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SINEWS OF GROWTH:

GENERATIVE INFRASTRUCTURAL URBANISM IN DUBAI

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SUMMARY

As Dubai embarks on the Dubai World Central (DWC) project in parallel with its Urban Development Framework plan, it is instructive to review similar moments in the Emirate's past when large-scale infrastructural projects generated formal changes in the metropolitan area. The decade of the 1970s, when Dubai enjoyed high capital liquidity from increased oil revenues, marked a prolific time for such infrastructure investment. Concerns over inflation, and the need to further develop Dubai's vocation as a regional entrepôt, guided ambitious infrastructural planning and construction. In contemporary circumstances, high capital liquidity from a more diversified economic base, matched with the desire to continue developing Dubai's international tourism and trade profiles, has launched a new round of infrastructure planning and construction. Recommendations are offered on how these projects will spatially impact the metropolitan form and functionality, and how the Emirate can best prepare for these changes.

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INTRODUCTION

Recently, the Middle East Airport Exchange trade journal announced that the Gulf Cooperation Council (GCC) has 59 active airport construction projects worth a total of US$ 17 billion, stating that it is one of the few regions of the world with plans in place to meet the demands of continued growth in air travel, which will help it to avoid what the International Air Transport Association has described as a "looming infrastructure crisis." The article continued by identifying Dubai World Central as "far and away the biggest, with a 12 million ton annual cargo capacity, three times the capacity of Memphis International Airport (today's largest cargo hub), and 120 million passengers per year, almost 50 percent more than Atlanta's Hartsfield-Jackson International Airport (the world's busiest passenger airport)."[1]

The DWC Web site promises that the new agglomeration construction at Jebel Ali will "eventually be home to 900,000 people, with infrastructure costs estimated at $33 billion, and will be comprised of six specialized clustered zones: Al Maktoum International Airport, Dubai Logistics City, DWC Commercial City, DWC Residential City, DWC Aviation City and DWC Golf City," and thus, a "true 'city-within-a-city.'"[2] The airport complex will be located directly south of the Jebel Ali Port and Free Zone.

As the city embarks upon this ambitious new agglomeration, it is useful to look back to the planning and construction of Dubai's previous large-scale infrastructure projects to understand how their lessons can inform financial and spatial strategies for Dubai's future.

THE 1970S—BOOM!

In the period between 1973 and 1980, Gulf states invested an estimated $4.7 billion developing their commercial ports and $3.0 billion on industrial port construction.[3] The 1973 oil crisis precipitated exponential increases in revenues for the Gulf's oil-producing nations, which also resulted in a

drastic spike in imports for the region. GCC countries did not have the proper port infrastructure to meet the high import demand, causing month-long queues offshore for ships waiting to unload their cargoes. They quickly responded by launching a series of fast-track port construction projects to meet the high demand, resulting in massive investment in infrastructure development throughout the region. The investment in large-scale infrastructure was also part of a strategy for absorption of oil profit liquidity to stave off currency inflation, and to move away from the vulnerability of their rentier economies by investing in diversified port-related industries. As pointed out by Fatima S. Al-Shamsi, one of the explicit points of the UAE's 1979 industrial strategy was "enhancing government participation in large-scale, capital intensive projects and encouraging private investment in productive joint venture activity."[4]

In Dubai, increased oil revenues were channeled into large-scale cluster investments to further develop the city's historic trade vocation. The World Trade Centre, the Port Rashid extension, the Dubai Drydock, and perhaps most significantly, the Jebel Ali Port and Industrial Area, were all inaugurated in 1979, with a combined investment of over $2.3 billion.[5] At 39 stories, the World Trade Centre was the tallest building in the Middle East and Jebel Ali was the world's most ambitious port construction project, touted to rank along with the Hoover Dam and the Great Wall of China among history's preeminent muscular engineering projects.

At the time, however, industry experts worried that these projects were overambitious and would become "white elephants." While Jebel Ali Port signed an agreement with Sea-Land Services to manage the port,[6] Dubai initially had difficulty finding a company to manage the Drydock.[7] Concerns over local operating capacity were matched with the potential of port oversupply as a result of the construction boom precipitated by 1973, due to a general lack of regional project coordination and "an atmosphere of uncertainty, not least because the similar resource base of many of the Gulf states has led each government to invest in broadly similar, often replicated enterprises."[8] Indeed, the Drydock project could be seen as simply an expanded version of the Bahraini Arab Shipbuilding and Repair Yard (ASRY), which had opened years earlier; the Dubai Aluminum Company (DUBAL) at Jebel Ali appeared modeled on Aluminum Bahrain (ALBA), which also predated it; and the Jebel Ali Port itself was very similar to the ambitious Saudi port projects of Jubail and Yanbu. Al-Shamsi underscores the same point, saying "Given the characteristics of Gulf state economies, the drive for industrial development will remain restricted unless it acquires a real (Gulf) regional dimension…. Adherence to a regional strategy may lead to a more efficient resource allocation through reducing the cost of duplication and excess capacity of industrial projects."[9]

The 1980s—Recession and Regional Conflict

Concerns regarding oversupply were well-founded, and this resulted in rate-cutting

competition throughout the region in the early 1980s when oil prices fell.[10] What could not have been predicted, however, was the Iranian revolution in 1979, along with the subsequent conflict between Iran and Iraq throughout the 1980s that, once again, solidified Dubai's geographic position in the southern Gulf as a transshipment center for the entire GCC. The Iran-Iraq War, which included attacks on commercial ships, opened an opportunity for Dubai to receive international cargo flows and re-route them for local and regional distribution. So while fluctuating oil prices would still greatly affect Dubai's growth rate (particularly compared with its vertiginous numbers of the 1970s), regional conflict, in its own way, provided a degree of economic stability for Dubai by spurring increased regional trade through its ports.

Urban Development in Dubai

Along with the regional and international circumstances that framed Dubai's large-scale infrastructure projects throughout the 1970s, the spatial consequences of these projects changed the city's physiognomy. Creek dredging and land reclamation in the late 1950s and early 1960s provided a new surface on which to guide southern Creek development, without having to purchase older plots for new construction. Thus, Baniyas Road would become the city's central business district, mixing heavier industry with commercial and office uses. John Harris's 1959 master plan was little more than a projected transportation armature to loosely structure and guide the rapid new development, and the municipal government established in the latter 1950s was initially simply an administrative entity to implement Harris's plan. Though dredging allowed larger ships to enter the Creek to unload their cargoes (comprised mainly of construction material to fuel the building boom), it was soon clear that a new deep water port was necessary to alleviate congestion and, in 1965, surveying began for the planning and construction of Port Rashid. The Maktoum Bridge and the Dubai Airport rounded out the large-scale infrastructure projects of the 1960s but, in general, these projects did not move far beyond the original settlements of Dubai, Deira and Al Shindagah.

Urban growth and the initial oil revenue capital gave Dubai both cause and resources for Harris to produce a second master plan in 1971, just before the official formation of the Emirates. The ring-radial urban form prescribed in Harris's second plan centered on the Creek and fanned outward on each side, to underscore the continued function of this water element as the structuring growth axis for the city. The break with this morphology began in 1974 with the location choice for the new World Trade Centre facility. Though originally planned for the mouth of the Creek, aviation patterns for the airport would have limited Sheikh Rashid's ambitious height requirements for the project. At the time far removed from the urban limits, construction for the project began on the Abu Dhabi Road, which offered more space for car parking, and opened a new growth axis perpendicular to the Creek.[11]

While the World Trade Centre can be understood historically as a large-scale trade infrastructure which began to move beyond the dictates of the second master plan, it was the scale and force of impact of the Jebel Ali Port and Industrial Area (and subsequently, its Free Zone) that truly changed the metropolitan form of Dubai. In the literature on regional planning and development of this time,[12] the increased spatial demands of port and cargo technology often required port expansion and relocation in cities throughout the world, particularly in France, England and the Netherlands. "Growth-pole" theory was often applied in the regional planning of new port facilities as a way to both understand and plan for the in-fill development projected along the corridors connecting new or expanded port facilities to the city center. Jebel Ali is a clear example of this. Jebel Ali broke with Harris's ring-radial structure, establishing a new growth pole and growth corridor along the Abu Dhabi-Dubai Road, which would eventually become the Sheikh Zayed Road. This new growth corridor ran parallel to the Gulf coast, and would eventually be subdivided into a mosaic of superblocks for residential, commercial and limited industrial use.

The site of Jebel Ali had been ceded to Dubai from Abu Dhabi in the period leading up to federation in February 1968,[13] and as negotiations continued up to 1971, it was also agreed that a new capital city for the Emirates would eventually be located at the Dubai-Abu Dhabi border.[14] In addition, during its planning phases, the Jebel Ali Industrial Port was going to have an international airport, but financial considerations and the eventual Emirates agreement to allow Abu Dhabi continued capital status would eventually scale back the project.[15]

Although the scope of Jebel Ali was scaled back, the project could still be considered an industrial "city within a city." It was originally comprised of the Dubai Aluminum Company (DUBAL), an aluminum smelter and extrusion plant; Dubai Gas Company (DUGAS), a liquefied petroleum and natural gas works that produced the energy to run DUBAL; the Dubai National Cement Factory; and, a desalination and steam power station run by the heat energy output produced by DUBAL. The residential Jebel Ali Village was a project of 300 two- and four-bedroom single-story detached units including a community center, a primary school, a small clinic and a supermarket.[16] In effect, Jebel Ali Village was a small British garden city. The Village was initially built to house the professional team building the Jebel Ali project, but was projected to eventually be passed over to those who would work at the functioning port complex.[17] The isolated and autonomous residential area of Jebel Ali Village would serve as a prototype for future semi-autonomous residential areas throughout Dubai (i.e. The Gardens, Emirates Hills, etc.), along with the shopping malls in the southwestern end of the Emirate that were aimed at serving these residential community districts.

Finally, though the Jebel Ali Free Zone adjacent to the port did not open officially until 1985, this element was included in the project plans from the late 1970s. The Free

Zone began simply as a transshipment and re-export center, particularly for goods passing along the East Asia-Europe corridor. As the percentage of import/export for Dubai and the Gulf region grew, there was an increasing need for processing and assembly functions in the Free Zone. Restrictive land laws prevented foreign companies from owning land,[18] and the only way to set up offices or factories in Dubai was through complex sponsorship agreements with local entities, wherein the local firms would assume 51 percent ownership. The Free Zone allowed international firms to rent warehouse and small processing facilities in Dubai without having to find sponsorship.

Recommendations

In 1988, the office of the Greek architect and planner Constantinos A. Doxiadis published the Dubai Urban Area Plan in a series of reports that detailed an exhaustive inventory of the land usage and resources of the metropolitan area. The Urban Area Plan made this insightful observation:

Development of spatial growth in the urban area will essentially conform with past practices. That is, the majority of the growth will occur on an East-West axis extending from the Central Business District (CBD) to the airport, with the majority of infill development occurring in a North-South axis extending from the CBD to Jebel Ali.[19]

Doxiadis's team understood that Dubai's urbanism has historically followed the growth corridors established by large-scale infrastructure projects, and contemporary circumstances would seem to suggest the same pattern. Dubai is currently crafting a new Urban Development Framework plan in parallel with the ambitious DWC project, and the following recommendations, based on historical precedent, may be instructive for this process.

Phase implementation of DWC

The scale of the DWC project, and the Al Maktoum International Airport in particular, seem to be inspired by similar circumstances as those just after 1973, when high capital liquidity in the Gulf states and undersupply of transport infrastructure initiated an excess construction boom throughout the region. It is not unreasonable to think that a potential dip in oil prices, price-cutting competition due to airport oversupply, and recessionary conditions, as in the early 1980s, may also occur. Historical events in the Gulf, particularly the Iran-Iraq conflict, helped to make the Jebel Ali project a success during financially straining times, but these events, of course, can neither be predicted nor planned. With this in mind, a phased implementation plan for the DWC would seem to be the strategically sound option in order not to over-invest too early.

Coordinate regional infrastructure investment in the GCC

Echoing the recommendations of Al-Shamsi and Walker on port development, regional cooperation in infrastructure investment could help to avoid costly replication and future competition. DP World's management of many Gulf port facilities could be a

potential model, wherein a similar DWC airport manager would outsource to future airports within the region, thus facilitating a more streamlined, coordinated and complementary functionality.

Establish specialization and transition timeline for the dual airport system

The Jebel Ali Port was built at the same time Port Rashid was being expanded, leading to the underutilization of Jebel Ali for some time after its opening. The Al Maktoum International Airport will open as Dubai International Airport has also just undergone an expansion. The division of passenger and cargo movement will be determined once the two airports are functional, but it is useful to keep in mind that in 2008 Port Rashid is only now beginning to phase out its cargo functions to concentrate more on the passenger cruise liner tourist industry.[20] This timeline may be indicative of the transition period that may be required for a similarly co-functioning airport system.

Plan for Emirates Road as new metropolitan growth corridor

Sheikh Zayed Road was the growth corridor established as the second urban spine after the Creek when the Jebel Ali Port was constructed, and it seems likely that with the DWC development and other large-scale leisure and residential projects (Dubailand, Falcon City, etc.), Emirates Road will assume this central structuring function for new development. As such, parallel public transportation should plan to link the Emirates Road corridor with the current Dubai Metro network.

Steward hinterland expansion

Cargo freight will no longer move through Port Rashid. This will have an effect on metropolitan traffic patterns by easing container congestion on Al Qataiyat Road and moving it to the periphery. Passenger traffic on Emirates Road may soon reach a point where cargo traffic will have to be moved further inland, similar to what has occurred with Sheikh Zayed Road. In this sense, until now cargo freight movement has guided urban encroachment into the Dubai hinterland through highway expansion. To properly steward urban expansion into the hinterland, it will be important to better guide and plan for this expansion. Dedicated freight highways, a regional rail system for cargo movement, and a “green” or “brown-belt” environmental swath could all help to better address this expansion in the future.

Increase planning coordination through a supra-free trade area governing body

Finally, just as the Free Zone model established at Jebel Ali has proliferated into diversified service sectors over the past decade (Dubai Media City, Dubai Internet City, etc.), this same autonomous model has splintered Dubai’s planning capacity, as many of these autonomous projects are responsible for their own regulatory and permitting structures. Increased traffic, a strained electricity grid and concerns over water supply are all testament to the dangers of this cellular model, particularly in terms of shared resources and infrastructure. It may be worth considering these free zones as public jurisdictions or new micro-

municipalities, wherein a platform would also be established for their coordination with Dubai's infrastructural and service stakeholders.

Similar to the pressing point mentioned above on land stewardship, a lack of communication among these stakeholders risks compromising the city's quality of life. Thus, beyond simple marketing strategies, it may be prudent to think of a new city of 900,000 people as more of a new municipality within a series of municipalities (or any such similar and appropriate structure), rather than another potentially uncoordinated "city-within-a city."

ENDNOTES

1 Middle Eastern Airport Exchange (MAX), *"Gulf to Avoid Aviation 'Infrastructure Crisis,'"* No. 17, November - December 2007, 31.

2 Dubai World Central Web site, http://www.dwc.ae/dwc.html.

3 A.R. Walker, "Oil-dependent Economies and Port Development: The Gulf States of the Middle East," in *Seaport Systems and Spatial Change: Technology, Industry, and Development Strategies,* ed. B.S Hoyle and D. Hilling (Chichester and New York: John Wiley & Sons, 1984), 187.

4 Fatima Al-Shamsi,"Industrial Strategies and Change in the UAE during the 1980s," in *Change and Development in the Gulf,* ed. Abbas Abdelkarim (New York: St. Martin's Press, 1999), 84.

5 Information comes from Walker, Owen, and Dubai World Trade Centre supplement.

6 P.G. Owen, "Survey of Middle East Ports," *Dock and Harbour Authority,* 59 (695), 164-68.

7 Walker, 192.

8 Ibid, 190.

9 Al-Shamsi, 102.

10 Walker, 195.

11 "Dubai World Trade Centre: 20 Years of Success," sponsored supplement of Gulf Business, April 1999, 31.

12 John Friedmann and Clyde Weaver, *Territory and Function: The Evolution of Regional Planning* (Berkeley: University of California Press, 1979); *Cityport Industrialization and Regional Development: Spatial Analysis and Planning Strategies,* ed. B.S. Hoyle and D.A. Pinter (Oxford: Pergamon, 1981).

13 Ibrahim Al Abed, "The Historical Background and Constitutional Basis to the Federation," in *United Arab Emirates: A New Perspective,* ed. Ibrahim Al Abed and Peter Hellyer (London: Trident, 2001), 128.

14 Ibid, 131.

15 "Mina Jebel Ali," *Construction News Magazine,* September 1978.

16 *Jebel Ali Village.* Sir William Halcrow and Partners promotional publication. Date not specified.

17 Laborers had camp quarters that were built within the industrial port zone.

18 The land law of 1960 established that non-nationals could not own land in Dubai, similar to the Kuwaiti land law which had already been passed. The 2002 land law in Dubai established freehold areas where non-Emiratis could own land, but this was primarily for residential development.

19 Dubai Municipality, *Dubai Urban Area Plan.* Report No. 5, May 1988, xiii.

20 "Port Rashid Ends Cargo Handling Operations," *PortWorld Web site,* http://www.portworld.com/news/2008/jan/70441?gsid=4fc8f732c748568c3a23fcb12ccf8055&asi=1 (accessed January 21, 2008).

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