. A succession of formal government plans has introduced incentives and inducements aimed at encouraging Free Zone based companies to set-up operations in the emirate with the aim of fast-tracking the establishment of a modern, service-based economy. Initially the planning focus was on establishing the finance, tourism and property sectors as well as on significant expansion and upgrading of traditional trading activities. More recently the emphasis has broadened to incorporate more technology-intensive service industries. The phased development of Dubai's transport and logistics sector over the past several decades has culminated in the establishment of a major regional multi-modal commercial and transport hub, a so-called 'trastropolis'. Although a work-in-progress, several stages of this long-term project are already operational and construction remains ongoing. The future success of this government project is unclear. In the public sector, there exist major challenges, some reflective of the need to efficiently manage and coordinate such a huge undertaking while others stem from the uncertainties of a competitive global market-place. For individual companies and industries (public and private) looking to participate and commit to the venture, a number of issues need to be addressed in the formulation of business strategies.

I. INDUSTRY BACKGROUND

Transport and logistics comprise a large part of the global economy and in 2006 accounted for an estimated total revenue worldwide of USD 3.4 trillion. (DataMonitor, 2007). The sector broadly encapsulates three types of activities:

(1) transport service provider, which include air freight, express delivery services, marine transport and road and rail transport; in 2006 this industry accounted for almost two-thirds of of the sector's global revenues (Standard and Poors, 2006);

(2) transport infrastructure operators (comprising around one third of revenues) which includes airports, marine ports, highways and railways; and

(3) logistical services, comprising freight forwarders, freight brokers and third-party logistics (3PL) providers.¹

In recent years the demand for these complementary services has grown in line with the expansion in global trade which is linked to an increasing outsourcing of manufacturing support activities. Businesses, institutions and individuals now face a growing dependence on sophisticated transport and logistics systems to help operate uninterrupted supply chains. Optimal supply chain operation as a necessary condition for competitive advantage of firms in today's global market-place depends on a number of factors. These include the need for a modern transport infrastructure, supporting information, legal and financial frameworks and ease of cross-border trade (including lower charges and more streamlined procedures). Competitive carriers and logistics providers along with stable and

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transparent government support are necessary to enable the movement of goods from a growing number of source locations to meet market demand.

One particular feature of the international reach of the sector has been consolidation and cooperation across all its component activities, reflecting a demand for integrated global solutions. This has seen some operators (public and private) vertically integrating across various services in the supply chain in order to achieve economies of scale and scope (Waters, 2007). A traditional strategy by national and regional governments has been to approach transport infrastructure investment on a mode-specific basis. As a result many regions are characterised by systems that remain congested and unreliable. Resulting inefficiencies have led to loss of export competitiveness, reduced inward investment and rising costs for imported final goods and intermediate goods. Inter or multimodal transport systems are now emerging in response to the need for speed to market combined with integrated supply chain management and agile manufacturing and business practices (Rondinelli and Berry, 2000). This involves, *inter alia*, transporting passengers and freight on two or more different modes in such a way that all parts of the process are reliably and efficiently connected and coordinated. New technologies and innovation and information planning have assisted in this response to the ongoing evolution of global production networks.

To facilitate fast, low-cost global distribution, a successful regional logistic hub increasingly requires cargo (people and goods) to be moved from one transport mode to another quickly and efficiently. Such an approach facilitates point to point delivery, resulting in lower transit times, reduced packing costs, improved product quality, increased reliability and the development of new markets. Multi-modal transport has helped sea ports evolve from stand-alone break-bulk and terminal focus to an expanded role as fundamental links in a global distribution chain. This involves not only carriers, but the activities of value-adding freight logistics providers and manufacturing companies (including such areas as light assembly, packaging, labelling, distribution and inventory management). Increasingly critical are those 3PL companies who design, implement and manage a client's supply chain logistics needs, adding value based on information and knowledge rather than merely providing an undifferentiated service at the lowest cost. As a result successful execution of a coordinated, seamless, flexible and speedy movement of goods across two or more modes of transportation increasingly relies on timely and accurate exchange of information. Cooperation and coordination between all players, public and private, carriers and service providers, is an integral part of this endeavour.

Hall and Robbins (2007) identify several strategic objectives for transport service and transport infrastructure service (TSIS) providers seeking to successfully become embedded in global supply chains. Businesses need to actually insert themselves into supply chains in the first place. A regional government can serve as a catalyst to attract firms to a particular location and create a critical mass of transport and logistics related activities (see below). Once established market participants may look to integrate their activities (vertically or horizontally) to achieve efficiencies; this latter objective can again be facilitated by support from policy makers through the provision of intermodal transfer opportunities and the establishment of industry clusters. This can enable firms to achieve what Greis and Kasarda (1997) term "economies of conjunction" whereby multiple events or transactions can be conducted at the same time and place. Integration in turn can enable the region and participating firms to achieve a level of industry dominance or market power through scale and scope of operations or through niche marketing.

As observed by Jacobs and Hall (2007) in a study of Dubai ports, global production networks do not simply locate themselves in a particular location. Moreover, private firms are not necessarily focussed primarily on issues related to regional development (which is likely to be a key objective of government and public sector participants). To identify dimensions that support the objectives of regional development and serve the interests of the various TSIS providers it is instructive to look at the role of government in a specific location. This may involve government as an active player in the TSIS sector as well as serving a role as regulator and manager of overall activities. The interaction between businesses and government with respect to physical resources, institutional arrangements and governance can be considered to define the environment which can encourage footloose, global operating firms to become territorially embedded and also allow for locally based firms to link with global production networks (Ball, 1998; Jacobs, 2007). The creation of such a supportive environment has underpinned Dubai's successful supply chain strategies in the context of a broader regional development policy framework.

The following section of this paper provides a brief outline of Dubai and its role in the global transport and logistics industry. A more detailed look at the evolution of Dubai as a multi-modal trans-shipment centre is then provided followed by a discussion and assessment of an emerging Dubai 'transtropolis'.

II. DUBAI'S RECENT EXPERIENCE

Situated on major trade lanes, Dubai is one of the seven emirates that constitute the United Arab Emirates (UAE) and benefits from its geo-strategic position within the middle of the Middle East and North Africa (MENA) region and half way between Asia and Europe, a catchment area of over 2 billion people² (**Figure-1**). It also lies close to Russia and countries of the Commonwealth of Independent States (CIS). Europe, the Indian subcontinent and Africa are all within three to five hour flying distance from Dubai.

The Dubai economy has been performing strongly for well over a decade. For the period 2000-2008 the economy grew at an annual rate of around 10 per cent. While the global financial crisis did slow the economy in 2009, conditions have improved in line with developments internationally (IMF, 2010). While oil revenues are important, and will remain so, for financing government budgets and development projects, the economy is very diversified as a result of conscious government policies over several decades (Sampller and Eigner, 2003). Although oil provided for over 70 per cent of non tax revenues in 2009, the non-oil sector contributed around 95 per cent to total GDP (Hvidt, 2009). This latter figure compares to a figure of 90 per cent in 2000 and 46 per cent in 1975.³ This economic restructuring has been driven by the service sector which in 2005 accounted for about 74 per cent of output with the transport, storage and communication (TSC) sector contributing 13.3 per cent. The TSC also accounted for 8 per cent of total employment according to official estimates (<http://www.dsc.gov.ae/en/pages/economicdevelopmentstatistics.aspx>:<http://www.dubaied.gov.ae/English/ecosrch/EconStudies/MgeContentsDocLib/DSP%202015%20En.pdf>).⁴

The UAE has one of the most unique demographic distributions in the world. Emirati nationals represent around 20 per cent of the population of around 5.6 million. Although census figures are problematic for the whole country, Dubai had an estimated population of around 1.2 million, with only 15 per cent nationals (Hvidt, 2009). The UAE's population has been growing rapidly, averaging an annual growth rate of around 8 per cent over the past decade. In Dubai alone, about 99 per cent of the private sector labour force is expatriate comprising unskilled, skilled and professional workers. Economic development in the emirate has become very dependent on being able to attract and maintain a stable and expanding workforce.

More than 60 per cent of the region's imports transit Dubai's borders and in 2008 Dubai was ranked as the third most important global re-export centre in terms of throughput (after Hong Kong and Singapore) and had the world's seventh busiest container terminal. (Table 1; <http://www.dubaiworld.ae/>). In 2009, re-exports were around USD 32 billion compared with direct exports valued at USD 14.5 billion. The logistics market in Dubai, meanwhile, has been growing at an annual rate of around 20 per cent over the past decade, reaching a global market share currently of about 4.5 per cent by 2006 (http://www.dsc.gov.ae/Reports/DSC_SYB_2009_10_4.pdf; Frost and Sullivan, 2010). Revenues in the UAE logistics market reached USD 7 billion in 2010 and expected to be around USD 16 billion by 2020. As discussed below, this rate of expansion has created bottlenecks due to capacity constraints and has led to government efforts to significantly expand the transport and logistics sector.

Figure-1: Map of UAE and the Gulf Region



Supply Chain Strategies

The economic development of Dubai, including its rise as a major transport and logistics hub, has been the result of deliberate planning undertaken by the government aimed at creating a nurturing business environment while at the same time providing for targeted, sector specific policies and programs. In the TSC sector in particular, the government, through various of its commercial arms, has been a key player in providing both hard and soft infrastructure as well as participating directly as a significant service provider.

As observed earlier, it is the interaction between firms and government with respect to physical resources, institutional arrangements and (related) governance issues that supports the embedded nature of global production networks (through its component parts) in a particular location and facilitate the strategies for players in the TSC sector of insertion, integration and dominance (Jacobs and Hall, 2007) In the case of Dubai government provision of slick marketing (‘Dubai Inc’), a modern communication infrastructure along with the provision of land and air and sea-port facilities are examples of the first of these conditions. Institutional arrangements that complement this have included land-use leasing and planning provisions through the use of free zones which encompass liberal trade policies, financial and taxation incentives, labour market controls and strategic costing structures for participants (Mitra and Thorpe, 2010). The corporate-style leadership which characterises the approach of the Dubai government has been able to make decisions quickly in order to mobilise and direct resource allocation, serving variously as a regulator, market participant or manager within the sector. The discussion below elucidates these interactions and details how the Dubai government has sought to build a dominant global TSC sector.

Table-1: Container Ports

| Rank 2008 (2007) | Port | Country | TEUs* |
|------------------|-----------|-----------|------------|
| 1(1) | Singapore | Singapore | 29,918,200 |
| 2(2) | Shanghai | China | 27,980,000 |
| 3(3) | Hong Kong | China | 24,248,000 |
| 4(4) | Shenzhen | China | 21,413,888 |

| | | | |
|--------|-----------|-------------|------------|
| 5(5) | Busan | S.Korea | 13,425,000 |
| 6(7) | Dubai | UAE | 11,827,299 |
| 7(11) | Ningbo | China | 11,226,000 |
| 8(12) | Guangzhou | China | 11,001,300 |
| 9(6) | Rotterdam | Netherlands | 10,800,000 |
| 10(10) | Qindao | China | 10,320,000 |
| 11(9) | Hamburg | Germany | 9,700,000 |

* Twenty-foot equivalent units (a measure of container capacity)

Source: Container Throughput Worldwide, Port of Hamburg,

http://www.hafen-hamburg.de/en/index.php?option=com_content&task=view&id=58&Itemid=91.

Following the discovery of oil in the UAE in 1966, the export revenues which were generated enabled the government of Dubai to invest heavily on infrastructure, developing roads bridges and ports.⁵ This approach was visionary in its day and was aimed at underpinning the economic sustainability of the emirate over the long-term (Baluch, 2005; Sampler and Eigner, 2003). An early initiative was the expansion of the historical sea port of Port Rashid and establishment in 1976 of a new container port at Jebel Ali. The resultant expansion in shipping and transshipment activities lead to growth in shipbuilding and repair and maintenance services. The new port was the largest man-made harbour in the world at that time and today is the largest port in the Middle East. (http://www.economist.com/cities/findstory.cmf?CITY_ID=DUB&FOLDER=Facts-History). The Jebel Ali Free Zone (JAFZ) adjacent to the port was established in the mid 1980s specifically to attract transport and logistics service providers (http://www.jafza.co.ae/jafza/content/sectin1/s1_2.aspx). It permits 100 per cent foreign ownership for firms which locate within the zone and provides favourable supporting infrastructure, a favourable tax regime and streamlined bureaucratic procedures.⁶

Emirates Airlines, the government owned and managed national carrier which was set up in 1985 has emerged as one of the five most profitable international airlines and was 17th largest in terms of cargo tonnage in 2005 (<http://wcm.dubaiholdings.com/wps/wcm/resources/file/eb34570850e9eab/>). Success has been in no small part due to government financial backing with aggressive global marketing and the purchase of modern fleets. A landmark decision in the mid-1970s was to exempt sea-air transit cargo through Dubai International Airport (DBX) which was established in 1960 from any duties or charges. This was a catalyst in the evolution of the city as a multi-modal transport hub for local and regional freight operators. In 1978 around 170 tons of cargo was moving via a sea-air route through Dubai from the Far East and the Indian subcontinent to Europe and North America. This had risen to 20,000 tons by the end of the 1980s and is currently around 100,000 tons. (<http://www.globalsecurity.org/military/facility/jebel-ali.htm>). Currently there are over 180 airlines and around 60 shipping lines operating through the emirate (Gulf News, 2009).

Dubai's competitive position as a regional hub was further underpinned by the success of the Dubai Airport Free Zone (DAFZ), comprising the original airport and an adjacent logistics free zone for handling all air cargo (Dubai Airport Dubai Cargo Village). This zone, at the northern end of the city is situated 30 kilometres from JAFZ in the south, the two joined by an increasingly congested road network. Middle East air cargo growth has outstripped that in the rest of the world, with air freight in Dubai doubling between 2000 and 2006. In 2010, DBX was ranked third busiest in the world in terms of passengers and cargo throughput. The airport handled 47 million passengers (up 15 per cent on year earlier numbers) while its cargo traffic (at 2.3 million tonnes) represented a 17 per cent increase over 2009 levels. With passenger capacity at 70 million per annum and the capacity limit for cargo at the airport at 2.5 million tonnes the squeeze on existing facilities is evident. (<http://www.dubaiairport.com/DubaiAirports/English/Media+Center/Press+Release/Dubai+International+passenger+traffic+hits+new+heights.htm>). Further, the global aviation business is currently forecast to experience average annual growth of over 5 per cent over the next decade, with the expectation that the transport markets in the United States and Europe are likely to drop market share to emerging markets such as China, India and the Middle East (Aviation Industry Overview, <http://info.shine.com//article/Aviation/Aviation-industry-overview/4235/cid140.aspx>, June 7th 2010). A very positive medium term outlook for airlines in the Gulf region generally and for Emirates Airlines in particular, meanwhile, have been highlighted in a recent industry study (<http://www.frost.com/prod/servlet/press-release.pag?docid=185563027>, November 24th 2009).

To be competitive, a transport and logistics hub must be able to generate sufficient throughput to sustain efficient inter-mode flows. As noted, Dubai has experienced very strong growth in the volume of freight transhipped from sea to air as a result of significant investments in capacity and integration of existing facilities (Majdalani et al,

2008). With good accessibility by air, sea and land Dubai is well placed due to its geographic location with connectivity opportunities beyond the significant Asia-Europe trade to the wider MENA region, Pakistan, Russia and the CIS countries.⁷ There is also a strong local (as well as regional) economy which will require an expanded logistics and distribution capability to handle rising import demand. Notwithstanding the advantages that Dubai has, there does exist real opportunity for regional competitors as well. To what extent this market could profitably sustain a number of players longer term is difficult to accurately predict. The strategic focus on increasing high quality capacity and the integration of air transport into a wider multi-modal transport and logistics hub has to date set Dubai apart from other regional competitors around the world. It might be added that the sheer scale and scope of planning and construction currently under way (as outlined below), is also unique.

To sustain a competitive advantage as a global hub requires not just a strategic geographic location, but the availability of resources to fund the required large investments and the acumen to build and manage the infrastructure for a world quality operation. Governments need to be involved and must be able to provide a transparent and regulatory environment that will foster business. Strong public sector leadership in terms of national carriers and logistic infrastructure support is an integral part of this mix. A successful hub will need high capacity and high utilisation to attract major global players.

Dubai's success meant that the potential for continuing growth in cargo handling and value-added logistics services at existing facilities had become severely constrained. A lack of space for expansion as the city physically expanded around existing facilities, particularly DAFZ which had originally been on the city outskirts, was seen as a brake on development. As determined by the World Bank's Logistics Performance Index, the UAE ranked 24 in 2010 down from 20 in 2007 (www.worldbank.org/etools/tradesurvey/mod1b.asp). Singapore was number 2 in 2010, behind Germany, and Hong Kong was at 13 while across the Gulf, among competitor countries, Bahrain ranked 28, Saudi Arabia 32 and Oman 40.⁸

III. EXPANSION MODE: TRANSPORT AND LOGISTICS IN DUBAI

From Aerotropolis to 'Transtropolis'

The term 'aerotropolis' has been popularised by American academic Dr John Kasarda (Donahue, 2010). The concept captures the way in which the global growth in air cargo and passenger traffic has led to the increased importance of airports and their attraction as centres for complementary revenue generating commercial and industrial development. They are considered to have significant non-aeronautical commercial facilities and services. Potentially these might include such things as industrial parks, office complexes, tourism and retail facilities and residential precincts, linked together to provide fast and efficient connectivity between the different business clusters as well as with the rest of the world. Moore-Wilton (2007) has sought to identify some of the key features underlying the most successful aerotropolis to date. These have included the existence of an economically important hub airport which serves as a base for a national carrier and which is effectively controlled and managed by the relevant government. It is further suggested that success has been a result of explicit strategies aimed at developing the concept.

Several areas in Europe, the Middle East and Asia have been identified as having led the way in the evolution of the aerotropolis concept while the United States is seen as lagging the rest of the world (Barnet, 2010; Moore-Wilton, 2007). The city states of Dubai, Singapore and Hong Kong are well developed examples, with economically important hub airports, strong national carriers and government commitment to airport development as part of an overall national strategy. Guangzhou (China), South Korea, London, Frankfurt, Paris and Amsterdam are also examples of globally significant aviation hubs. European airports, however, tend to be bound somewhat by environmental and land constraints that may limit the ability to continue expand (already strained) capacity. Unlike Asia and the Middle East, the development of large airports in Europe has been driven increasingly by the private sector.

Ringbeck and Majdalani (2008) suggest that the success of airport as hubs depends on the quality of operations, strategic traffic positioning and the political environment. With regard to the first of these factors, important elements that are identified include a potential for future growth and capacity increases, minimum delays and low connecting times as well as an effective balancing of the service delivery capability with supporting infrastructure (to avoid bottlenecks). Traffic positioning refers to the effective size of an accessible regional hinterland, strategic geographical positioning within a global network and the competitiveness of the local transport service providers. The extent of regulation and ownership restrictions and general political stability and government support are also seen as issues influencing success.

The focus in the aerotropolis literature tends to be on air cargo, which has been growing significantly faster than global trade over the past several decades, moving through aviation hubs. However it needs to be noted that the vast bulk of trade still goes by sea and for some areas and products this remains the major, if not only, shipment option. In this discussion the notion of aerotropolis is broadened to reflect a multi-modal hub, incorporating sea and land links (as well as air) and related logistics and other commercial support services. The term 'transtropolis' is used to reflect this development.

With the move of shippers to employ larger and larger vessels to move growing volumes of sea freight there has been a shift towards a hub-and-spoke approach to logistics (Majdalani et al, 2008). Under this arrangement, freight destined for different destinations is transported to a central hub where it can be unloaded and newly grouped and transformed as required for moving on to final destinations (along the "spokes"). This final shipping could be done by air, sea or land transport modes. Moreover, as product cycles speed up and companies seek more control over stock management, a multi-modal approach to operating a logistics and transport hub permits shippers to mix the benefit from the more cost-effective use of high volume sea freight with the speedier and more flexible delivery by air or road.

The Dubai Expansion

The fact that Asia and Europe are well served by many sea and airports for entry and exit lends itself to a hub-and-spoke approach in facilitating their bilateral trade flows with the Gulf region uniquely placed to play a leading role in this development. Historically the region has been a fuel stop-over point on long-haul flights between Europe and Asia and this traffic has increased with the growth in air freight resulting from the significant rise in trade volumes. Moreover, the Gulf region and the wider MENA region constitutes one of the world's fastest growing areas. This translates into high volumes of incoming freight of imported consumer and producer goods which can be distributed by an excellent existing regional road system as well as by sea or air. In turn, this also creates transport capacity for back-loading. Dubai has been particularly well-placed to position itself in a dominant leadership role as a multi-modal transport and logistics hub.

An important part of this strategy was the the creation of Dubai World Central (DWC) (Gulf News, 2008). At an estimated cost of USD 33 billion, the construction of this mega-complex is currently well under way; it is intended to be fully completed by 2050 and will comprise a 140 square kilometer precinct (twice the size of Hong Kong), an urban aviation community centered on the world's largest airport (the Al Maktoum International Airport) and contiguous with the Jebel Ali port and free zone (Organization Design Work Stream, Dubai, 2006). This is a massive undertaking in terms of the scale and scope of operation and the resources required by government.

The new airport began operation in July 2010, initially for cargo operations, with passenger traffic being phased in by mid-2010. Planned capacity is 120 million passengers and 12 million tonnes of cargo annually. The DWC site will consist of an integrated transport and logistics hub operating within a planned residential and commercial complex and incorporating all needed transport modes, logistics and value-added services, including manufacturing and assembly, in a single bonded free zone environment. This Dubai 'transtropolis' will facilitate direct air transport of cargo which enters via the Jebel Ali port to major destinations in Europe within 4 hours ensuring point to point delivery and significantly reducing road transport within Europe. Road transport operations will also be a focus.

When fully operational DWC will comprise six clustered zones with estimated employment opportunity for 750,000 people. The following facilities will be provided within the complex:

- Five parallel runways
- Three passenger terminals including two luxury facilities
- Multiple concourses
- Sixteen cargo terminals
- Executive and Royal jet centres
- Hotels and shopping malls, office and residential areas
- Support and maintenance facility for aircrafts
- A high speed express rail system linking with the city of Dubai proper.

One of the elements within DWC which will play a pivotal role in hub operations is Dubai Logistics City (DLC), a fully integrated logistics platform with multi-modal shipment handling, multi-client warehousing and dedicated in-house logistics all in a single custom bonded free zone. ([http://www.menafn.com / qn_news_story_s.asp?StoryId = 1093296617](http://www.menafn.com/qn_news_story_s.asp?StoryId=1093296617)). The focus is on freight forwarding and contract logistics services and will include warehousing, packaging, re-packaging, assembly, inspection, quality control, labeling, consolidation and shipping of consignments. A labor village to accommodate 40,000 staff is also planned. Part of a "logistics

corridor” linking sea, land and air transport, DLC will cover 25 square kilometres and is designed to ultimately handle 12 million tonnes of air cargo annually in up to 22 air cargo terminals. The first phase is currently complete and is capable of handling 700,000 tons per year. Shipment by road from a trucking centre inside DLC to other member states in the Gulf Cooperation Council (GCC) will have competitive advantage over entry via other ports in the region because there are not the geographical constraints of mountainous areas that exist elsewhere and a world-class road system is already established.⁹ Moreover, a GCC agreement on land borders is in place and will allow freight to move across the region in less than 72 hours (Figure 1). The relatively small geographical area of Dubai now encompasses two international airports and two major sea ports all within ninety three kilometres of each other. This has facilitated the cluster development of the transport and logistics sector on a huge scale by world standards.

The DWC enterprise (including DLC) is managed by the government owned and operated entity Dubai Aviation City Corporation (DACC) which also is responsible for . The ports in Dubai, meanwhile, are under the overall management control of DP World, with the Jebel Ali Free Zone Authority (JAFZA) serving as the direct regulatory authority. Another government run company, Dubai World in turn controls DP World. This company, in particular, has experienced financial pressures stemming from the global financial crisis of 2008-2009.

Both Dubai World and DACC are state owned holding companies that together embrace a suite of diverse enterprises which include, among others, ports, terminals, transport infrastructure and financial institutions. In the face of commercial pressures to operate successfully, these public conglomerates often complement each other, but at other times are seen as competitors. They often compete with each other for clients and related business, especially among logistics service providers, but a crucial element is the relationship between DLC and the adjoining port at JAFZ, the two zones critical for smooth operation along the logistics corridor linking the sea port with air and road transport carriers.

IV. THE RECIPE FOR SUCCESS

What have been the features of Dubai’s approach to its development as a transport hub and what does the future hold? The central feature of the economic model in Dubai has centred on the business environment that has been created as part of a wider regional development policy framework. As noted above, this has related to the provision of supporting physical resources, institutional arrangements and government control and planning. Over the past several decades the national strategic thrust has been charted in a succession of clearly defined economic plans which have identified priority areas to be championed (Mitra and Thorpe, 2010). The creation of numerous industry specific free zones has been the cornerstone of this approach. These constitute clearly defined geographical areas, literally carved out of the desert as the city has expanded. JAFZ, DWC and DAFZ are examples of this approach in the transport and logistics area. A liberal regulatory environment has been clearly directed at foreign firms and attracting an expatriate labour force. The lack of domestic resources has meant that more traditional development strategies were not an option; instead Dubai has relied on importing skilled and un-skilled labour on a large scale, seeking to create an economic infrastructure to support specifically targeted industry sectors under government management.

Diversification of the economy has been a long term development plan wherein Phases 1 through 3 (see below) saw the creation of high technology research and knowledge intensive industries while migrating natural resource based industries like transport and logistics to a global scale

The development plans have been as follows:

1. Phase-I: Industry focus on Trade, Transportation, Logistics and Tourism (all through 1980s)
2. Phase-II: Industry focus on Technology, Services, Finance, Media and IT (1990s through to 2010)
3. Phase-III: Industry focus on R&D, Education, Bio-technology, Pharmaceuticals, Wireless and Nanotechnology (2005- through to 2015)

In the 1980s the industries that were encouraged reflected Dubai’s natural advantages based on its geographic position in the region, its strategic location, a stable political environment and a favourable climate.

To achieve a truly global scale of operation, Dubai’s TSC sector has endeavoured to embed itself as a major player in global supply chains. The approach as fashioned by the Dubai government has sought to go beyond the aerotropolis model to create a multi-modal state of the art transportation node surrounded by integrated commercial and residential centres. The result has been the linking of a sea port and various commercial free zones with a newly created airport hub using a six lane custom bound road linking the two. Combined with a road

transport hub connected to the Gulf region, this constitutes the 'transtropolis' as defined in this paper. While an aerotropolis is seen to have the benefit of faster, close to market transportation involving less packaging, this mode has the disadvantages of lower bulk/ weight of product handled when compared to sea port which in turn has slower transfer but at lower costs (per tonne/volume).

In a globalised market where products increasingly need local customization and quick turnaround, at the same time being price sensitive, a mix of sea and air transportation and handling can help reduce average costs and delivery times. Therefore the 'transtropolis' can provide competitive advantages beyond simply scale of operation. The advantage of such an approach over a conventional aerotropolis can be considered to be in providing necessary speed to market and customisation with respect to both bulk/low value as well as high value items, providing greater flexibility. Dubai is positioned to corner sustainable competitive advantage from the unique approach it has adopted.

V. LOOKING FORWARD

Although Dubai has been successful to date in growing its air, sea and road transport networks it is committed to a resource intensive expansion path, massive even in global terms, for the transport and logistics sector. Ambitious plans currently in train seek to establish the emirate as a world leader, if not the world's largest industry player. Considerable challenges remain.¹⁰

Current cost advantage for Dubai stems from non-unionised cheap expatriate labour, subsidised energy prices, low taxes and government support for economic and specialised logistics infrastructure and modern air transport services. There has also been an element of first-mover advantage with respect to regional competitors. However, availability of cheap labour, incoordinated competition and a limited domestic market may create challenges for the sustainability of such a large 'transtropolis'.

Several major challenges can be identified with such a large undertaking. These relate to the scale and scope of the project and related inefficiencies which include management issues and competitive pressures in the market place. The sheer size of the 'transtropolis' creates particular issues. As outlined above, continued economic expansion necessitates access to a pool of skilled labour from outside the emirate. Growing uncoordinated competition exists for passengers and freight already within the Gulf region, with expansions in airports and sea ports under way in neighbouring Abu Dhabi in the UAE, Bahrain and Jeddah in Saudi Arabia. This will play into final market share being cannibalised with overlapping catchment areas as well as into competing demand for labour and skills.

As argued by Ringbeck and Majdalani (2008), the planned increase in passenger carrying capacity for the Middle East as a whole could lead to overcapacity in the region. By 2012, for example, it is expected that Abu Dhabi will have increased its annual passenger handling capability to 50 million and Qatar to 20 million by 2012 at their respective international airports. This market is a critical one for the overall success of Dubai's aviation and related industries.

The commitment of resources by the government of Dubai in order to complete the targetted objective is a long term proposition and will be subject to the uncertainties of global economic and political conditions. The region has been facing extreme political uncertainties in many countries since 2011. A buoyant global economy is needed to underpin cargo flows, stable oil prices are a requisite for government finances and financial planning, while political stability is also crucial. Other sectors of the economy in Dubai including property, tourism, construction, finance, health and education are also vye for government financial backing and expatriate labour in competition with the 'transtropolis' in Dubai.

As highlighted by the structure of the 'transtropolis' itself spanning multiple free zones, these areas need to act together cooperatively and are managed by different government controlled entities, driven as they are currently by their own commercial interests and at times having conflicting rules and regulations. Adequate operational and financial transparency is also restricted in such an environment. This contrasts with Singapore where there exists a central regulatory body for all zones in that country. Bureaucratic paper work, for example, has hindered quick and efficient movement of goods between zones, while the tying of work visas for expatriates to particular zones has meant that labour mobility and skill transfer across free zone borders is severely restricted. More recently, efforts by JAFZ to expand its logistics service business saw the area in direct competition with DLC for clients. To allow for fast and efficient transfer between air, sea and land transport operations (a much touted competitive advantage for the new "Airtropolis") and to avoid duplication of support services, mechanisms for collaboration and joint policy development by the managers of the zones are needed. Currently many stakeholders involved in logistics, including companies, industry associations and business groups, operate in both JAFZ and DLC, indicative of the fragmentation that has occurred.

Given the level of government commitment to Dubai's 'transtropolis', the problem of overcapacity in an overly competitive market will not be resolved by market forces, at least for some time, and not without significant resource waste. The potential competitive pressure from India and China is also problematic. While Dubai currently has a competitive advantage, competitor responses elsewhere will be important in shaping the emirate's medium to longer term outlook notwithstanding developments in the global economy generally and the policies and management expertise of the Dubai government.

REFERENCES

Arab News, Dubai Unveils New Strategic Plan, <http://www.arabnews.com/?page=6§ion=0&article=91743&d=4&m=2&y=2007> American Association of Port Authorities (AAPA) World Port Rankings 2004, <http://www.aapa-ports.org/files/World%5FPORT%5FFrankings%5F2004.xls>

Ball, M. (1998) Institutions in British Property Research: A Review. *Urban Studies*, 35, pp 1501-1517.

Baluch, I. (2005) Transport Logistics; Past, Present and Predictions. Winning Books, UAE.

Barnett T P.M., (2010) The New Rules: Globalization, Air Hubs and the City of Tomorrow, 6 Dec 2010 | www.worldpoliticsreview.com

Container Throughput Worldwide, Port of Hamburg, http://www.hafen-hamburg.de/en/index.php?option=com_content&task=view&id=58&Itemid=91;

DataMonitor, (2010) *United Arab Emirates Express Market Overview* <http://www.datamonitor.com/store/Browse/?Ntt=transport+and+logistics&N=355&page=2>

DataMonitor, (2007) *Global Transportation Services* http://www.datamonitor.com/store/Product/global_transportation_services?productid=7160DB22-7A63-4D70-A67F-B664BE7F5B36

Donahue, B. (2010) The Rise of the Aerotropolis, *Business Facilities*, 43, 8, pp 10-18.

Dubai Industrial City Report,

<http://wcm.dubaiholdings.com/wps/wcm/resources/file/eb34570850e9eab/>

Frost and Sullivan (2010) Strategic Analysis of Logistics Market in United Arab Emirates.

Greis, N. And Kasarda, J. (1997) Enterprise logistics in the information era, *California Management Review*, 39, pp 55-78.

Gulf News (2009) Dubai sets its sights on developing economies, *Gulf News*, 30 November, p 5.

Gulf News (2008) UAE free Zones, Special Report, *Gulf News*, 5 February.

Hall, P. And Robbins, G. (2007) Which link, which chain? Inserting Durban into global automotive supply chains, in

J. Wang, D. Olivier, T. Notteboom and B. Slack (eds.), *Inserting port-cities in global supply chains*, Aldershot:

Ashgate.

Hvidt, M. (2009) The Dubai Model: An Outline of Key Development-Process Elements in Dubai, *International Journal of Middle East Studies*, 41, pp 397-418.

<http://www.dubaiworld.ae/>

<http://www.globalsecurity.org/military/facility/jebel-ali.htm>

IMF (2010) <http://www.imf.org/external/pubs/ft/weo/2010/02/pdf/c2.pdf>

Jacobs, W. (2007) Political economy of port competition. Institutional analyses of Rotterdam, Southern California and Dubai. Nijmegen: Academic Press, Europe.

Jacobs, W. and Hall, P. (2007) What conditions supply chain strategies of ports? The case of Dubai, *GeoJournal*, 68, pp 327-342

Organization Design Work Stream, Dubai, 2006, Government of Dubai, DACA, May 31

Majdalani, F., Koegler, U. And Kuge, S, (2008) *Middle East Transport and Logistics at the Crossroads*,

http://www.booz.com/global/home/what_we_think/reports_and_white_papers/ic-display/42794329

Mitra, S. and M. W. Thorpe (2010), Government policy, clusters and the 'Dubai Model', *International Journal of Globalisation and Small Business*, 4, 1, pp 73-91.

Moore-Wilton, M., (2007) Aerotropoli: Airport Cities, paper presented at Capital Alliance 2007, Contemporary

National Capitals: Plan, Promote, Enhance, Maintain. Canberra, Australia, 22 January

Rondinelli, D. And Berry, M. (2000) Multimodal Transportation, Logistics, and the Environment: Manging

Interactions in a Global Economy, *European Management Journal*, 18, 4, pp 398-410.

Ringbeck, J. and Majdalani, F. (2008), Mastering the Challenges of the Middle East Aviation system,

http://www.booz.com/global/home/what_we_think/reports_and_white_papers/ic-display/41901770

Sampler, J. and Eigner, S. (2003), Sand to Silicon: Achieving Rapid Growth, Lessons from Dubai, London: Profile Books.

Standard and Poors, (2006), *Transportation: Commercial, Asia*, Global Industry Surveys.

Waters, D., (Ed) (2007) *Global Logistics: New Directions in Supply Chain Management*. London: Kogan Page.

WTO Trade Policy Review, (2006), Trade Policies by Sector UAE: Transport, WTO;
http://www.wto.org/english/tratop_e/tpr_e/tp263_e.htm).

ENDNOTES

¹ Carriers function as 3PL providers where they assume any of the traditional management roles companies are increasingly outsourcing; these include such services as warehousing, packing and freight-forwarding.

² The member states of the federation are Abu Dhabi, Dubai, Sharjah, Ras Al Khaima, Umm Al Quwain, Fujairah and Ajman.

³ In contrast, for the UAE as a whole, oil revenues accounted for 37 per cent of GDP in 2008 (<http://www.ameinfo.com/220014.html>).

⁴ Other contributions to GDP were 11.7 per cent for the finance sector, 12.3 per cent for manufacturing, 11.2 per cent for construction, 29.7 per cent for retail and 3.5 per cent for tourism (hotels and restaurants).

⁵ Although relatively well served by oil reserves, 90 per cent of oil and gas deposits in the UAE are concentrated in the neighboring emirate of Abu Dhabi and wary of likely rapid depletion at that time, the government in Dubai sought to prepare for the time when oil could not be relied upon. Dubai contributes one quarter of the UAE's GDP while Abu Dhabi contributes over half (WTO Trade Policy Review, 2006).

⁶ JAFZ now covers 100 square kilometres and houses 5000 companies from 120 countries including over 100 from the United States.

⁷ Prior to use of sea-air links via Dubai, moving freight from Asia to Europe was costly and time-consuming and often required transit through North America.

⁸ This measure is based on biennial industry surveys and reflects logistics performance and trade facilitation.

⁹ The GCC is a common market that includes six member states, the UAE, Saudi Arabia, Kuwait, Oman, Qatar and Bahrain.

¹⁰ Threats to the UAE's competitiveness identified in the World Competitiveness Report that saw the UAE's rank slip two place over the past two years to a global ranking of 25 in 2010 (<http://www3.weforum.org>). Singapore ranked number 2 and Hong Kong number 11 in the report. While the UAE scores highly for investment infrastructure and the penetration of new technologies, identified problem areas include transparency and accountability in government and private institutions. Ongoing debt overhang also remains an issue for the public sector. Continued innovation, more sophisticated processes and the provision of new and different goods and services (such as health and education) have also been identified as important drivers of competitive advantage.