New Emerald Cities: Mega Developments in the 21st Century

by

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Submitted to the Department of Urban Studies and Planning in Partial Fulfillment of the Requirements for the Degree of Master of Science in Real Estate Development and the Degree of Master in City Planning

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ABSTRACT

This thesis examines the recent worldwide boom in megacity development. Its basis is a global survey of megacity building that quantifies the amount of current development and qualifies the various city types and themes, the countries in which megacities are being built, and the firms that are building them. The key findings from the survey are summarized and analyzed, followed by a closer look at some of the leading city building firms and their role in the global megacity building industry. Next, is an investigation of the critical reasons why city building is occurring on such a massive scale, which together with the survey findings sets the framework for three possible distinct megacity market models. The thesis continues with case studies of three new cities, each with their own unique theme and reasons for being developed. Finally, the megacity phenomenon is assessed from the perspective of broader issues such as sustainability and social impact, and summary conclusions are drawn.

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1. Introduction

First introduced in 1900 in American author L. Frank Baum's series of children's fantasy books, the Emerald City is the fictional capital of the Land of Oz, home to the all-powerful Wizard of Oz, and located at the end of the famous yellow brick road. The Oz books describe the Emerald City as a sparkling beacon, built of green glass, emeralds, and other jewels, that rises majestically from the surrounding plains. In fact, upon entering the city residents and visitors are made to wear green-tinted glasses, in an effort to protect their eyes from the "brightness and glory" of the city (O'Riley, 1997).

The Emerald City, 1939 (Source: *The Wizard of Oz*, MGM Studios)

Scholars who interpret Baum's books as political allegory see the Emerald City as a metaphor for Washington, D.C., comparing it to that city's shimmering but illusory splendor and value. However, in Gregory Maguire's revisionist Oz novels, *Wicked: The*

Life and Times of the Wicked Witch of the West and *Son of a Witch*, the Emerald City is a much darker place than in Baum's novels. It does have splendid palaces and gardens, but also sections suffering crime and poverty, and the green glasses that are worn by the citizens are often used as a way to prevent them from seeing what is really going on around them.

100 years after L. Frank Baum inspired readers' imaginations with stories from the Land of Oz, the world is experiencing an unprecedented global boom in megacity construction. Like the Emerald City, renderings of these projects include monumental clusters of sparkling skyscrapers, often rising from the deserts, plains and river deltas of developing countries. These new cities also present utopian visions of efficiency, comfort,

Madinat al Hareer, "City of Silk," Kuwait (Source: Madinat al Hareer)

convenience and a better quality of life for all. But how realistic are these ambitions, and are they even attainable? This thesis will address these questions.

Notwithstanding the recent real estate slowdown in Western economies, the rest of the world is experiencing a city building boom. Dubai World Central, just one project of many in the Emirate of Dubai, will have 850 new skyscrapers, cover 140 square kilometers, house one million people and cost US $33 billion. Odyssey Science City in Bangalore India will cover 263 square kilometers, employ two million people and cost US $25 billion. China has plans to build 30,000 skyscrapers by 2025, the equivalent of six New York Cities.

Dubai Skyline, intersection of Muscat and Al Khail, November 2007 (Source: Wikimedia)

The sheer magnitude of global city development planned and in production, is staggering. Many of the projects are just a few years old, and the firms developing them are young, as well. As if by magic, though, new cities seem to spring up overnight. Thus the study of 21st century megacity building becomes extremely compelling, specifically because

- No one has yet measured the extent of total global megacity development.
- The development model defies convention, with relatively new and extremely well financed regional and national developers proposing—and building—some spectacular plans.
- Financing is coming from sources that didn't exist a generation ago.
- An unprecedented convergence of favorable conditions is enabling the phenomenon.
- In spite of their optimistic promises, these are serious consequences to megacity building.

Research for this topic begins with a global survey of megacity building that quantifies the amount of current development and qualifies the various city types and themes, the countries in which cities are being built, and the firms that are building them. The key findings from the survey are summarized and analyzed, followed by a closer look at some of the leading city building firms and their role in the global megacity building industry. Next, is an investigation of the critical reasons why city building is occurring on such a massive scale, which together with the survey findings sets the framework for three possible distinct megacity market models. The thesis continues with Case Studies of

three new cities, each with their own unique theme and reasons for being developed: Downtown Jebel Ali in Dubai, King Abdullah Economic City in Saudi Arabia, and Tianjin Eco-City in China. Finally, the megacity phenomenon is assessed from the perspective of broader issues such as sustainability and social impact, and summary conclusions are drawn.

To begin, however, it is necessary for the purposes of this thesis to define 21st century megacities, and consider them in the context of city building's rich history.

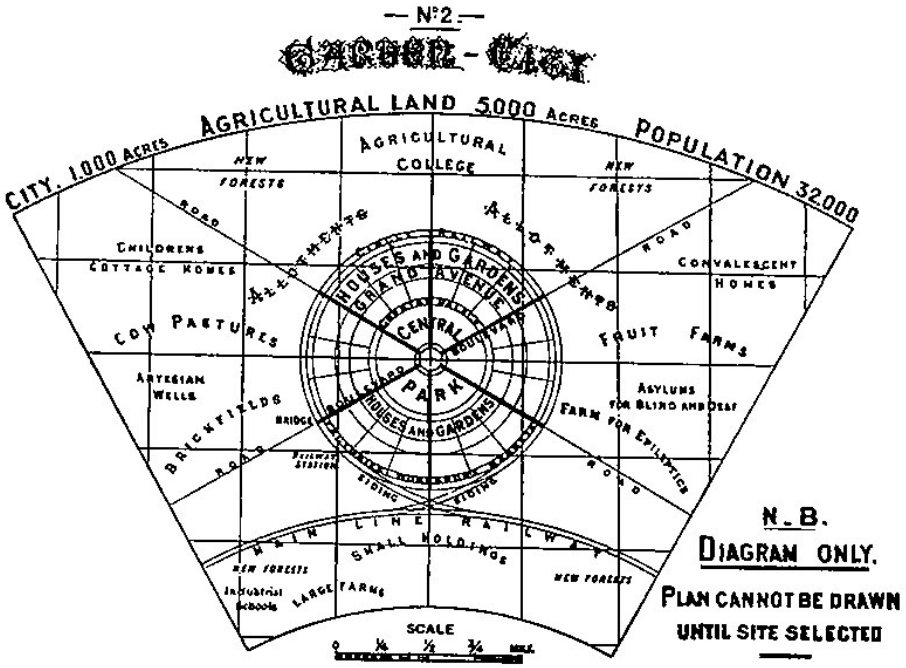
2. History of City Building

The idea of building entirely new cities has ancient roots. The Romans, for example, initiated hundreds of new towns across Europe using a formal design model of gridded streets. The first industrial revolution in the 18th century led to the growth of the modern city as we know it, first in Europe and then elsewhere. Substantial migration of workers from rural communities to urban areas in search of work led to mass urbanization and rapid city growth, which repeated itself in the late 19th century in the United States. This trend continues today. According to a study by North Carolina State University, the world's current population is now slightly over half urban, with millions still streaming annually into growing cities in Asia, India and the Middle East. Interestingly, some of today's rapidly growing cites in developing countries face the same problems as the growing cities of the 18th and 19th century. For certain segments of the population those industrial cities were unhealthy places in which to live, due to contaminated water and air, poor housing conditions, and overcrowding. In response to such conditions in 1898, a new approach to urban planning was conceived, called the Garden City Movement.

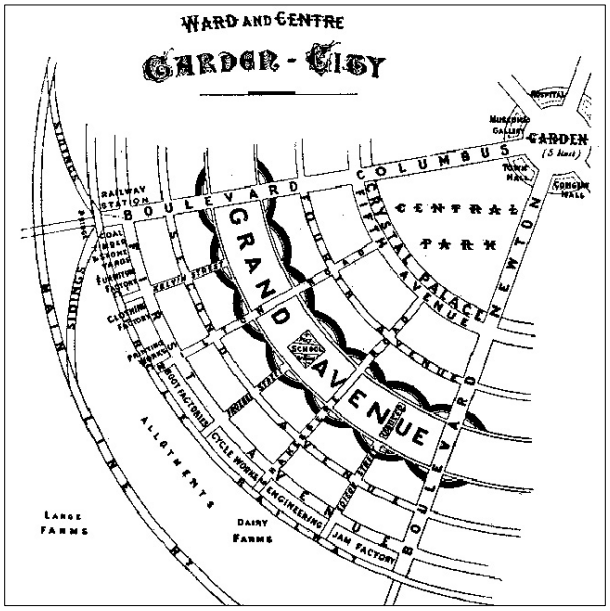
2-A. Garden City Movement

Sir Ebenezer Howard proposed the new movement, although the 'City' name is a bit misleading. In retrospect, they appear to be more like suburban towns, with 20,000 to 30,000 residents and transit access to nearby cities. But in their time, the intention was that Garden Cities would be master planned, self-contained new communities including residential, commercial, industrial and agricultural uses, with a radial street design for

easy access, surrounded by greenbelts. The aim was to combine the best of the city with the best of the country.



Howard's Standard Garden City Plan (Source: Garden Cities of To-Morrow)



Plan detail from a Garden City (Source: Garden Cities of To-Morrow)

The first Garden City was developed in 1903 by a private company, First Garden City Ltd., on 16 square kilometers of land at Letchworth in Hertfordshire, England. In the beginning, First Garden City, Ltd. owned the land upon which the city was built (the estate) and was responsible for managing it. In later years city management was given over to a public body, the Letchworth Garden City Corporation, and then by the Letchworth Garden City Heritage Foundation, a private non-profit foundation charged with managing the town together with an elected town council.

Letchworth inspired a number of other Garden City ventures. Welwyn Garden City was founded in the UK by Howard in the 1920s, while other model towns were developed in Radburn, New Jersey; Forrest Hills, New York; and Mariemont, Ohio. Planning practices espoused by the Garden City movement also influenced Canberra, Australia; Tel Aviv, Israel; and Tellarau in Dresden. Each followed the same model of a private developer building a new public town, although instead of being distinct town units, many eventually became bedroom suburbs for larger, nearby cities.

2-B. The Modernists

Beginning in the 1930s, there was a reaction to traditional forms of architecture in response to the new economic conditions of an emerging fully industrialized world. The modern form of development saw erasing older traditional models of the city and replacing them with clean, highly efficient, automobile oriented and a-cultural urban forms that would be the same at every location -- an "international style". The focus was

on progress, and modernist architects and designers believed that new technologies rendered old styles of building obsolete. One of the most influential (and early celebrity) architects, Le Corbusier, thought that buildings should "function as machines for living in" (Vers une Architecture, 1923). Seen as progressive, the modern style became the reason d'être for developing new cities—to express the progressiveness of a country or society or developer—rather than the social objectives on the Garden City movement.

A landmark effort in the creation of Modern cities was Brasilia, a new capital city for Brazil, built according to Corbusier's 'towers-in-the park' philosophy of efficiency, with high-rise residential buildings around expansive open areas and a city built around large ribbons of roadway, dividing it into sectors. Created from scratch in Brazil's hinterland, Brasília was designed by architect Oscar Niemeyer and built in 41 months, from 1956 to 1960. Unfortunately, the City's modernist design is notorious for its windswept emptiness and anti-pedestrian layout. Most streets have cloverleafs or traffic circles rather than intersections or traffic lights, so cars have no reason to stop, and pedestrians complain that it is impossible to travel without crossing the axial expressway and risking their lives in underpasses.

Architecture critic Lewis Mumford writes that "the extravagant heights of Le Corbusier's skyscrapers had no reason for existence apart from the fact that they had become technological possibilities; the open spaces in his central areas had no reason for existence either, since on the scale he imagined there was no motive during the business day for pedestrian circulation in the office quarter. By mating utilitarian and financial

image of the skyscraper city to the romantic image of the organic environment, Le Corbusier had, in fact, produced a sterile hybrid" (Mumford, 1986). A damning review, indeed.

But modernist planning of new cities persisted. Following the death of architect Matthew Nowicki, Le Corbusier himself took over planning for the new capitol of India at Chandigarh, established in 1966, and his theories were also carried out in numerous public housing and regeneration projects in Europe and the US during that time. Forty years later, the shortcomings of modernist city design are finally being acknowledged, with many of those housing projects being razed or substantially altered.

2-C. New Towns

Following WWII, the severe destruction of older cities, plus the desire to implement a more rational approach to urbanization led to a wave of new cities. In Britain directly after the war, Mark I New Towns were designed to absorb new growth away from London to locations outside the city. Mark II New Towns of the 1960s and 70s, too, were partly intended to relieve urban development pressure, but were also used as a method for resuscitating declining economies of peripheral parts of Britain. The most ambitious project, Milton Keynes in Buckinghamshire, was formally designated as a new town in 1967, incorporating the existing towns of Bletchley, Wolverton and Stony Stratford along with another fifteen villages and farmland in between. Milton Keynes would have a population of 250,000 and cover 88.4 square kilometers, based on a modernist, one kilometer street grid, in which the street became limited access highways.

Planning control was taken from elected local authorities and delegated to the Milton Keynes Development Corporation (MKDC). The Government closed MKDC in 1992, transferring control to the Commission for New Towns (CNT) and then finally to English Partnerships, with the planning function returning to local authority control. Previously restricted to low rise, low density development, recent zoning changes now allow buildings up to 14 stories and higher residential densities.

In the US, the private development sector took the lead in new town creation, as opposed to the public initiatives in England. Columbia, Maryland, was announced in 1967, after developer James Rouse acquired 57 square kilometers of land outside of Baltimore, along with his partner, the Connecticut General Life Insurance Co. At this unveiling, Rouse described Columbia as a planned new city, which would be complete with jobs, schools, shopping, and medical services, and a range of housing choices. The property taxes from commercial development would pay for the additional residential services that would otherwise burden the county. Columbia was not incorporated, however, some governance would be provided by the Columbia Association, which today manages common areas and functions as a homeowners' association for private property owners. Roused conceived a new city that would eliminate racial, religious, and income segregation, and not be merely a commuter suburb. Thus, the Master Plan called for a series of ten self-contained villages, the centerpiece of which is the Mall in Columbia and a man made lake. Despite Rouse's intentions, the town has today acquired many of the characteristics of other contemporary US suburbs, such as increasingly large private homes on large parcels, and big-box retail stores accessible mostly by automobile.

2-D. New Urban Districts

While the modernists were building entirely new cities in Brasilia and Chandigarh, and New Towns were growing outside the city limits, older cities were pursuing programs to rebuild large sections destroyed by WWII, or slating for redevelopment areas considered derelict. The latter strategy was an effort to stem the growing central city abandonment and suburban migration of residents and businesses. Government sponsored 'urban renewal' programs, whereby urban land deemed blighted but still inhabited was systematically cleared for redevelopment, were unique in that cleared land was developed by private real estate developers rather than city governments.

One such new urban district is Battery Park City in New York City, a 0.4 square kilometer planned community located at the southwestern tip of lower Manhattan. The land upon which it stands was created from the Hudson River using 1.2 million 917,000 cubic meters of dirt and rocks excavated during the construction of the World Trade Center. The initial proposal to reclaim this area through landfill was offered in the early 1960s, but it was not until 1968 that the New York State Legislature created the Battery Park City Authority (BPCA) to oversee development. The BPCA delivered a master plan in 1969, and in 1972 in $200 million in bonds were issued to fund construction efforts. Throughout the 1980s and 1990s, the Battery Park City Authority oversaw a great deal of construction, including Olympia & York's World Financial Center and multiple residential towers. Numerous buildings were damaged during the terrorist attacks on September 11, 2001, and temporarily reduced rents and government subsidies were

necessary to restore residential occupancy. But, today there are over 30 occupied towers, and real estate development in the area actively continues.

Canary Wharf (Source: Davenport Wind Engineering, Canada)

In the UK, Olympia & York was also instrumental in developing Canary Wharf, a 21 square kilometer commercial center and shopping development in the London Docklands. The London Docklands Development Corporation, set up by the UK Government in 1981 to regenerate the derelict Docklands, signed a Master Building Agreement with Olympia & York for 1.2 million square meters of class A office space, to be a new international financial center. Phase one of the development was complete by 1990, and critically, Olympia & York agreed to extend the commuter rail line to make Canary Wharf accessible to the rest of the city. The London commercial property market collapsed in the early 1990s, however, and Olympia & York filed for bankruptcy in May 1992. A new investors group rescued the project in 1995. Not only were the remaining

phases completed, but new phases were built and the rail extension completed. By 2004 a new investors group took ownership and floated stock in the development on the London Exchange. Plans are now underway for Canary Wharf to more than double in size again, filling out the original 21 square kilometer parcel of land.

Garden Cities were intended to relieve pressure from urban development and create bucolic, peaceful, self-sufficient communities for their inhabitants. After many years Milton Keynes did exceeded its planned population of 250,000 but didn't really relieve population pressures on London, and it remains a low density bedroom community, mostly dependent on adjacent cities and reliant on highways. Modernist Cities, on the other hand, promised speed, efficiency, order and cleanliness, yet they were isolating and impersonal. Many developments with modernist plans have since been either razed or dramatically altered to be more functional and livable. Neither Brasilia nor Chandigarh were ever fully built out or populated to the level at which they were originally envisioned. Finally, the strategy of building New Urban Districts has seen mixed results. Some tracts of land cleared for urban renewal in cities during the 1950s and 60s remains vacant still today, unable to draw interest from suburbanites or developers. Yet in other cases, where underlying market fundamentals were supportive of such urban redevelopment, projects like Canary Wharf and Battery Park City have been successful in re-energizing formerly abandoned parts of the city.

3. Megacity Defined

What, then, are 21st century megacities? Many share the same characteristics of cities built in the 20th century—they may be radical, or physically oversized, or driven by some social or economic agenda. But 21st century megacities are even more ambitious and even more audacious, and the sheer volume and cost of total proposed global development is astounding, as will be revealed in Section 4. Even more remarkable is that the megacity development boom is a recent phenomenon, barely ten years old.

In order to engage in the research and analysis of megacities, it is necessary to narrow the focus of inquiry by first defining what a megacity is before investigating such developments in more detail. For the purposes of this thesis, megacity and mega development may be used interchangeably, but are nonetheless defined as including the following characteristics:

1. Having extensive range of uses, including some combination of office and other commercial, various residential types, service and destination retail, industrial and production, cultural and entertainment, educational and health, and pubic space.
2. Large, within the context of the country in which it is built, as measured either by total investment, land area, or population.
3. Entirely new, developed all at once or within a few phases, and by one for-profit developer.

4. Geographically defined and fully master planned, either by a single developer or government entity.
5. Built on virgin or vastly underdeveloped land.
6. Vertical as well as horizontal, and dense.
7. Follow a short development schedule.

New megacity at Al Reem Island, Abu Dhabi (Source: Al Reem Island)

Megacities are *not*:

1. City-block scaled, large urban infill.
2. Merely large mixed-use projects.
3. Single purpose developments, such as resorts, sports parks, or mega malls.
4. Low-rise, suburban office parks or residential districts.

Thus by this definition, Brasilia and Chandigarh as originally planned would have qualified as megacities due to their land area, mix of uses and expected population. And although smaller in area, Canary Wharf and Battery Park are satisfactorily dense, vertical and mixed-use to also be considered megacities. The Garden Cities, however, would likely not qualify, due to their relatively low density and suburban location, and the fact that many emerged to be principally bedroom communities, even though some have more recently grown to be quite large and populous, distinct cities.

In the developing world of 2008, Abu Dhabi's Al Reem City, for example, is clearly a megacity, with a cost of US $38 billion, expected population of 280,000, 125 proposed skyscrapers and an extensive mix of uses in four districts. The three Palms developments in Dubai, however, are not. Though extremely large, initially featuring a total of 13,000 villas, 5,000 apartments and 60 hotels, they are primarily luxury residential and resort enclaves.

It should be noted that when qualifying megacities based on various measures of size, consideration must be given to the context within the country in which the city is being built. Which is why, for example, Phenom Penh New Town, the first and largest new urban development project in Cambodia, costing US $2 billion and covering 1.9 square kilometers, qualifies as a megacity in Cambodia but would likely not be deemed one in Dubai. Furthermore, budgets are a function of local labor and material costs, thus one may get 'more city for the dollar' in different countries. Generally speaking, though, we should expect megacities to have at minimum a budget exceeding $US 2 billion, a

population greater than 25 million, permanent employment in the tens of thousands, or some combination of each. In fact, most megacities far exceed these metrics, as is evident in the following section, which introduces the global survey of megacity building and its key findings.

4. Megacity Survey

To understand the dimensions of the new megacity phenomenon, I conducted a global survey of projects now in planning, financed or under construction. The list is not complete—new projects are being announced daily. But it is sufficient to give a sense of the scope of the phenomenon and draw some conclusions about what is happening. Data was gathered from May 6, 2008 to August 1, 2008. Due to the relatively recent nature of the global megacity boom, most information was collected from online sources and from a large number of colleagues who are intimately familiar with projects occurring around the world, as well as the regional market dynamics. Real estate blogs such as SkyScraperCity.com proved to be a valuable resource for uncovering less recognized projects, as well as current construction photos of higher profile developments. Information was also available from more traditional media sites such as WallStreetJournal.com, AMEinfo.com, and MEED Middle East Business Intelligence. Facts were then cross checked with company and project Web sites, and data consolidators such as Zawya.com and Google Finance.

4-A. Key Findings

As one might imagine, not all facts from these various sources are consistent, but every effort was made to distill the data into a useful summary of global megacity development activity. The results of the survey reveal that there is a staggering amount of global megacity development currently taking place (see Tables 1 & 2):

- There are over 100 megacities now in planning, financed or under construction in 30 countries.
- A majority are taking place in the Middle East (47), although megacities are also planned for less familiar locations such as Tunisia, Sudan, Vietnam and Ukraine.
- Measured by land area, the six biggest megacities are each 250 square kilometers or larger (five times the size of Manhattan), and five of six are located in the Gulf Region. The largest (Amwaj Bouregreg) is in Libya.

Table 1 - Megacity Survey Quantitative Summary

Megacity Survey Quantitative Summary		
Number of Megacity Developments		**101**
United Arab Emirates (UAE)	*24*	
Other Middle East	*23*	
Northern Africa	*6*	
Central Asia	*14*	
Southeast Asia	*12*	
China Region	*12*	
Russia	*1*	
US, UK, Europe	*9*	
Number of Countries Represented		**30**
Total Expected Cost ($US) *(66 of 101 projects reporting)*		**$958 billion**
Total Permanent Employment *(28 of 101 projects reporting)*		**9.6 million**
Total Land Area *(80 of 101 projects reporting)*		**3,700 sq km**
Total Expected Population *(54 of 101 projects reporting)*		**18 million**
Average Completion Date *(64 of 101 projects reporting)*		**2018**

Source: Megacity Survey, 2008, appendix A

- Measured by population, six megacities exceeding 1 million people.
- Measured by expected cost, the five most expensive megacities have budgets exceeding US $50 billion each, and are concentrated in the Middle East. The most expensive megacity, however, is Globe City in Russia (US $154 billion).
- Total expected construction cost is nearly US $1 trillion, however with only 66 of the 101 cities in the survey reporting budgets this figure is probably closer to US $2 or $3 trillion.

Table 2 - Megacity Survey Qualitative Summary

Megacity Survey Qualitative Summary		
Top 5 Largest Developments by Expected Cost ($US)		
Globe City	Russia	$154 billion
City of Silk	Kuwait	$86 billion
Al Zorah	Ajman, UAE	$60 billion
Mohammad Bin Rashid Gardens	Dubai, UAE	$54 billion
Lusail City	Qatar	$50 billion
Top 6 Largest Developments by Land Area (sq km)		
Amwaj Bouregreg	Libya	380 sq km
Liang New Town	China	300 sq km
Odyssey Science City	India	263 sq km
Sudair Economic City	Saudi Arabia	257 sq km
City of Silk	Kuwait	250 sq km
Karachi Waterfront	Pakistan	250 sq km
Developments with Expected Population over 1 million		
Tangshen Eco-City	China	1 million
Aktau	Kazakhstan	1 million
Carbon Neutral City	Jordan	1 million
Sudair Economic City	Saudi Arabia	1 million
Dubai Waterfront City	Dubai, UAE	1.5 million
King Abdullah Economic City	Saudi Arabia	2 million
Number of Megacities by Type		
New Metropolis	15	
City in a City	38	
Annex City	8	
Satellite City	40	

Source: Megacity Survey, 2008, appendix A

- With only 54 or 101 megacities reporting, total expected permanent population is nearly 18.5 million people, slightly less than the population of Southern California, or equal to that of Australia. Again, the actual figure for all 101 megacities included in the survey is likely to be two or three times greater, perhaps more.
- With only 28 of 101 megacities reporting, total expected permanent employment is 9.6 million people, equal to three times the employment of Massachusetts of 3.2 million (Bureau of Labor Statistics), or roughly 2/3 that of California's 15.1 million. The actual figure for all 101 megacities included in the survey is likely to be two or three times greater, perhaps more.
- The total land area of megacity building for 80 of the 101 developments is over 3,700 square kilometers, bigger than the State of Rhode Island.
- With 65 of 101 projects reporting, average expected completion is 2018.

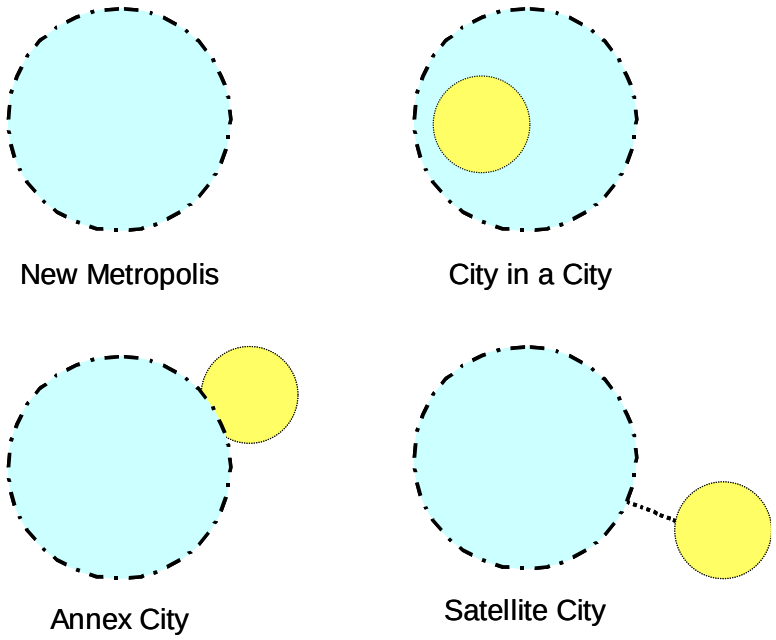
4-B. Megacity Types

The survey also reveals a pattern of physical form for megacities that allows them to be categorized by type, based primarily on their relationship to the surrounding built environment. The four different megacity types are ***New Metropolis***, ***City in a City***, ***Annex City***, and ***Satellite City*** (see Figure 1).

- A *New Metropolis* is characterized by its physical size, population, location and program. These are the huge, spectacular and audacious proposals such as the City of Silk in Kuwait (US $86B, 250 sq km, pop. 700,000) and the New

Manhattans in Delhi and Mumbai, India (US $10B, 81 sq km, pop. 1,000,000). A New Metropolis includes all of the activities and land uses one would find in an international city such as New York or Tokyo. Its population reaches into the hundreds of thousands and it is built entirely from scratch on a greenfield site that is often separate from any existing development. Historical examples include Brasilia and Chandigarh.

Figure 1 – City Types



- The *City in a City* may itself be quite big, but it is built within a new or existing metropolis. It, too, has numerous mixed uses and a significant population, but a City in the City also relies on the physical and social connection to the surrounding urban fabric. It often has a specific theme and accompanying use, and may instead be referred to as a zone or district. Battery Park and Canary

Wharf discussed earlier would each be considered a City in the City, as would cities such as Millennium City in Seoul, South Korea (6.6 sq km) and Liverpool Waters in the UK (US $10.8B, 0.6 sq km).

- An *Annex City*, like the City in a City, may have considerable size and mixed uses, but instead of being contained within the larger metropolis, it is an extension of the existing city scope. In some cases, an Annex City will be large enough to be self-sufficient, such as Lusail in Qatar (US $50 billion, 35 sq km, pop. 200,000), which is a significant expansion of Doha.
- *Satellite Cities* are self-contained entities built on greenfield sites outside the boundary but within close proximity to a larger metropolis, not unlike Garden Cities of the 20th century. And like a City in the City, a Satellite City may have a specific theme and use, or it may simply be built to relieve development pressure in the metropolis to which it is adjacent, thus densifying suburbia. Importantly, Satellite Cities included in the survey are not merely large suburbs but distinct cities unto themselves. Such cities include Liang New Town in China (300 sq km, pop. 800,000) and Stapleton in Colorado, USA (18.6 sq km, pop. 600,000).

4-C. Megacity Themes

Furthermore, even though megacities by definition include a variety of uses, many of the developments studied in the survey have distinct themes, such as financial, entertainment or knowledge. Intentionally characterized either by the developer or by the sponsoring government, these themes reveal the strategy behind a number of the cities in the survey:

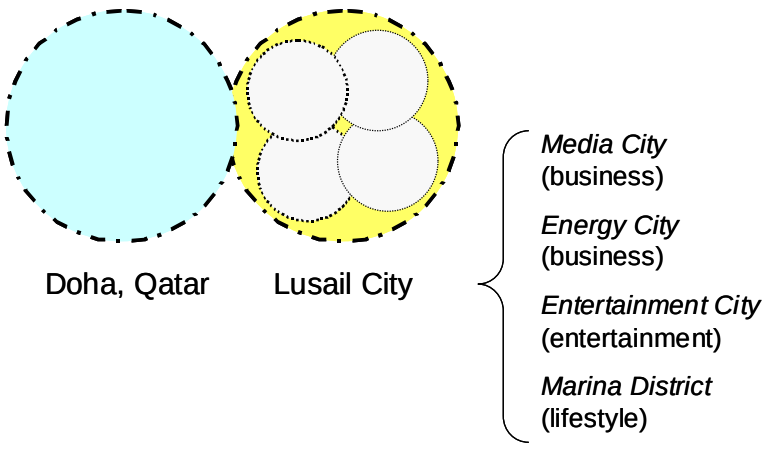
- *Economic* – The purpose of the Economic City is to establish new cutting edge industrial sectors that were previously absent from the country's economic base, thereby stimulating economic development and creating prosperity and jobs. The product mix for Economic Cities usually includes office and commercial centers, ports and industrial parks as well as residential components. Recent examples are the seven Economic Cities in Saudi Arabia and the Blue City in Oman.
- *Business* – This strategy is directed toward the needs of regional, national, and international businesses, including Class A office space, upscale hotels, and executive housing. Examples of business focused cities include the Tunis and Bahrain financial harbors, and the Energy and Media cities that are part of Lusail in Qatar.
- *Knowledge* – Learning is at the center of knowledge themed cities, with schools, universities, libraries and museums, R&D facilities and business incubators as part of the program. Knowledge based cities can be found in Qatar, Saudi Arabia and India.
- *Environmental* – The focus of Environmental Cities is zero-carbon operation, sustainability, or renewable energy initiatives. Examples include Masdar in Abu Dhabi, Tianjin Eco-City in China, and the carbon neutral city in Jordan.
- *Lifestyle* – Having as an anchor a variety of typically upscale residential offerings, the Lifestyle City also includes a mix of office, commercial, leisure and service retail. The marketing position here is that the development satisfies all of the lifestyle requirements of 'successful' people. Several Lifestyle Cities are being

built along Emirates Road in Ajman, UAE, including Berjal, Awali and The Boulevard.

- *Entertainment* – Leisure activities and attractions such as live entertainment, destination retail, movie theaters and sports facilities are the anchors of Entertainment Cities. While most new entertainment districts are too small to be considered megacities, the scale of Dubai Festival City does qualify it to be an Entertainment City.
- *Comprehensive* – A city with no singular theme itself but that includes a combination of city themes and myriad uses is a Comprehensive City. Typically, these are also the New Metropolises, cities so large that they include nearly all uses imaginable.

Not surprisingly, it is possible for megacities to share overlapping themes. Masdar in Abu Dhabi (US $22B, 6 sq km, pop. 100,000) intends to be not only an innovative zero-carbon Environmental City, but also the center of an entirely new global industry based

Figure 2 – Lusail City, Doha



on renewable energy, and thus it is an Economic City as well. Likewise, some megacities satisfy the definition of more than one city type, such as Qatar's Lusail City ((US $50B, 35 sq km, pop. 200,000), which is large enough to be a New Metropolis yet as an extension of Doha is primarily an Annex City. In fact, Lusail also contains four Cities in the City, featuring business, entertainment and lifestyle themes (see Figure 2).

In summary, the megacity survey reveals that there are four overall city types—New Metropolis, City in a City, Annex City, and Satellite City—and that megacities follow seven general themes, including Economic, Business, Knowledge, Environmental, Lifestyle, Entertainment, and Comprehensive. The survey also quantifies the magnitude of city building occurring worldwide, with over 100 developments proposed or currently under construction, ranging in size from less than a few hundred hectares to nearly 400 square kilometers, and costing as much as US $150 billion. Total megacity building activity worldwide easily exceeds US $2 trillion, with an average completion date of 2018. But who is it that actually builds these developments and how do they do it at such a scale? The next section looks more closely at the megacity developers, how their firms are structured, and their role in the global megacity building boom.

5. Megacity Developers

Megacity developers are fundamentally different than their more conventional predecessors. They manage multiple globally dispersed and often enormously complex projects. They also aggressively partner across borders, or even with competitors, to pursue development opportunities. And in some cases, primarily in the Middle East, these firms are remarkably young.

To better understand the global megacity development industry, Table 3 summarizes information about megacity developers gathered in the Megacity Survey. In comparing megacity development firms, a number of interesting observations emerge:

- Developers with the most projects in progress or under management are well represented globally: ALDAR (39), DAMAC (63), Nakheel (50), Emaar (57), DLF (88), China Vanke (230), China Overseas (130), CapitaLand (110), and Forest City Enterprises (225).
- Developers of the most expensive megacities (see Table 2) are Tamdeen (City of Silk, Kuwait), Solidere (Al Zorah, Ajman), Dubai Properties (Mohammed Bin Rashid Gardens, Dubai) and Lusail in Qatar (Qatari Diar). None of these developers is large by number of projects, yet they control the developments with the biggest budgets.
- For Middle Eastern firms, revenues are difficult to ascertain and employment data is inconsistent. Also, employment data for Asian firms is thin. Thus, even though

Table 3 – Megacity Developers

Sample of Developers from the Megacity Survey						
Name	**Country**	**Employment**	**Number of Developments**	**Revenues ($US)**	**Different Markets**	**Founded**
ALDAR	Abu Dhabi	13,000	39		4	2004
Mubadala	Abu Dhabi	150	13		7	2002
Masdar	Abu Dhabi	112	1		1	2006
Reem Investments	Abu Dhabi	400	4		4	2005
Sorouh	Abu Dhabi	200	23		2	2005
Tamouh	Abu Dhabi	5,000	12		1	2004
DAMAC	Dubai	7,000	63		9	1995
Dubai City of Aviation	Dubai	100	5		1	2005
Dubai World	Dubai	50,000	21		8	2006
Limitless	Dubai	300	11		7	2005
Nakheel	Dubai	2,500	50		3	2001
Dubai Holding	Dubai	14,000				2001
Dubai Properties	Dubai	1,500	15		1	2002
Jumeirah Group	Dubai	11,000	10		7	1997
Sama Dubai	Dubai	515	14		9	2004
TECOM	Dubai	250	12		3	2000
Tatweer	Dubai	400	9		1	2005
Emaar	Dubai	5,000	57	3.8 billion	12	1997
Tameer	Dubai	350	27		6	1991
DLF	India	2,600	88	933 million	20	1945
MARG	India	350	10		5	1994
Unitech Group	India		43		9	1974
Saraya Holdings	Jordan	210	5		4	2005
Tamdeen Group	Kuwait	500		42 million		
Solidere International	Lebanon	370	12		3	1994
Qatari Diar	Qatar	300	23		12	2004
Bin Laden Group	Saudi Arabia					1931
Tanmiyat Group	Saudi Arabia	350	13		4	1982
Al Hanoo	Sharjah	850	6		2	1972
China Vanke, Ltd.	China	3,000	230	4.9 billion	26	
Country Garden Holdings Co.	China		45	2.6 billion		
Financial Street Holding Co.	China		1	615 million	1	
China Green Town China Holdings	China			836 million	14	1995
Guangzhou R&F Properties Co.	China			2.7 billion	27	1994
Shimao Property Holdings	China		34	2.7 billion	21	
Xinyuan Real Estate Co.	China		14	307 million		
Agile Property Holdings	Hong Kong		51	1.5 billion	18	
China Resources Land	Hong Kong			718 million		1996
China Overseas Land & Investment	Hong Kong		130	2.1 billion		
Henderson Land Development Co.	Hong Kong			406 million		1996
Hopson Development Holdings	Hong Kong				4	1992
Kerry Properties	Hong Kong		21	1.8 billion	6	
Wharf Holdings	Hong Kong			2.2 billion		1986
MMC Corporation	Malaysia	4,400		804 million		1911
CapitaLand	Singapore		110	2.7 billion	20	
Jurong International	Singapore					
Keppel Land	Singapore			1 billion		1890
Daewoo Engineering & Construction	Korea			6 billion		1973
Forest City Enterprises	USA	4,484	225	1.2 billion	35	1920
Related Companies	USA	5,800		3 billion		1972
Gale Company	USA	450		22 million		2001

Source: Zawya, Hoovers, Google Finance, Yahoo Finance (see Appendix 3 & 4)

- Western markets are relatively transparent, making industry generalization sis difficult. However, measured by revenue, it appears that Daewoo Korea (US $6B), China Vanke (US $4.9B), Emaar (US $3.8B) and Related (US $3B) are some of the largest developers in the survey.
- Asian and US developers are generally active in more markets, although they tend to be domestic, while Middle Eastern developers reach regularly into neighboring countries.
- Generally speaking, most development firms in the UAE were formed within the last ten years, while many Chinese and Hong Kong firms were established in the 1990s, and Saudi and Indian firms were formed in the 1970s and 1980s. The oldest firms are equally distributed globally—Forrest City Enterprises (US, 1920), Saudi Bin Laden Group (Saudi Arabia, 1931), MMC (Malaysia, 1922), Keppel Land (Singapore, 1890), and DLF (India, 1945).

Furthermore, while most megacity developers are already large, they often form alliances for specific projects or form strategic partnerships, enabling them to pursue a bigger share of megacity development or to extend their reach into foreign markets:

- Al Maabar is a partnership between Abu Dhabi's four largest real estate developers, Sorouh, ALDAR, Al Qudra and Reem Investments, whose strategy is expansion into overseas markets. The venture is already developing two megacities, one in Jordan (Aqaba Port City, US $5B) and the other in Tunisia (Bled El Ward, US $10B).

- Sorouh Real Estate, Tamouh, and Reem Investments are also co-developing Al Reem Island in Abu Dhabi.
- Odyssey Science City (US $25B) in India is being developed by a partnership between the Jurong International Group of Singapore and Australia's Springfield Land.
- Dubai's Nakheel and India's largest developer DLF are partnering to build Manhattan sized new cities in Delhi and Mumbai.
- Emaar Properties and Dubai Holding, two of Dubai's largest firms and otherwise ardent competitors, recently swapped stock shares for land, establishing a new strategic partnership to pursue further growth in the UAE and other international markets.
- Singaporean firms also have global strategies, as is evident with cross border partnerships by CapitaLand in Bahrain (Bahrain Bay, US $2.5B) and Keppel Land in Tianjin (Eco-City, US $7.1B).

Moreover, it is interesting to note the interconnections within existing holding companies:

- Mubadala, the investment arm of the Abu Dhabi government, has a 17% stake in ALDAR Properties and a stake in New York-based Related Companies. It has also formed joint ventures with The John Buck Company of Chicago to develop Suwwa Island near Reem Island (Abu Dhabi), and with Asia's CapitaLand to build the Arzanah project at Zayed Sports City (Abu Dhabi).

- Dubai Holding owns five of the largest developments firms in the region, Dubai Properties, Jumeirah, Sama Dubai, TECOM and Tatweer, while Dubai World owns both Nakheel and Limitless.
- China Resources Land also owns a significant share of China Vanke, Ltd., and is itself part of US $6.5 billion China Resources Enterprises.

Additionally, not all megacity developers are master developers. Some choose instead to focus at the project level, buying large tracts of land from master developers and building them out according to the master plan. DAMAC (Dubai) and ALDAR (Abu Dhabi) are extraordinarily successful developing large components of master planned cities, concurrently building dozens of buildings with specific product types such as residential and retail. The industry also includes an extensive network of secondary, or sub-developers, many of which are themselves quite large but concentrate mainly on developing individual parcels one at a time, again as part of the larger master developments. Such firms include Deyaar (Dubai), Hydra Properties (Abu Dhabi), and Bonyan Emirates Properties (see Appendix 5).

While most megacity development is being done by developers from the Gulf Region, Asia and India, a few projects are being led by large Western firms, as is the case with New Songdo City in Korea (the Gale Company), Liverpool and Wirral Waters in the UK (Peel Holdings), and Atlantic Yards (Forest City Ratner) and Hudson Yards (Related) in New York. Comprehensive developer profiles and specific company data can be found in Appendices 3 & 4.

Indeed, megacity developers are different than their more conventional predecessors. What is most remarkable about the Middle Eastern developers in particular is how they have risen in such a short time to dominate a large portion of the global industry. This is due in part to their masterful ability to leverage numerous subsidiaries and inter-firm partnerships to extend their global reach and secure ever larger projects. But as we'll see in the next section, the flurry of global mega development is the result of an unprecedented convergence of myriad external economic, political and social factors that enable and encourage massive megacity building.

6. Reasons for the Megacity Building Boom

There is no single reason that explains the unprecedented level of global megacity development in the last ten years. Instead, the convergence of multiple factors, mostly as a result of rapid globalization, has hastened economic development, urbanization and thus modernization of developing countries. Some of the factors are proactive, while others are reactive, but all have accelerated the velocity of megacity building in developing countries.

6-A. Global Urbanization

The developing world is currently experiencing unprecedented urbanization, which is having a dramatic effect on the physical structure of cities. In 1950 less than 30% of the world's population lived in cities, but this number grew to 47% and 2.8 billion people by the year 2000, and is expected to grow to 60% by the year 2025, according to the Program for Global Change at the University of Michigan. The transformation is the result of two factors: accelerating population growth and rapid in-migration from rural to urban areas as people are lured to cities by the promise of higher paying jobs and improved standard of living.

Nowhere is this rapid urbanization more evident than in China. A 2008 report entitled 'Preparing for China's Urban Billion,' predicts that if current trends hold, China's urban population will expand from 572 million in 2005 to 926 million in 2025 and hit the one billion mark by 2030. In 20 years, China's cities will have added 350 million people—

more than the entire population of the United States today, and will have 219 cities with more than one million inhabitants—compared with 35 in Europe today (McKinsey, 2008). In 2001 the Chinese government outlined its commitment to growth by announcing a goal to build 400 new cities of 1 million people each by 2020, or 20 new cities a year for 20 years. If trends continue, it is estimated that China's cities will build almost five million buildings from 2005 to 2025, of which almost 30,000 would be skyscrapers, the equivalent of six New York Cities (McKinsey, 2008).

While China's rapid urbanization occurs in response to the demands of a growing economic base, Saudi Arabia's city building initiatives are a response to political forces and rapidly changing demographic circumstances. Unlike China's relatively flat population growth rate, Saudi Arabia's population is growing at 2.6% annually. The 1992 census put the total population at almost 17 million, in 2000 it was estimated at 22 million, and in 2010 it is estimated to be 30 million. More importantly, at least 60 percent of the population is under 20 years old (Washington Post, 2001). Concerned about this population explosion and its impact on the job market and unemployment, the Saudi Government has launched six 'Economic' and 'Knowledge' Cities. These newly constructed cities are part of Saudi Arabia's strategy to promote private sector development in order to diversify its oil-rich economy, and increase employment opportunities for its young and fast growing population (AMEinfo, 2007).

Some version of this scenario repeats itself throughout the developing world—opportunities presented by the growing global economy accompanied by population and

demographic shifts encourage aggressive building programs, in order to accommodate the tremendous influx of people migrating from less developed areas.

6-B. Flood of Global Capital

The decade-long global economic boom also means that world capital markets are awash in cash. For the group of oil-exporting countries, including OPEC, oil export revenue rose from US $262 billion in 2002 to US $614 billion in 2005, equivalent to an extra 40% of pre-boom GDP for the oil exporters (International Monetary Fund, 2006). In 2008, the value of oil exports of OPEC alone are expected to grow 45% to $980 billion amid record high crude oil prices, according to the U.S. Energy Information Administration. Furthermore, by 2006, Middle Eastern private investors were keeping an increasingly larger share of assets onshore, 25% vs. 15% in 2002 (OnWallStreet, 2008). Clearly, hundreds of millions of these petrodollars will continue to be invested in the region's booming real estate market.

But while a larger share of oil revenues may be staying at home in the Gulf, a significant amount is still left over for investment elsewhere throughout the world. Specifically, McKinsey estimates that as much as US $250 billion will be directed toward investments in Asia by 2011. Conversely, what once was perhaps a trickle from Asia is now a flood, with trade and investment flowing into the Middle East (Trade Arabia, 2006) as China searches to invest its billions in manufacturing export revenue. And capital from both China and the Middle East will continue to fuel the ambitious growth plans of smaller countries such as Morocco, Malaysia, and Vietnam.

Not all capital inflows come directly from oil, however. The late Sheikh Zayed decreed that "not one grain of sand" in Abu Dhabi would ever be owned by a foreigner (AMEinfo, 2007). But now, property developers ALDAR and Sorouh have both increased their allowable foreign stock ownership to 40%. And recent launches of mega resort developments in the Dubai and Abu Dhabi have seen huge foreign purchases, made possible by new legislation on property ownership by non-nationals, thus paving the way for tremendous inflows of capital at the individual investor level.

6-C. Economic Development

Clearly, the recent rush of city building is a reaction to rapid economic growth and resulting urbanization, as is occurring in China. In some cases, however, city building is a proactive tool for economic growth, as is the case in the United Arab Emirates. Future-looking oil rich countries are facing the reality of finite carbon based resources and thus implementing strategies for economic diversification to help them grow for the next 100 years and beyond.

Dubai is one such example. As Sheikh Ahmed bin Saeed al-Maktoum, Chairman of the US $33 billion Dubai World City development explains, "We had to diversify our economy because Dubai has limited resources. We are a part of the Gulf that has a lot of oil, but Dubai itself has very small quantities of it. We had the idea to develop tourism and it all started at that time, thinking about the future." (TimesOnline, 2007). It is clear from its many mega scale leisure, shopping and entertainment projects, from Dubailand

Satellite view of Dubai's growth, 1973 (Source: Nakheel)

Satellite view of Dubai's growth, 1990 (Source: Nakheel)

Satellite view of Dubai's growth, 2006 (Source: Nakheel)

Satellite view of Dubai's planned growth (Source: Nakheel)

to the Meydan Equestrian City, that Dubai intends to be the hub of Middle East tourism. Dubai's ambitions also include being the center of finance, transit, distribution and manufacturing for the region, if not the world. Its growth up to this point is extraordinary.

Smaller, but no less ambitious countries also see the opportunity in broadening their economies by creating new business categories where none previously existed. Speaking about Tunisia's new Tunis Finance Harbor development, the chairman of Gulf Finance House states that the country will "benefit from developing its offshore financial services industry and creating a world-class International Financial Centre for North Africa," and also that "the project will make a significant contribution to the Tunisian economy in the long term and be seen as a strategic component of Tunisia's economic infrastructure." Korea is following a similar strategy by including in its new Millennium City the Seoul Digital Media City, to "develop a futuristic info-media industrial complex that will serve as a center of information technology in northeast Asia" (DMC).

6-D. Image Building and Modernization

Whether proactive or reactive, it is immediately apparent from reading the marketing materials and press releases from these developments that government leaders are proposing, endorsing, and even financing megacity building projects as a means to gain international respect and project an image of modernity to the rest of the world. The Web site for Nusajaya, a 97 square kilometer new city in South Johor, Malaysia not only announces that "being a part of Nusajaya is being a part of the best the world has to

offer," but that it "raises the bar for all integrated developments around the globe." The US $2 billion Phnom Penh New Town in Cambodia, promises "successful international business opportunities with the global standard of the city," and the US $1 billion Ajman Marina will allow the Emirate of Ajman "to take a giant leap into 21st century" (Maktoob Business, 2007).

Perhaps the best example of both global image building and modernization is China, which in advance of the 2008 summer Olympics in Beijing "has given itself an urban facelift that includes skyscrapers and sports stadiums, a new third terminal in Beijing's International airport, bigger park space and a more expansive subway system—ingredients for a modern metropolis" (Wall Street Journal, 2008). The monumental urban redevelopment allows the government to make the point to the world that Beijing is the showplace of a modern economic superpower (New York Daily News, 2008).

6-E. Globalization of Knowledge Capital

Just as financial capital has become global, so has knowledge capital. In 2006, the number of Chinese students granted U.S. visas rose 25% to 20,244, more than 61,000 students in American universities, more than any country except India. As one student so astutely commented, "The U.S. has a rich source of creative ideas and high-tech" (USA Today, 2006). India is the leader in international educational exchange, with over 123,000 students studying outside the country, with more than 76,000 of them in the United States, a trend that continues to shape and impact the cultural, economic and diplomatic dialogue between the two countries (Forbes, 2007).

But now, while continuing to import students, established educational institutions are directly exporting their programming. Dubai Real Estate Institute (DREI), the region's first academic institute for real estate studies, has a partnership with the UK's University of Reading Department of Real Estate and Planning to offer in Dubai executive education programs and training in real estate. The UK's Heriot-Watt University, whose Dubai campus was established in 2005, has announced the region's first master's course in real estate, which will be accredited by the Royal Institute of Chartered Surveyors (RICS). The transfer of established Western real estate industry practices is inevitable, considering such educational partnerships.

This cross border knowledge transfer enables global standardization of real estate product and its delivery. Advanced technology is the enabler, allowing modern design and engineering practices, specifications and standards, construction processes, and even marketing and sales practices, to be exported to any country, no matter how remote. The exchange continues beyond the education level, as is evident with the numerous international partnerships between developers, architects, builders and other specialists from all parts of the world. A few examples include:

- *Bahrain Bay (Bahrain)* - CapitaLand (Singapore), SOM (US), government of Bahrain
- *Bidadi Knowledge City (India)* – Calthorpe (US), Limitless (Dubai), DLF (India)
- *Odyssey Science City (India)* - Springfield Land (Australia), Jurong Group (Singapore), government of Bangalore

- *Nusajaya International City (Singapore)* - Mubadala (Abu Dhabi), Kuwait Finance House (Kuwait), ALDAR (Abu Dhabi)
- *New Songdo City(Korea)* - Gale Company (US), Posco Engineering and Construction (Korea), Kohn Pederson Fox (US)
- *Zayed, Paris-Sorbonne, and New York Universities (Abu Dhabi)* – Mubadala (Abu Dhabi), John Buck Company (US)

These examples, and dozens like them, indicate that for master developers the market is truly global, and thus standardizing professional practices allows these firms to both accelerate and optimize the real estate development process.

6-F. Change in Property Ownership Laws

Lastly, critical changes to property ownership law have dramatically altered the real estate industry in rapidly developing countries. Until the mid 1990s, China's 1.3-billion people lived in state-owned property, but the Chinese government decided to get out of the public housing business, allowing people to buy their apartments at a significant discount, thus creating a real estate market where there had been none before. With China's growing economy creating higher-paying jobs, these new homeowners promptly began trading up into better quality housing. State-owned banks made the process easier in 1997, by introducing consumer mortgages at below market interest rates. By mid 2008, they had handed out nearly US $490 billion in home loans (Financial Times, 2009). Speculators, domestic and foreign, were also drawn to China's property market for the same reasons many Americans put their money into real estate in recent years—it was an

attractive alternative to an unreliable stock market. A 2005 survey found that about a third of the buyers of high-end Shanghai properties were investors (St. Petersburg Times, 2005), further fueling demand for residential property.

Similar changes were initiated in the UAE, where non Gulf Coast Country expats living in the Emirates were previously only permitted to own property under the federal law approving a 99-year leasehold basis. This changed in 2002, however, when the Dubai government permitted the outright ownership of freehold property, contributing to the current real estate boom. Like China, mortgage lending also contributing to demand, which more than doubled by 2007. By the end of that year it totaled US $16.02 billion, compared with US $8.4 billion a year earlier (Arabian Business, 2008). Comparable land reforms are beginning to take place elsewhere in the developing world, which will similarly increase demand for real estate.

Many concurrent factors, then, have aligned to create an environment ideally suited for the recent burst of megacity development. The flood of global capital enables economic development that is based upon urbanization and global political aspirations, while global knowledge transfers and changing property laws ensure that real estate markets become standardized, thus attracting even more capital. This standardization is not assured, however, as the influence of these multiple factors varies from country to country. Nevertheless, three general market models emerge from the research and are further defined in the following section.

7. Three Market Models

In the course of researching new megacities—where and how they're being built, and the different entities involved in developing them—three different real estate market models begin to emerge, each with their own unique characteristics, reflective of the cultures in which they exist. The ***Established Market*** model is familiar from existing Western cities, the ***Transitional Market*** model can be observed in Asia, as the centrally controlled economies give way to capitalism, and ***New Markets*** are being shaped where none previously existed, primarily in the Middle East. Each of the market models is summarized in Table 4, and further examined below.

Table 4 – Three Market Models

Three Market Models			
	Established Market	**Transitional Market**	**New Market**
Market driver	demand	demand	supply
Project Size	small, medium	medium, large	medium, large
Master Plans	government, developers	government	master developers
Land Acquisition	open market	from government	from government
Speed of Development	slow	medium, fast	fast
Market for stabilized assets	mature	immature	virtually none

7-A. Established Market Model

- Industry driven primarily by market demand, with periodic supply driven booms
- Combination of modestly scaled greenfield development and urban redevelopment
- Master plans typically generated by government entity
- Acquisitions usually conducted in the open market by private and public firms
- Large national firms coexist with regional, local players
- Established, institutionalized market in stabilized assets
- Long development schedules

The established real estate markets of Western countries have a long history of growth and contraction cycles that follow the general economy, and until recently functioned with relative efficiently and transparency. Because Western countries face anemic economic growth and negative population growth, the scale of real estate development is relatively modest, aside from a few large City in the City urban redevelopment projects such as Liverpool Waters in the UK and Atlantic Yards in Brooklyn, New York.

Historically, these markets have been able to mature through the adoption of stabilizing regulation, established property law and a democratic legal system. Real estate in established economies is bought, sold, and developed within a free market environment by national, regional and local real estate firms, with infrequent and minimal financial assistance from government agencies. It is this predictability of the market that allows

real estate to become a financial vehicle, creating an active and significant secondary market for trading existing real estate assets.

Zoning codes, while stabilizing, can also make the development process costly and time consuming. Columbus Center, a mixed-use development in Boston, went through 11 years of permitting and neighborhood opposition, during which time project costs nearly tripled (The Boston Globe, 2008). But it is these and other regulations that allow government agencies to manage long-term growth and opportunity, by ensuring that real estate markets remain stable and predictable for individual entrepreneurs and public companies.

7-B. Transitional Market Model

- Real estate development driven primarily by demand resulting from overall economic growth (demand pull), with indirect supply push effects
- Equal amounts of large-scale urban infill and greenfield development
- Government directs massive clearings on behalf of private developers
- Master developer/planner is typically government entity
- Development in turn done by private and public companies, often in partnership with government officials
- Master developers are usually large, multi function general developers
- Untested market for stabilized assets
- Short development schedules

Transitional markets, which are most apparent in India and Asia, are driven both by massive population shifts resulting from urbanization and substantial financial liquidity resulting from recent rapid economic growth. In its race to provide housing and exploit the overwhelming demand of the growing and newly affluent population, China's broader real estate development industry, for example, does indeed push supply into the market, but it appears to be more a response to existing consumer demand than the urgent need to deploy capital. Simultaneously, the economic boom fuels demand for commercial, industrial and office property as well. At the current rate of growth, China's cities will need to build 40 billion square meters of new floor space in residential and commercial buildings by 2025 (McKinsey, 2008).

The legacy of central government planning, such as that by the Communist Party in China, means that in most cases local, regional, or national governments already own the land upon which new development take place, and as such are empowered to act as master developers, which in some cases they do with reckless abandon. The most profound example of government as master developer is Beijing, where in preparation for the 2008 Olympics an urban redevelopment of the central city is taking place on a scale previously unknown to developing countries. When complete, China's capital city will be home to a dozen new competition venues, 17 miles of new subway lines, and US $40 billion in other real estate investment (Fortune, 2008), all made possible through the government's authority to raze neighborhoods and relocate residents.

In countless other cities throughout Asia it is the government that controls the land, releasing parcels to preferred developers according to larger master plans. Such projects as the proposed eco-cites of Tianjin, Wanzhuang, and Dongtan China; the new urban district at Thu Thiem in Vietnam; the city center redevelopments of Chongqing and Shenzhen; the redevelopment of Nusajaya at South Johor, Malaysia; all are controlled at some level by a specific government official or agency, that grants authority to developer partners.

As real estate markets in Asia mature, an emerging market for institutional investment is beginning to form. One early participant is GE Real Estate, which in 2006 funded with US $20 million a new CITIC Capital/Vanke China Property Development Fund. This fund plans to invest a total of US $100-150 million in residential real estate assets in specified economically developed regions in China. In fact, China Venture News reports that foreign private equity was involved in 31 separate real estate investments in China in 2006, and by the first quarter of 2007, real estate was the largest investment sector for private equity in China, indicating the emergence of a structured market for real estate asset transactions.

7-C. New Market Model

- Industry driven primarily by supply (supply push)
- Mostly very large-scale greenfield development
- Land awarded to private developers by government entity, in-kind or by auction
- Master plans usually developed by professional firms hired by Master Developers

- Largest master developers are either private or semi-private, relatively new firms
- Numerous sub-developers, newly formed, who buy parcels of land from Master Developers
- Strategy of building new industries to broaden economic base
- Heavy reliance on land and bulk re-sales
- Untested market for stabilized assets
- Short development schedules

Real estate development in the New Market model is driven primarily by immense financial liquidity resulting from the recent boom in oil markets, and the urgency to diversify the economy away from one based on petroleum. Thus the new economy, primed with petrodollars, has as its foundation a frenetic real estate development and construction industry, furiously pushing new offerings of all product types into the market. The longer-term strategy is one that uses new oil revenues to diversify the region's economy, create jobs, and make the Arab States the world's economic superpower (Brookings, 2008).

The Middle East has a seemingly endless supply of land, most of which is in the hands of various individual Heads of State. In the case of Dubai, responsibility for partitioning and awarding the Emirate's 4,100 square kilometers of land falls to the Dubai Lands and Properties Department, which regularly auctions state owned land to private developers. In December 2005, the agency set a single-week record of US $275 million in land sales.

According to UAE Property Trends, the combined value of land sales—initial and sub-divided—in Dubai in February 2008 reached US $2.03 billion.

The large tracts are sold primarily to master developers such as Emaar and Dubai Properties (see Table 3), and are then typically master planned, sub-divided and re-auctioned to sub-developer partners (see Appendix 5), who actually build the projects. Land sales were responsible for the impressive 75% year-over-year revenue growth rate for Abu Dhabi's Sorouh Real Estate, a company only formed in 2005. And it was primarily rapid apartment sales turnover across various master developments (The National, 2008) that allowed Deyaar, a five-year-old sub-developer based in Dubai, to recently report a 180% increase in profits. In some cases the government stays involved as a partner with the developer. At the Knowledge Economic City in Medina, the King Abdullah bin Abdulaziz Foundation for the Development of Housing owns the land upon which housing is proposed, and under its agreement with developer Seera, it will receive a portion of the city's returns, which will then be re-invested in public housing across the kingdom (The Middle East, 2007).

Impatience on behalf of developers, limited regulation, and easy access to capital ensures that projects get built far more quickly than in Established Markets. The average time to develop cities listed in the Megacity Survey is ten years. But generally, real estate economies in New Markets are quite immature, with many newly formed firms, and little or no history of transactions in stabilized commercial assets, which explains why few Western real estate equity funds have positions in Emirates real estate.

These models are by no means rigid. With global markets awash in capital, Established Markets in the US and UK recently behaved like New Markets, driven entirely by supply. And some mega developments in New Markets adhere to Established Market real estate fundamentals more closely than others. India, for example, is in many respects a New Market, yet it has an underlying economic system grounded in the legacy of British, and thereby established western markets. Nevertheless, the real estate development process remains similar throughout, even though the concepts, plans and execution of the megacities in the survey vary widely in response to the market model. The next thesis section looks more closely at three specific megacity development projects, each in a different country, of varying scale, and with a different type and theme.

8. Case Studies

To better understand the various megacity types, themes and underlying market models outlined in previous sections, it is useful to look more closely at specific cities included in the survey. In this section we consider three specific examples. In choosing these cities it is my intention to present a diverse offering—Downtown Jebel Ali in Dubai is a Satellite City with a Lifestyle theme, King Abdullah Economic City in Saudi Arabia is a New Metropolis with and Economic theme, and Tianjin Eco-City in China is a City in a City with en Environmental theme. These examples also have a range of sizes, by population from 70,000 to 2,000,000, by land area from 2 sq km to 168 sq km, and by cost from $US7 billion to $US 27 billion. Yet, by our previous definition, each is considered a megacity.

8-A. Case Study 1 – Downtown Jebel Ali

Downtown Jebel Ali	
Location: Dubai, UAE Theme: New Urban District Developer: Limitless	Size: 2 sq km Cost: US $13.6 billion Population: 70,000 Type: Satellite City Theme: Lifestyle

Project Overview

Stretching beside Sheikh Zayed Road and covering over 6.2 square kilometers, Downtown Jebel Ali creates an 11 kilometer long, new mixed-use central business district along the major road artery between Dubai and Abu Dhabi. It is located south from the Dubai Waterfront and the Port of Dubai, and lies between the Jebel Ali Free

Locational map, Downtown Jebel Ali (Source: Nakheel)

Zone (JAFZA), and the new Al Maktoum International Airport further inland. According to master developer Limitless, Downtown Jebel Ali's size and mix of commercial, leisure and residential buildings will make it a compelling destination in its own right.

First announced in November 2006, Downtown Jebel Ali is expected to have total built area of 70 million square feet, with total employment of approximately 165,000 people, and be home to 70,000 residents. Expected completion is 2011, at cost of US $13 billion

Masterplan Features

The development consists of four quarters - East Quarter, East Central, West Central and West Quarter--with a total of 326 buildings, 237 of which will be residential. Each quarter is divided into three individual districts that include business, residential, shopping, dining and entertainment uses.

The Urban Centers have modern towers and grand covered spaces. They provide the commercial and social hub of each zone. In addition to Class A office and residential, cafes, restaurants and shops give each of the zones a distinct and vibrant character and create a comfortable, lively environment, day and night.

The Trellis Districts extend out from the Urban Center and make a distinct change in theme and density. With a blend of smaller towers and mid-rise buildings, the Trellis District has the strong visual identity of a unique network of trellises projecting from buildings to provide shaded, pedestrian-friendly passage. These shaded interior roads

with wide sidewalks and ground floor shops are interspersed with urban plazas and parks that include plants and water features to create a more natural environment

The Medina Districts are designed to 'resonate with echoes of historic desert cities while offering every modern amenity.' In these mainly mid and low rise residential neighborhoods lying beyond the Trellis Districts, small courtyards and plazas are punctuated by cafes and local shops, while cars are kept largely to the perimeter, allowing meandering cobblestone streets and walkways to create a more intimate, human scaled environment. Compact neighborhood parks mark the entry to each Medina and provide yet another place for people to meet and socialize.

The Four Quarters

East Quarter - Heading west on Sheikh Zayed Road from the Dubai City Center, East Quarter marks the eastern gateway to Downtown Jebel Ali. Accessed from Interchange 8 of the freeway, East Quarter is 1.1 square kilometers. A Metro station will be centrally located beside Sheikh Zayed Road, leading directly into the Urban Center. To the west the Urban Center leads to the Trellis District and then to the Medina District, which dominates the western end of the quarter.

East Central Quarter - Next along Sheikh Zayed Road is East Central, measuring approximately .92 square kilometer. This quarter is more centrally located between freeway interchanges 9 and 10 and is easily reached from both JAFZA North and JAFZA south. As with East Quarter, a centrally located Metro station opens into a plaza in the

heart of the Urban Center. Trellis Districts and finally Medina Districts are situated at each end of the quarter.

Downtown Jebel Ali Plan (Source: Bovis Lend Lease)

West Central Quarter - Situated between freeway interchanges 10 and 11 and to the north of Techno Park, West Central is the second largest of the quarters, with an area of 2.1 square kilometers. Like East Central, West Central's layout follows the pattern of a centrally located Metro station leading through to the Urban Center, flanked by Trellis Districts, which themselves transition into Medina Districts.

West Quarter – As the name suggests, West Quarter is the most westerly of the quarters, and also the largest, with an area of 2.2 square kilometers. West Quarter has a similar arrangement to the other quarters, with a Metro station and Urban Center. However, while the Urban Center transitions to Trellis and Medina Districts to the east, the western end of the quarter turns back on itself, forming a distinctive 'elbow' in the overall shape of Downtown Jebel Ali.

Infrastructure

Downtown Jebel Ali is located at the intersection of four new freeways allowing easy access by car, however, traffic on the site will be intelligently controlled to enhance efficiency and reduce congestion. Additionally, there will be a state-of-the-art internal people mover system to provide an environmentally friendly, practical and comfortable way to move throughout the four quarters. More importantly, centrally located in each quarter will be a Dubai Metro station to carry people between each and other parts of Dubai.

Development

Master developer Limitless is wholly owned subsidiary of Dubai World, one of Dubai's largest conglomerates. Set up in 2005 as a government LLC, Limitless currently has $100 billion in real estate under development, including such high profile projects as Downtown Jebel Ali, the Arabian Canal, Al Wasl in Saudi Arabia, Halong Star in Vietnam, and the International Halal Park in Malaysia.

As master developer of Downtown Jebel Ali, Limitless is responsible for executing the entire project. While it plans to develop 20% of the site itself, building 35 towers, Limitless has also successfully sold off parcels of land to other project level developers, who will build out these sites according to the master plan. Limitless expects to spend US $1.3 billion to build the city's underlying infrastructure.

In December of 2006 and only one month after announcing the project, Limitless announced that available parcels in the East and East Central Quarters of Downtown Jebel Ali were entirely sold out to local and international developers. By March 2007, they announced that 70% of the project was sold. A number of projects are being done by sub-developers throughout Downtown Jebel Ali:

- *Al Mazaya Holding (Kuwait)* - a regional property developer developing nine plots, a commercial tower in East Quarter, and eight other buildings in West Quarter.

- *Deyaar (Dubai)* - building Deyaar Park on eight consecutive parcels in West Central Quarter that will include eight residential and commercial towers.

Deyaar Park (Source: Deyaar)

- *DAMAC Properties (Dubai)* - building Suburbia (residential) in East Quarter, which will be comprised of two towers surrounded by townhouses, Parkside (residential) in West Quarter, Central Square (residential), and Capital Square (office).

Suburbia (Source: DAMAC)

Capital Square (Source: DAMAC)

Parkside (Source: DAMAC)

Central Square (Source: DAMAC)

- *Cirrus Developments (Dubai)* – developing a twin tower mixed-use building called Sienna Square in West Quarter, including office and residential. Also Celestial Heights, a three tower (named Polaris, Capella, and Orion) mixed-use development in East Quarter.

- *Schon Properties (Dubai)* - building The Signet, a residential live-work midrise in West Central Quarter, one of the first residential buildings endorsed with a Jebel

Ali Free Zone Authority License for home office usage. Schon also recently launched Schon Suites, a condo-hotel.

The Signet (Source: Schon Properties)

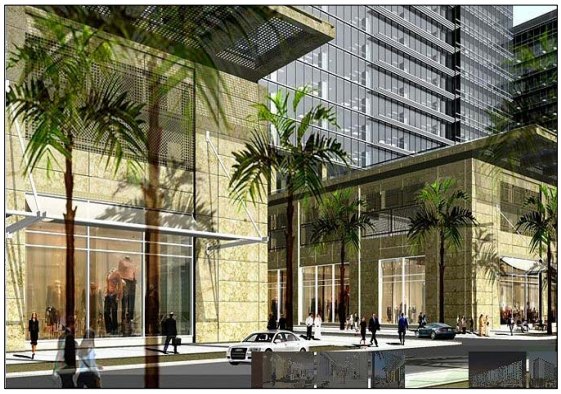
Schon Suites (Source: Schon Properties)

- *Al Fara'a Properties (Dubai)* – developing a twin residential tower called Image Residences, planned for the Medina district of Central West Quarter. Announced in May 2008, phase one of the project sold out in two days.

Image Residences (Source: SkyScraperCity.com)

- *Maison Limited (Hong Kong)* - building the 'Maison Residence Collection,' a mixed-use residential and hotel tower in West Quarter.

- *Limitless (Dubai)* - recently completed four Class A office buildings in East Quarter. The 16 story buildings form the first part of a group of eight buildings called Infinity Place and feature 14,500 square foot floor plates.

Infinity Place (Source: Limitless)


Infinity Place, under construction (Source: SkyScraperCity.com)


Limitless Proposed Mixed-use, Downtown Jebel Ali (Source: PEI Partnership Architects)

- *Limitless (Dubai)* – building the Plazas, two transport, entertainment and retail hubs that include a Dubai Metro station and a pick-up and drop-off point for the development's internal transport system. The Plazas will be a regional venue for shopping and entertainment, with a multipurpose outdoor arena for concerts, cultural and sporting events, as well as restaurants and cafés. Residential and office accommodation will also be included.

- *Rufi Development (Dubai)* – building Royale Residence in West Central Quarter.

Royale Residence (Source: Rufi Development)

Summary

Downtown Jebel Ali is a Satellite City, on the outskirts of the existing Dubai metropolitan region. In time, however, it may become a City in the City, as the nascent Jebel Ali Free Zone to the north and new Dubai World City, including the new Dubai International Airport, to the south are fully developed. Its theme is Lifestyle, with a variety of residential offerings for 70,000 residents, mostly service retail, leisure facilities and commercial uses, including office, for an estimated 165,000. With expected completion in 2011, infrastructure and a number of buildings are under construction.

8-B. Case Study 2 – King Abdullah Economic City

King Abdullah Economic City (KAEC)	
Location: Jeddah, Saudi Arabia Theme: New Metropolis Developer: Emaar, Aseer, Bin Ladin	Size: 168 sq km Cost: US $26.7 billion Population: 2,000,000 Type: New Metropolis Theme: Economic

Project Overview

The largest private sector investment in the Kingdom of Saudi Arabia is the King Abdullah Economic City (KAEC), a megacity that will lead Saudi Arabia's drive for economic diversification and expansion. It is one of six new economic cities proposed for the Kingdom. Announced in 2005, the new multifaceted economic hub at KAEC is

Proposed Economic Cities (Source: Strategic Forecasting, Inc.)

being developed by Dubai-based Emaar Properties in collaboration with investment company Aseer Trading, and Binladen Group of Saudi Arabia, and in partnership with the Saudi Arabia General Investment Authority. The joint venture is called Emaar, the Economic City.

The city occupies 167 square kilometers along the western coast of Saudi Arabia at Rabigh, north of Jeddah. When complete, it will employ 2,000,000 people, and be home to 1,000,000 residents. Expected completion is 2028, at cost of US $26.7 billion.

Masterplan Features

KAEC has six major components—a central business district (CBD) including commercial, mixed-use, retail and financial island, a 14 square kilometer seaport, a 63 square kilometer industrial zone, 22,500 resort hotel rooms, a residential area with 169,000 high-rise housing units and 42,000 villas, and an education zone. Retail uses are spread throughout, covering 8.7 million square meters with over 50,000 shops.

Source: Emaar, the Economic City

Components include shopping malls, town centers, neighborhood malls and street shops. There will also be 550 mosques, five yacht clubs and one 45,000 seat sports stadium.

The Central Business District (CBD) totals about 40.9 million square feet of Class A office, hotel and other mixed-use commercial space. The core CBD is to the right side of the blue shaded are in the diagram, while the left is the remainder of the central city. *Financial Island*, within the CBD, will provide the biggest regional base for the world's

Source: Emaar, the Economic City

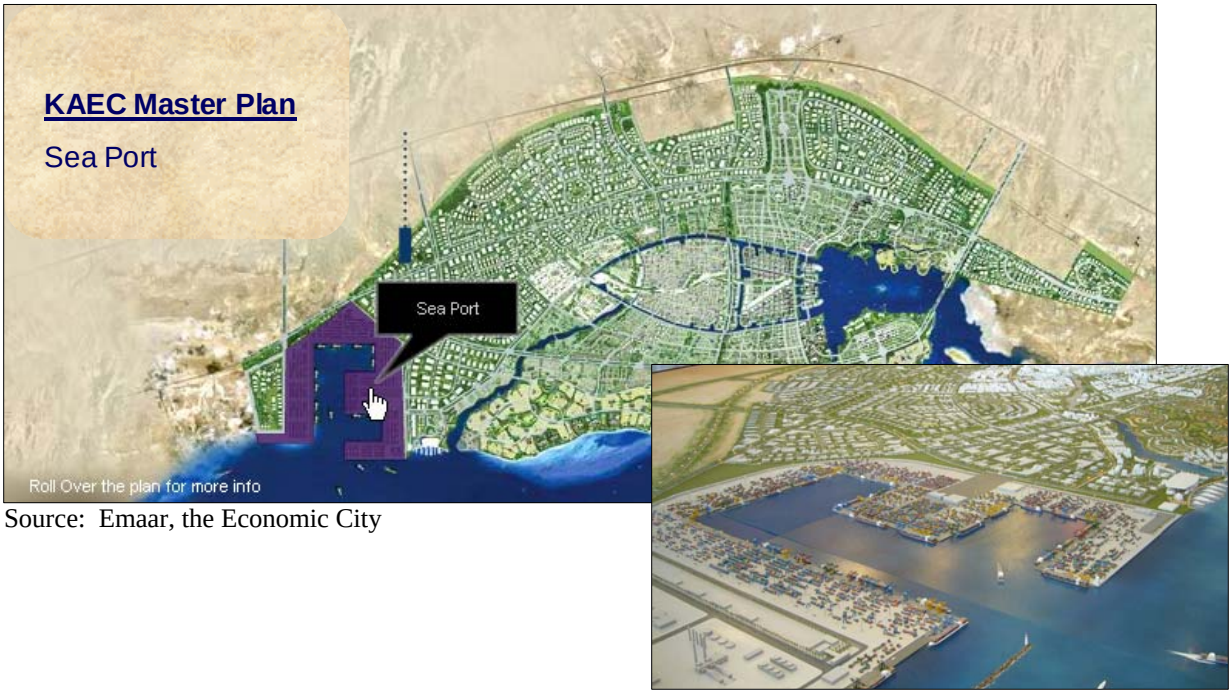

View of the KAEC CBD (Source: Emaar, the Economic City)

leading banks, investment houses and insurance groups, with 18 million square meters of built space and including a 125 story iconic office tower.

KAEC Central Business District (Source: Emaar, the Economic City)

The Seaport will be the largest in the region, designed to serve global trade routes between east and west, and set to become the one of the largest ports by traffic and capacity. It will have 30 container berths, each large enough to handle Panamax class vessels, and will be the western terminus of the Saudi land bridge that creates a direct rail and road link between the Red Sea and the Arabian Gulf coast. The Sea Port will be integrated with the Industrial Zone and logistics hub to provide a seamless logistics operation within KAEC that will further promote regional trade. The port, with its close

proximity to the two Holy Cities of Makkah and Medina, will also have a dedicated Hajj terminal to 300,000 people during their pilgrimage.



Source: Emaar, the Economic City

The Industrial Zone covers 63 square kilometers, roughly a third of the KAEC's total area, and will be dedicated to industrial and light-manufacturing facilities, identified as

Source: Emaar, the Economic City

key growth drivers for the Saudi economy--in particular, downstream petrochemicals. The Industrial Zone can support 2,700 tenants, encourage local entrepreneurs through incubator-like programs, and enforce guidelines to ensure best environmental practices. More than 800,000 square meters of land were leased by 2007.

Residential areas will be spread throughout the city, with total development in excess of 150,000 units. The bulk is allocated to 108,000 apartments in low-rise buildings, with a further 56,000 in mid and high rise buildings. 5,000 premium apartment residences will be located in the towers of the CBD. Single family housing includes 10,000 two story

Source: Emaar, the Economic City

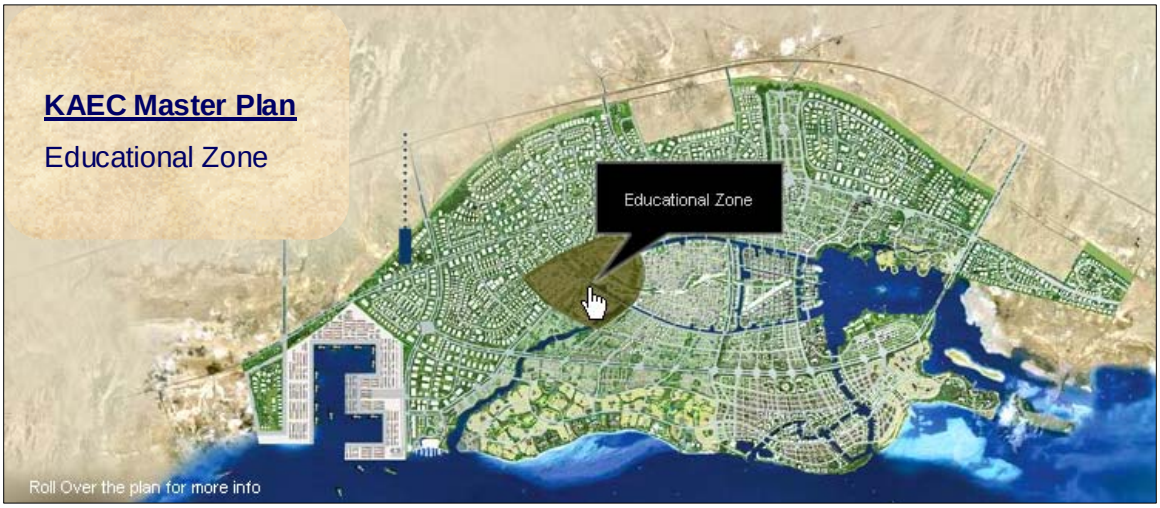
townhouses and 32,000 waterfront villas, some with private docks. There are three designated residential areas: Town Center (mid rise and retail), the Corniche (at the marina), and the Waterfront Villas

The Sea Resort lies along a 2.5 kilometer stretch of pristine Red Sea beachfront. New themed resorts and boutique hotels will add a planned 25,000 suites, rooms and serviced apartments. It includes facilities for golf and equestrian activities.

Source: Emaar, the Economic City

Sea Resort (Source: HOK)

The Education Zone is designed to house a world-class educational system, including a system to deliver quality, high performance primary and secondary schools. The Zone also includes a multi university campus for 18,000 students, with partners Thunderbird Middle East University and Columbia University, flanked by two research and development parks. An expected 7,500 faculty and staff will focus on new economy industries, such as information technology, pharmacology, and medicine, which will be supported by its own teaching hospital.



Source: Emaar, the Economic City

Infrastructure

KAEC is built entirely on undeveloped land, far from any established city. Thus, it requires the construction of all infrastructure necessary to support a growing city, including roads, water, sewer and electric. Huta Group, part of Saudi Binladen, will construct 3.5 kilometers of water canals throughout the city before the end of 2008. SETE Energy Saudia will build a 70,000 cubic meter per day sea water reverse osmosis desalination plant, sufficient to meet the water requirements for the first phase of KAEC including the Industrial Zone, Residential Communities and Resorts. Arabian BEMCO Contracting Company will install a six-turbine, open-cycle gas power plant to meet the power requirements of the first phase of KAEC, with Siemens under agreement to construct the citywide power grid. With input from MIT's 'Smart City' initiative (Arabian Business, 2007), Cisco will install the citywide IT infrastructure (Reuters, 2008).

Development

Emaar Properties it the world's largest publicly traded property developer with a market capitalization of US $25 billion. It was established in 1997 as a public joint stock company with initial capital of US $274 million and in 2000 it listed on the Dubai stock exchange. The Dubai government retains a 32% equity stake in the firm (theemiratesnetwork.com, 2008). Master developer Emaar has itself been developing most of the initial stages of the KAEC project, although it is beginning to sign agreements with individual sub developer partners, carving off portions of the project for separate development:

New KAEC entrance and Sales Center (Source: Emaar, the Economic City)

- *Emaar (Dubai)* – is developer of Bay La Sun Boulevard Towers, a cluster of eight stand-alone residential towers offering 532 homes along Bay La Sun Boulevard. Spread over 2.3 sq km, Bay La Sun Village is an integrated, mixed-use project that comprises residential apartments, offices, schools, retail shops, shopping mall, hospital, mosques, hotels, civic amenities, and other attractions.

Bay Las Sun Master Plan (Source: Bay La Sun)

- *Emaar (Dubai)* – is developing Esmeralda, a suburban golf and housing project within the gated community of Resort Cove. Esmeralda features over 2,000 villas and clustered townhouses adjacent to a world-class 18-hole golf course. The community also features an exclusive town center, clubhouse and several retail and leisure outlets. Also includes a beachfront Ritz Carlton Hotel resort.

Bay La Sun villa construction (Source: Bay La Sun)

- *Saudi Bin Laden Group* - will build 16 luxury residential towers with all supporting services and facilities within the Bay La Sun community. These 10 story buildings will contain over 1,000 units and parking for 1,700 cars. There are available to Saudis, Gulf Coast nationals and foreign investors.

Bay La Sun Boulevard Towers (Source: Emaar, the Economic City)

- *Saudi Oger* – will undertake construction of four residential towers, comprising 616 apartments. The contract also covers the construction of roads, parking areas and landscaping.

Bay La Sun Residential (Source: Bay La Sun)

- *Freyssinet Saudi Arabia* – will design construct various facilities within the Bay La Sun area. Work has begun on the first phase of the residential component known as Bay La Sun Village, as well as phase one of the Business Park. When completed, the five-building Business Park will cover a total area of 258,000 square meters and feature Class A office buildings, underground parking, a day care center, restaurants and waterfront shops. One building will be for the exclusive use of the Saudi Arabian General Investment Authority (SAGIA) and the other will be partially occupied by Emaar.

Freyssinet Red Sea Village Business Park

Red Sea Village Business Park (Source: AMEinfo)

- *Capri Capital Partners (USA)* - will build a US $2 billion, 200,000 square meter mixed-use project that features two 300-key luxury hotels, office towers, a retail center, two condominium towers, and a convention center and adjoining hotel. The development combines commercial and residential properties and is located in the CBD of a new city. Capri is the first international real estate investment company to invest in and oversee development within KAEC.

- *DP World (Dubai)* – the global marine terminal operator will build, own and operate the city's planned multi-purpose cargo port. KAEC Sea Port is the first port in the Kingdom to be completely financed by the private sector.

- *Global Educational Management Systems (Dubai)* – will establish schools accommodating 2,000 students, designed to provide 'international standards of education.'

Financing

Emaar the Economic City, the development entity for KAEC underwent an IPO in July, 2006, floating a 30% equity stake to help fund the project. The IPO was expected to raise US $693 million, however, in spite of being open only to Saudi nationals, the sale was 2.8 times oversubscribed, 850 million shares were sold, and US $1.8 billion were raised. Emaar announced in July 2008 that sales of residential property at KAEC have reached US $267 million.

Summary

KAEC is a New Metropolis, located at Rabigh, north of Jeddah along the western Saudi Arabian coast. It is one of the largest megacities surveyed, with land area of 168 sq km, expected population of 2,000,000 and employment of 1,000,000, and an expected cost of $US 26.7 billion. It will be built on mostly undeveloped land, with a full range of uses, including a complete spectrum of office, industrial and production, local and regional retail, single family and multifamily housing, entertainment, sports, education and religious. It will also have skyscrapers as well as low rise office parks and residential suburbs.

Its theme is Economic, intended to create entirely new industries, thus expanding the breadth of the Saudi economy, growing the employment opportunities for a rapidly expanding population, and supplementing the existing oil based economy. With expected completion in 2028, infrastructure and a number of buildings are currently under construction.

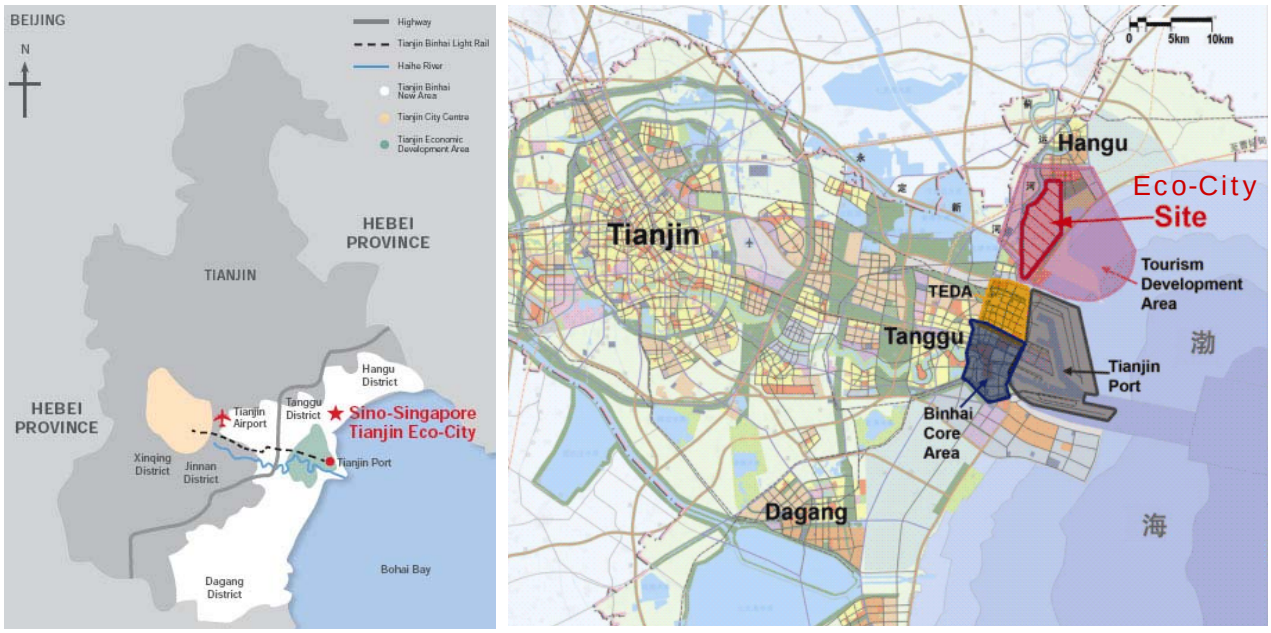
8-C. Case Study 3 – Tianjin Eco-City

Tianjin Eco-City	
Location: Tianjin, China Theme: Environmental City Developer: Keppel Corp., TEDA	Size: 30 sq km Cost: US $7.1 billion Population: 350,000 Type: City in a City Theme: Environmental

Project Overview

The idea for Tianjin Eco-City was first presented by the Senior Minister of Singapore during a meeting with China's Premier in Beijing in 2007. This would be the second large-scale development collaboration between Singapore since the Suzhou Industrial Park in 1994.

The 30 square kilometer Eco-City site is located 40 kilometers from the Tianjin City center and 150 kilometers from Beijing. Besides preservation and restoration of the natural ecology on the site, the goal of the venture is to develop a new city that is environmentally friendly, sustainable, and socially responsible. Eco-City aspires to embody the latest thinking in strategic urban planning: dense mixed-use development, respect for the ecological infrastructure, use of renewable resources, reuse of waste and wastewater, recycling, and 'smart' transit planning. The venture does not aim for the ultimate goal of zero carbon emission or 100% recycling, but it otherwise has high expectations.



Eco-City is not only intends to be a showcase for sustainable development, but also a template for Chinese cities struggling to balance rapid economic growth with environmental protection. Given the political prestige and economic potential involved, it was no surprise that dozens of Chinese cities lobbied intensely to host the new project. Beijing officials narrowed the choice to four sites: Tianjin; Caofeidian Industrial Park in northern Hebei province's Tangshan City; Baotou City, an industrial base in Inner Mongolia; and Urumqi, capital city of Western Xinjiang Province. The list was based on a number of conditions—that the site not be on agricultural land, and that it be in an area where water is scarce; that it be in proximity to a central city, to save on infrastructure costs. The project was ultimately awarded to Tianjin in November 2007. Remarkably, the master plan was approved five months later in April 2008.

With an anticipated development time of 10-15 years and an expected cost of US $7.1, Eco-City will house up to 350,000 residents when finished. Government officials hope

that Eco-City will be a benchmark for innovation in environmental protection, resource and energy conservation, and socially responsible sustainable development. The entire city will be 'Green Mark Certified,' which is Singapore's scheme for setting sets environmental standards for buildings, and plans are to introduce a Green Mark Certification program for China. It is anticipated that the project will also provide significant economic development and employment opportunities to industries offering innovative 'green' solutions and technologies in infrastructure and transportation services, waste and water treatment, pollution control, renewable energy, and intelligent buildings systems.

Masterplan Features

A key feature of the Master Plan is a central core of conserved ecological wetlands and rehabilitated bodies of water. The areas surrounding this core are divided into four main districts, each served by an urban sub-center. Features of the masterplan include:

The Main Center of the Eco-city is the primary sub-center and is located on the southern bank of the historical Ji Canal. It is designed to maximize public waterfront access and support a variety of commercial, cultural, and recreational uses, thus allowing for a varied live-work-play environment close to the natural environment.

Residential and business park developments are located further away from the Main Centre. They are interspersed with well-designed open spaces to facilitate social

Eco-City Plan (Source: Tianjin Eco-City)

interaction, service retail to encourage street activity, and ensure a high-quality living environment for residents. There are also proposed university and hospital sites within the Eco-city.

Eco-Cells are the basic design unit of the Eco-City Master Plan. Laid out as a grid of 400 meter square units, the Eco-Cell format integrates different land uses within this modular grid. Educational institutions, commercial areas, workplaces, and recreational areas are distributed within these Eco-Cells and located close to the residential areas to minimize

commuting. Together, Eco-Cells add up to form neighborhoods, which together make districts, and finally form the urban centers.

Eco-Valley runs through Eco-city as a north-south connector. It serves as the main ecological green spine and incorporates water-sensitive urban design elements, such as bio-swales and dry streams. Eco-Valley also connects the major transit nodes, residential areas, community facilities, and commercial centers. It is a key public open space and focal point of the Eco-City. There will also be six waterways, or eco-corridors, linking the city's heart to surrounding rivers and the sea.

A Strategic Transit Plan includes a comprehensive public transport network, cycling paths and green connectors. A light rail transit (LRT) line running through the Eco-City serves as the main mode of transport, supplemented by heavy rail and a secondary network of buses and trams. The long-term target is for 90% of residents walking, using public transport or cycling when they commute within the eco-city.

Other Features

Application of innovative 'green' technologies ensures that Eco-City is an environmentally responsible, resource-efficient city. Various technologies will be adopted for efficient refuse recycling and sewerage, use of clean and renewable energy, and all buildings will conform to green building standards. The initial target for renewable energy generation is 15%.

A Strategic Plan for Water Supply establishes an extensive system of rainfall collection and sewage reuse, implements centralized treatment of sewage and wastewater recycling, develops and utilizes non-conventional water resources such as recycled water and desalinated seawater. It intensifies ecological rehabilitation and reconstruction, collects and uses rainfall in reason, strengthens ground water conservation and constructs a favorable aquatic eco-environment

Ecological rehabilitation includes a multi-tiered ecosystem pattern with a 'reservoir-river-wetland-green land' structure. The plan suggests strengthening discharge control over the reaches of the Ji Canal, as well as improving the saline-alkaline soil with filling, dredging and alkaline drainage and other biological improvement to restore the coastal ecosystem.

Heritage conservation ensures that existing buildings within the Eco-City that are structural sound and historically important are saved and restored--the retention and adaptive re-use of these historic structures serves as a link to the area's heritage.

Program

Housing plans include land for 110,000 energy-efficient units. 20% of Eco-City's homes will be public to ensure the city is made up of residents from all income levels. Displaced rural residents receive 100% relocation and an employment guarantee.

Commercial & Office Facilities will be located near transit stops and distributed in each residential community and industrial zone. The goal is to create sufficient employment within Eco-City such that the need for residents to travel beyond the city for work is reduced.

Cultural & Recreational Facilities in the city center include galleries, performance halls a cultural center. There will a three-grade library system. Butterfly Cay will have an ecological science center, as well as a Ji Canal Museum and a cultural park. Local recreational facilities will be set up according to the needs in each residential area.

Medical Services will be located in the coastal area north of the former watercourse of the Ji Canal, including a municipal-level comprehensive hospital.

Educational Facilities will be integrated with the environmental R&D occurring in the commercial zones. Key scientific research institutions and laboratories will be established at an International ecological science and technology university in the southwest part of the city.

Infrastructure

Digital Service Network is a managerial platform of urban information, used to carry out real-time, all-round, and whole-process supervision, treatment and response to the structure and affairs in the city. It uses digital information and network communication technology to integrate all information resources to make Eco-City efficient, convenient,

reliable and dynamic. A disaster response command center is also included. The comprehensive service network will have flexible, secure linkage with city-wide, 100% wireless broad-band coverage.

Flood Protection includes construction of a natural flood protection dike along the west banks of the city, in accordance with the flood prevention standards. Together with the tidal gate project, the wave prevention dyke will be built to create an anti-tidal storm coastline with Binhai Avenue.

Development

Eco-City is expected to take 10 to 15 years to complete, however, the Phase 1 three square kilometer start up area will be finished in three to five years. Initial construction began in February of 2008.

Eco-City Service Center is the first building of the project to be started. With 46,000 square meters of built space, it will be completed in June and put into use in July 2008. It serves headquarters for Eco-City's administrative committee and the joint venture investment company. The Service Center also serves as the public welcome center and sales office for the project. Sustainable features of the Service Center include a curtain wall of aluminum honeycomb and perforated aluminum panels for natural ventilation, low emissive glass to reduce air conditioning use, and a solar water heating system.

Financing

Eco-City is organized as a joint venture between Keppel Corporation, a multi national investment company based in Singapore, via its Singapore Tianjin Eco-City Investment Holdings Pte. Ltd. (STEC), and the Tianjin Economic and Technological Development Area (TEDA) Holding Company, a wholly owned company of the Tianjin municipal government via the Tianjin Eco-City Investment and Development Co., Ltd (TEC). The joint venture (Eco-City) has an initial paid in capital of US $570 million, equally distributed between the two partners.

Keppel will also seek equity partners, including the Qatar Investment Authority, which holds a 10% interest in STEC. TEC will contribute the land in-kind, beginning with the initial three square kilometers of land for phase one and continuing until the project is complete. As the master-developer of the Eco-City Project, the joint venture company will also sell certain land parcels to third parties for development in order to accelerate the progress of the development and to achieve variety in design. The Eco-City Administrative Committee, formed by the Chinese Government, will, among other things, be responsible for the construction of infrastructure such as transportation, utilities, and public amenities such as public schools and hospitals in the Eco-City, and will consider granting appropriate and favorable incentives when needed.

Summary

Tianjin Eco-City is a City in a City, located within the existing city of Tianjin China. It has a land area of 30 sq km, expected population of 350,000, and an expected cost of $US

7.1 billion. It will be built on marginally developed land and underutilized flood plain. It has a variety of uses but is an integrated section of the larger city of Tianjin. Eco-City's theme is Environmental, intending to be environmentally friendly, sustainable, and socially responsible. It also intends to be a showcase for sustainable development and a template for Chinese cities struggling to balance rapid economic growth with environmental protection. With expected completion in 2023, the project is currently going through design review, although the Eco-City Service center and initial infrastructure are currently under construction.

Case Study Conclusions

None of these examples present a radically new city model. KAEC has elements of the segregated uses characteristic of modernist developments, while Eco-City has social goals and agricultural uses of the Garden City. Downtown Jebel Ali, contrary to its name, is not downtown but instead on the edge of Dubai like a New Town. What is perhaps innovative is that KAEC and Tianjin Eco-City both have lofty goals of creating entirely new economies, and in the case of Tianjin, addressing significant environmental challenges that exist in China. Downtown Jebel Ali, however, has the more modest goal of creating a livable, pleasant and vibrant community, one that has been repeated in other real estate markets around the world and thus more likely to be successful in the near term. Finally, it remains unclear who will govern and manage these cities. As a City in a City, Tianjin will likely be integrated into the existing city bureaucracy, but KAEC and Downtown Jebel Ali provide no explanation for who will provide fire and police

protection, or even such mundane services as trash removal. But all megacities face these issues, and a number of significant other challenges, which are addressed at length in the following section.

9. Consequences of Megacity Building

It is easy to be awed by the spectacular plans and colorful renderings of these new megacities. The glossy advertising and effusive press releases present a carefully crafted image of urban utopia, with clear blue skies, sparkling skyscrapers and palm trees gently swaying in the breeze. And the speed at which they are being built is an extraordinary example of man's economic, analytical and physical might. But such rapid development, here or anywhere else in the world, comes with its own set of consequences and issues, ones that must be addressed and weighed carefully, before proclaiming the success of these gleaming new cities. In this section we will review some of the key indicators of success for these megacity projects, and whether they reach the great goals that countries have for them.

9-A. Labor and Employment Issues

Labor and employment are some of the key reasons given for megacity construction, particularly in the Gulf States, however, in spite of the overall economic boom in areas such as Saudi Arabia and the UAE, unemployment and underemployment have declined very little and inflation is rising quickly. Across the region, youth unemployment averages at least 25 percent, close to double the global average (New York Times, 2008). The expansive plans for new knowledge cities, educations zones and global university partnerships are simply not far enough along to have much of an impact.

One reason for the stubborn unemployment is that industries that do create many new jobs, like tourism, agriculture and construction, import workers from southern and southeastern Asia because they tend to be cheaper and more productive than the local workforce. Primarily from South East Asia, Pakistan and India, foreign laborers make up 80 percent to 95 percent of the private sector work forces in the Persian Gulf states (New York Times, 2008). But the migrant workers are beginning to show signs of unhappiness with their workplace and living conditions. In recent months they have gone on strike to protest living conditions and inflation, which is eroding their earnings (New York Times, 2008). With foreigners making up roughly 40 percent of the population of the Arabian Peninsula, such labor unrest is ominous (New York Times, 2008).

Construction workers in China face similar problems. According to Human Rights Watch, migrant workers often work inhumane hours on dangerous job sites, are often denied adequate food and housing, and their employers fail to deliver workers' medical and accident insurance in violation of China's labor laws. Migrant workers must also contend with the chronic problem in China of owed wages. In 2007, 72.2% of migrant construction workers faced delayed wages or payments or arrears (China Labor News, 2008) because employers have a habit of withholding wages and paying less than promised. Migrant laborers often have no recourse, since many are working in the city illegally and have no labor contract. Confrontation is the only way to obtain unpaid wages but sometimes leads to physical exchanges, with painful, often fatal outcomes.

9-B. Impact on Political Stability

During the last great oil boom of the 1970s and ’80s, the Middle Eastern producers largely squandered their wealth. Some did set up vast social programs that improved health care but they mostly sent the money overseas, putting it in foreign real estate and Swiss bank accounts (New York Times, 2008). This did nothing to develop or diversify their economies, and so when the oil market collapsed in the 1990s, economic problems led to political discontent, terrorism and rebellion.

Some Middle Eastern oil producing countries and sovereigns are trying to be smarter, investing billions of dollars at home, building industries, repairing roads and factories, and expanding social services, using oil money to diversify the region’s economies and create jobs. Developing megacities is one result of this. The danger is that while more oil money is being spent in the region, it may not be being spent where it is most needed. Much is being re-invested in projects intended to produce quick profits for investors rather than long term political and economic gains. A large portion finds its way to non-productive sectors like real estate and oil refining. A cooling global economy that again slows oil revenues could easily re-ignite citizen discontent.

China faces a different kind of threat to political stability. The seizure of farmland by local officials for economic development, including new city building, has become one of the most contentious issues in the Chinese countryside. Recently, officials in the city of Yulin seized about 6.5 square kilometers for development and farmers began holding protests on the disputed land to block construction. The standoff ended in a violent

crackdown by paramilitary police officers in which the 27 people were arrested and given long sentences, including 15 years for the protest leader. The Ministry of Public Security estimates that in 2007 there were 87,000 such protests and mass incidents (Anthropology News, 2007).

9-C. Community Fabric

In the ancient Qianmen neighborhood of Beijing, workers are busy tearing down many old buildings and then rebuilding them, as old buildings, under a government sanctioned Disneyfication. As one resident observes, “All these new buildings coming up in Beijing are like the jeans that people in foreign countries wear - they have nothing to do with our traditional Chinese culture, and they've destroyed Beijing's layout and cultural atmosphere." There is a belated re-emphasis among Beijing's city planners on preserving at least some of the city's traditional layout and flavor, but already most of the old courtyard neighborhoods have been destroyed, and their tight-knit communities scattered (The World, 2008).

Ruins at Qianmen are cleared in Beijing, Oct 2006 (Source: DayLife)

Architect Zhou Rong, Associate Professor at Tsinghua University, claims that that Beijing has a relentless landscape of towers and concrete, a model that many of China's provincial cities have copied, losing their own unique local flavor in the process. Furthermore, according to architect Andre Schmidt, the author of *Big Bang Beijing*, one of the biggest problems in Beijing, is that it is becoming more and more gated and hostile. He says the city is turning into a series of newly minted residential and commercial islands, separated by parking lots and moats of green space, which divide the city into a much larger grid, increasing the need for cars and creating an unfriendly pedestrian experience.

9-D. Social Equity

While most megacity development in the Gulf Region is occurring on previously undeveloped, mostly unpopulated land, China's voracious appetite for development sites often involves government sanctioned urban land clearings or rural takings. Experts estimate that as many as 70 million farmers have been left without land due to the spread of land development (International Herald Tribune, 2005). Under current Chinese real estate law, rural land has no value. If the government wants to take land, it can take it more or less at will. City officials pushing lucrative development projects have confiscated rural land by guile, fiat or force (New York Times, 2004). Critics claim that too many cities around China are lately run like profit seeking corporations, with municipal officials doing secret deals with developers. In the previously mentioned Yulin case in Sanchawan, farmers claim that city officials sold confiscated land for 50 times or more than what they had been compensated for it.

The conflict over land rights is not limited to farmland. In 2003, Human Rights in China reports that representatives of 300 households in a neighborhood designated for urban clearance in Shanghai were arrested during an attempt to petition officials in Beijing, after Shanghai officials failed to address their issues. One family, for example, owned a rental property measuring 140 square meters (about 1260 square feet), but the real estate company redeveloping the neighborhood agreed to compensate only for a 30 square meter unit, thus reinforcing the widespread suspicion that local government officials are in league with developers.

Nowhere is urban clearance more aggressive than in Beijing. In historic neighborhoods such as Qianmen, once home to Qing Dynasty opera singers and classical scholars, many streets and hundreds of courtyard houses have been razed. For the past decade many of Beijing's old hutong neighborhoods, the ancient, densely populated enclaves of narrow, winding streets and crumbling courtyard houses, have been steadily demolished and

Residents search the ruins of their house at Qianmen, Oct 2006

(Source: DayLife)

replaced by office towers and high-rise apartments (New York Times, 2006). Qianmen was one of the last intact hutongs, home to teachers, shop owners, migrant workers and other working-class people. But with its central location, the neighborhood became enormously valuable, and a prime target for real estate developers.

9-E. Housing Affordability

The gulf region is experiencing spiraling costs of living. Both the rise in energy prices and the flood of oil revenues have stoked inflation. Qatar's current rate is 14 percent, up from 2.6 percent in the 2002-2004 period (New York Times, 2008). A large portion of the increase is housing, which has risen significantly in many rapidly developing regions. Average rent in Abu Dhabi, for example, was $272 per square meter ($27 per foot) in the last quarter 2007 and $430 per square meter ($43 per foot) by the second quarter 2008, up 58%. Meanwhile, Dubai's average rent was $343 per square meter in the last quarter 2007 and $420 per square meter in the second quarter of 2008, representing a 22% change (Zawya Information, 2008).

Similarly, Abu Dhabi's house prices grew 61% between the last quarter 2007 and the second quarter 2008, while Dubai saw a 37% growth in the same period (Zawya Information, 2008). A recent report from HSBC suggests that the situation will be further aggravated by project delays in Abu Dhabi caused by delayed infrastructure development and the increasing number of residential units throughout the UAE being converted into office space. And in India, housing prices have soared, rising 16 percent a year for the

last four years. In Bangalore and Mumbai, prices doubled in both 2005 and 2006 (The Economist, 2008).

It is important to remember that much of the housing in these new megacities is targeted at luxury buyers, many of whom are part time residents and unlikely to be affected by the housing crisis. Instead, the shortage is felt by mid-level workers newly arrived to the city, and the day to day service workforce that makes the city run. According to Kartun Development Group, if Dubai's population is expected to grow to 6.5 million people by 2015, a city comparable in size could require workforce housing for as many as 1 million people, yet Dubai current has only 50,000 such residential units.

For the 25% of foreign-born workers living below the poverty line, there appears to be some short-term relief. Al Rayan Investments, for example, has begun constructing of the biggest labor residential camp in Abu Dhabi. Located on the edge of the city, the compound will provide temporary accommodation for around 32,000 people. In Dubai, Labor City, with housing for 12,500 workers, is the first of seven such cities in Dubai Industrial City. And in Qatar, the Gulf Times reports a new project to house 50,000 workers. But these examples are merely temporary accommodations, and reinforce the view that migrant laborers are a resource that is to be used, controlled and, when finished with, shipped out (Kip Report, 2008).

In Shenzen China, the situation is equally challenging for migrant workers who are building new sections of the city. Before the implementation of Communist Party

economic reforms, the government effectively prevented hordes of farmers from coming to cities through a system of residential permits called hukous. But now the system is relaxed, and only two million of Shenzhen's more than 10 million people have the permits, creating overwhelming demand for housing (The World, 2008). In response to spiraling housing costs the provincial government is making available inexpensive apartments, but according to regulations, only those with Shenzhen residence hukous are eligible, thus migrant workers must still live in substandard conditions, overcrowded and often makeshift.

Now, governments appear to be addressing the issue. Beijing launched a series of new measures requiring at least 70 per cent of all new residential property projects in China to be homes with floor areas of less than 90 square meters (China Daily, 2006), thus providing more affordable units for people with low wages. Still, many people from old Beijing have already been forced to the city's outskirts because they can no longer afford to live in their old, newly redeveloped neighborhoods (New York Times, 2006).

9-F. Real Estate Bubbles

There is a concern that supply of property in Dubai is beginning to outstrip demand. A recent analyst report warns of a dangerous oversupply situation in Dubai with the massive glut of housing units set to hit the market in 2009 (Fitch, 2008). From 2003 to 2006 alone more than 12,000 homes were built (Money Week, 2006), and with development of the Palms, Dubai Marina, the Arabian Ranches and dozens of other residential projects, anyone wishing to sell a home will have stiff competition from new

offerings. The Fitch Report also notes that a glut of office space could also emerge noting that Dubai has as much commercial property under construction as Shanghai, which has 13 times as many people. Time will tell if the region can support multiple and repetitive Middle East Financial Centers, for example, in Dubai, Abu Dhabi, Bahrain, Saudi Arabia, and Tunisia.

Also alarming is the volume of speculative investing. Late in 2004, Middle East Business Media reported that 85% of new apartments and 50% of new villas were bought by speculators, which are resold before completion. This implies that most sales are secured by 10% deposits and then traded like commodities (Money Week, 2006). Fueling the speculation are small firms set up solely for the purpose of buying and flipping large blocks of housing. In other words, the majority of those buying in Dubai have no intention of living there. This dangerous speculative scenario eerily parallels the recent housing collapses in the UK and US. Furthermore, some luxury resort developments are highly vulnerable to foreign economies, such as the Palm Jumeirah, which sold 25% of its properties in the UK, mostly to buyers who are currently feeling the impact of a severe slowdown in the financial sector.

Much like the Middle East, India's housing prices have recently soared. Apartments in Mumbai now cost an average of three times more than in Shanghai, even though incomes in India are much lower than those in China. The question is not whether the prices will fall--but by how much. Recent reports have the fall already taking place, as New Delhi and other parts of Northern India have seen real estate prices drop some 20 percent over

the last year (International Herald Tribune, 2008). 2007 experienced a 50 percent drop in actual transactions, even though real estate developers were forced to drop prices 5 to 10 percent in order to bolster demand in some of India's biggest cities (Hindustan Times, 2007). The demand for both modest and upscale residences has seen a sharp decline, especially for downtown luxury residences, where transactions seem to have hit a standstill.

China, too, has experienced widespread real estate speculation. Its real estate markets may have missed the massive declines seen elsewhere around the globe, but conditions in China's 70 major cities have cooled sharply. Some local developers in China are feeling the pinch from tighter lending standards and the swing from a seller's to a buyer's market. (China Economic Review, 2008). Shanghai's property vacancy rate has recently risen to roughly 25% (New York Times, 2008).

The Chinese government recently took aggressive steps to tame real estate markets, by banning buyers from flipping unfinished apartments, imposing a 5 percent capital gains tax on sales of homes owned for less than two years, and raising down payments and mortgage rates. Officials also placed tougher restrictions on residential property purchases by foreign institutions and individuals, and raised the equity to loan ratio required by property developers. According to a report Deutsche Bank, the regulations knocked the wind out of the speculative end of the market in Shanghai, cutting sales in half and prices by as much as 15 percent.

9-G. Sustainability

China is witnessing the largest rural to urban migration in history. As of the end of 2006, 44% of China's population lived in urban areas with that figure set to grow to as much as 70% by 2050, consisting of 1.1 billion people engaged in economic activities more energy intensive than the rural activities they abandoned (Green Leap Forward, 2008). In Beijing, at least, the government is building several new subway lines, and encouraging the fast-growing urban population to move to self-contained suburbs and new towns on city periphery, but this may merely export the problems occurring in the cities.

But natural resources overall are being strained, and it is unclear if the demands of China's building boom can be met indefinitely. China's steel consumption, including structural steel, doubled in five years to reach 398 million tons by 2006, and now accounts for 32% of the world's consumption (Organization for Economic Cooperation and Development). And like steel, concrete for construction uses vast quantities of fossil fuels and water, and accounts for more than 5 percent of human-caused carbon-dioxide emissions annually (MIT Technology Review, 2008). Clearly, sustaining the current level of megacity development in Asia will be a key challenge in the future.

In the Gulf States, enormous new projects are big built in the harshest of environments. In a region that regularly reaches temperatures well above 100 degrees Fahrenheit, developers build indoor ski slopes and monumental glass and concrete towers, which trap the heat, rather than shield the occupants from it. In Abu Dhabi alone, electricity demand

will begin to outstrip supply in 2009, and by 2020 demand will exceed supply by 100% (Abu Dhabi Water and electricity Company).

Leveling Dubai's desert for another development (Source: Drew Gardner, Photostream)

Furthermore, the islands of development so familiar in megacities are connected with miles of multi-lane roadway, which dramatically increases the use of private, motorized transportation. As a result, Dubai's traffic congestion, in particular, is already legendary. Traffic will certainly be a problem for developments like Palm Jumeirah, a new luxury resort city with an expected population of 70,000 people. Aside from the potential environmental impact of dumping 94 million cubic meters of sand and 7 million tons of rock into the Arabian Gulf for the sole purpose of creating developable land, Palm Jumeirah is a peninsula, thus the only road from the city (down the palm's trunk) leads directly to Dubai's main thoroughfare, Sheikh Zayed Road, where traffic is constantly jammed up. Although two new road projects are planned for the area, so too are 100 new residential towers, accommodating up to 40,000 more people (Money Week, 2006).

Dubai Traffic Jam, Oct 2005 (Source: Reuters)

Traffic and the environment will also be negatively impacted by the developing world's reliance on western land use models, that allow decentralized suburban residential and industrial parks to be built in more and more remote locations. Like the Garden City builders, developers such India's MARG and China's Vanke, continue to build vast, lower density neighborhoods, many of which have little or no mass transit, relying instead on heavy use of individual cars. The spread of suburbia is already at work in Abu Dhabi, for example, as the severe housing shortage has forced people to move to Dubai and make the hour and a half commute by car to the UAE capital every day (HSBC, 2008).

One could argue that Dubai itself is the extreme example of remote, greenfield development, although the original village has existed there for thousands of years. Perhaps a better (or worse) example is King Abdullah Economic City, being built on an isolated piece of coastal desert, hundreds of kilometers from the nearest established cites of Jeddah and Medina. So isolated is the site that infrastructure development includes a

70,000 cubic meter per day desalination plant for drinking water, and a six-turbine natural gas power plant for electricity to power the new city. Locating new mega-cities closer to existing urban infrastructure would allow them to tap into existing systems, rather than build anew.

Lastly, there is the general issue of pollution. In China, lax environmental practices have already created 16 of the world's 20 most polluted cities, and the World Bank estimates that 700,000 Chinese die prematurely each year from illness related to air and water pollution (The World, 2008). Similarly, air quality in Dubai has continually worsened, with vehicles contributing almost 80 percent of the pollution. While the population of Dubai grows at an average annual rate of 6.4 percent, the number of cars is increasing an average of 10% per year, compared with a worldwide average of 2% to 3% (Urban Land, 2007). Furthermore, the UAE overall has one of the world's highest levels of domestic waste. Per-capita household waste has reached an annual average of 1,598 pounds (725 kg) in Dubai and 1,609 pounds (730 kg) in Abu Dhabi, vs. 1,565 pounds (710 kg) in the United States (Urban Land, 2007). Clearly, Megacities will only intensify an already detrimental pollution situation.

In Saudi Arabia, the King Abdullah Economic City has as the cornerstone of economic development in the industrial zone, the world's largest aluminum smelter, with an initial capacity of 700,000 tons per year starting 2010 and growing to 1.4 million tons. The Petro Rabigh integrated refining and petrochemicals complex already exists near KAEC and is expected to provide feedstock for KAEC's industrial activities. These new

industries, while generating jobs and economic prosperity, will also impact the environmental quality of life for those living in and around the new megacity.

Clearly, there are significant consequences to the megacity development boom. Labor unrest, increased unemployment and glaring social inequity each threaten the political and economic stability that city building claims to ensure. Sustaining such rapid growth is in question, as well, as overheated real estate markets and natural resources that are stretched to capacity threaten the progress that has already been made. Developers, as well as their government sponsors, will ultimately have to reconcile these concerns with the promises and benefits of new megacities.

10. Conclusion

The magnitude of megacity building, proposed, planned and in production in the world today is truly staggering. This thesis began with a history of city building, to put the recent phenomenon in context, and then described the characteristics that define 21st century megacities. With the introduction of the results of a global megacity survey, we were then able to quantify the amount of city building taking place, and categorize new cities by type and theme. We also investigated who the megacity developers are, how the firms are structured, and what the global city building industry looks like. Together with further research into the ambitions of sponsoring governments, the recent impact of globalization and rapid urbanization, and the political and market reforms that enable the real estate boom to occur, we were able to propose a framework for three megacity market models. The analysis yields a number of general findings about the megacity development phenomenon:

- The scale of megacity building is enormous, with over 100 projects in 30 countries, exceeding US $2 trillion, and encompassing more total land area than the state of Rhode Island.
- A large portion of the megacity building boom is occurring in the Middle East, where projects are mostly 'from-scratch,' ground-up new development. Asia is experiencing an equally large amount of activity, however it is more heavily focused on rebuilding, or expanding existing cities.

- The largest developments by land mass are spread out internationally, however the most expensive are concentrated in the Middle East.
- New megacities can be divided into four types, the New Megacity, City in a City, Annex City and Satellite City. They may also exhibit a number of themes that guide their development, from Economic to Knowledge to Environmental. Some megacities have a combination of types and themes.
- The largest megacity developers by number of projects in production may not be building the largest cities by cost or land mass, although the most active megacity developers are equally distributed globally.
- Generally speaking, development firms in the UAE were formed within the last ten years, yet they have the most international reach.
- The megacities in New and Transitional Markets, with in some cases hundreds of buildings, are being built from the ground up in a matter of a few years, while in established real estate markets it may take decades to complete a single structure.

Arguably, gathering megacity data and analyzing the results is merely an exercise in reconnaissance. A noteworthy effort since it has never been done before, but of little help in understanding the implications of the megacity phenomenon. It is thus necessary to find meaning in the research, even if such an exercise is based in speculation and necessarily leaves other broader questions unanswered. Here, then, are conclusions that may be drawn from the study of 21st century megacity building:

- **Turnkey Cities -** Cities of the past were incremental, growing and adapting over time to accommodate changing uses and fluctuating population. Today's megacities are turnkey cities, planned and built in their entirety, nearly overnight.

- **Global Products -** Similarly, old cities were handcrafted by many generations and were unique to their context. Conversely, new megacities from Dubai to Kazakhstan, to Korea are global products, with interchangeable city types and themes. The largest developments feature the same roster of uses—high-rise office towers, residential of varying heights, shopping malls, culture and entertainment, universities and mosques.

- **Standardized Design Themes -** As global products, megacities also tend to all look the same, with a circular organization focused on one or two headline grabbing point towers, distinct commercial and residential zones, and extensive manmade water features. Nakheel alone has added 1000 kilometers of new,

Downtown Burg Dubai
(Source: Downtown DXB)

Dubai Festival City
(Source: Connect.net)

valuable waterfront real estate in Dubai, through its ambitious island and canal building projects. Uses are often islands of development with little or no integration, surrounded and connected by broad roadways. There are some notable exceptions. Masdar in Abu Dhabi and Aqaba Port City in Jordan, are relatively mid rise, have well integrated uses and are arranged on a traditional street grid. But circular or grid, megacity designers seem to replay modernist programs, in spite of the limited historical success.

Aqaba Port City (Source: Skyscraper City)

Masdar, Abu Dhabi (Source: Masdar)

- **Cities for the Wealthy -** One can't help but notice that the operating model of many Middle Eastern governments and their developer partners often don't match the operative model. Emaar has announced publicly that there is 'purchasing power and demand at the lowest income levels of society,' yet most proposed and developing projects focus on luxury residences and upscale shopping, world class office space, and resort lifestyles that include thoroughbred horses and Indy car racing. Little attention appears to be is given to workforce or moderately priced housing.

In Dubai, for example, the average price of a one bedroom apartment in the Ring Road neighborhood is US $240,000 and in Downtown Dubai a similar unit costs US $350,000. Yet, the average per capita income in 2007 in the UAE was only US $34,300 (IPR Strategic Business Information). Conversely, to avoid building cities segregated by income, China and India appear to be more intentional about planning diverse and integrated developments across key buyer and price segments.

- **Vastly Larger Markets -** Increasing global mobility and wealth expands the market for potential customers, well beyond political or geographic boundaries. Middle Eastern and Asian countries are building vast, modern international airports to accommodate fleets of jumbo jets from cites around the world, while new superhighways and high speed trains will shorten the travel time between regional economic hubs.

  Dubai, for example, is within three hours' flying distance of well over 1 billion people, suggesting that the potential market for the wealthiest—the top 1%—is 10 million people (US News, 2008). And according to private equity firm Raynuma, by 2012 there will be twice as many middle class consumers living within 4 hours of Dubai, than the entire population of the USA.

- **Conglomerate-Scaled, Global Development Industry -** Megacity development is dominated by extremely large developers: Emaar, Nakheel, ALDAR and

DAMAC in the UAE, Vanke and CapitaLand in Asia, and Forrest City in the US. While Asian firms have extensive reach throughout the vast Chinese market, the firms from the UAE have expanded their markets throughout the gulf region, and into Central and Southeast Asia. For these developers, real estate is no longer local but global. The sub-developers, too, have extensive global operations, as they develop on behalf of master developers the individual parcels that make up large megacities.

- **Fueled by Global Capital -** Many factors contribute to the rapid growth of megacities but none is as consequential as the tidal wave of global capital liquidity resulting from the Middle East oil boom and the furious industrial growth in Asia. The reasons for building megacities, however, are fundamentally different in these two regions of the world. Middle Eastern countries are building to create new industries, jobs and prosperity, while the transitional markets of Asia and India are generally building in response to intense demand from a rapidly expanding middle and upper class created by economic growth.

Unanswered Questions

"What happens if you drop, just as suddenly as modern capital markets will allow, a practically infinite supply of money onto a mostly inhospitable and uninhabited stretch of salty sandy soil? How do you build a great city? How do you build a great society? Will it work out? If Abu Dhabi builds it, will the people of the world come?" -- Katherine Zoepf, *The New York Observer*

Indeed there are the fundamental long-term questions regarding the viability megacity development. It is unclear whether the billions of dollars, massive amounts of construction material and millions of labor hours are enough to physically replicate great cities like London, Tokyo, or New York, which have grown organically over hundreds of years. Nor is it certain that these new cities will function in the way in which they were intended. Building a great society is a challenge that has confounded man for thousands of years, and while the effort to do so may involve building great cities, it is a topic well beyond the scope of this thesis. But in closing, this thesis poses a number of specific, near-term questions about megacity development that merit further research.

- **Can the rapid pace of megacity growth continue?**

  Over the last five years, real estate markets in the UAE, China and India China have experienced explosive growth, but are now experiencing more volatility and a recent pullback. External factors could derail the market, with the overseas credit crunch and sub-prime lending crisis impacting the Dubai real estate market, for example, since expatriates and foreign investment heavily drive demand there. And despite initial enthusiasm for megacity projects, some private sector businessmen are starting to question whether the ambitious plans are realistic. Many wonder if the huge emphasis on residential, leisure and financial services will really appeal to the private sector, especially since many similar schemes are under way across the region (The Middle East, 2007). Fitch Ratings, however, maintains that demand in the Gulf Region is still robust, with expanding

population, rising incomes, foreign demand and increasing mortgage availability among the key factors underpinning growth (MarketWatch, 2008).

In China, the China Development Institute reports that the total supply of new residential houses amounted to nearly 1.54 million sq m in the first half of 2008, down 54% from a year earlier. About 650,000 square meters remained unsold, up 84.5% from the same period last year. Yet the Chinese Academy of Social Sciences (CASS) maintains that real estate markets won't collapse, saying the China's urbanization and residents' desire for better housing, compounded by the scarcity of land and the government's tightened grip on land supply, and the National Development and Reform Commission, China's top economic planner, claims that more people will put their money in property to avoid the erosion of returns faced by bank deposits. It is unclear, then, whether megacities will continue to grow at such a rapid pace, and what future impact, if any, the slowing global economy will have.

- **Are megacities environmentally sustainable?**

  Like all cities, new megacities will eventually face the effects of global warming, overpopulation and pollution. Those that are built in remote locations with harsh climates require entirely new, resource consuming infrastructure. And if mass urbanization continues as expected, so will traffic congestion, volumes of waste, threats to air quality and demands on natural resources.

Fortunately, developers are adjusting their business practices. China Vanke, for example, is the first Chinese company to move into prefabricated housing, aiming to build 4 percent of the company's houses with prefabricated materials by 2012, resulting in large savings in electricity, water, and timber used during construction. Energy gains alone could amount to the equivalent of 12 days output from the Three Gorges Dam (Architectural Record, 2008). And entire Environmental Cities, like Tianjin Eco-City in China and Masdar in Abu Dhabi, are being built specifically to address issues of environmental and social sustainability. But these are unique exceptions. Only six of the 101 cities in the megacity survey, only six have an Environmental theme. One can only hope that in the future, all megacities adopt the technologies developed in the Environmental Cities.

- **What impact will megacity building have on employment?**

  The growth in China's economy has caused urban labor supply to fall short of labor demand. In fact, 20% of China's rural areas no longer have any surplus labor, reports the government-run Rural Economy Research Center. As a result, wages are going up. Thus, laborers lucky enough to find work are arguably better off than they were in their rural communities. Still, construction work in China is dangerous and temporary, wages are uncertain, and living conditions are often substandard.

In the Middle East, proposed Knowledge and Education cities pursue a long-term strategy of nurturing the young population and providing opportunity for their new skills. Yet, many urban dwellers currently find themselves left behind without the skills or support needed to productively integrate into these rapidly modernizing macro-economies that are the basis of many new megacities (Middle East Youth Initiative, 2008). Furthermore, urban industries that do create jobs, such as construction and tourism, tend to hire temporary workers from Southeast Asia instead of locals, returning them to their native country when projects are competed. Perhaps in the future growing economies in the Gulf Region will create a labor shortage, necessitating permanent residency for immigrant workers, but there is no immediate indication of this happening.

- **Where will megacity populations come from, and where are they living now?** China and India have the advantage of a significant and growing middle class that is trading up to housing better suited to their new-found prosperity, while general economic growth and urbanization increases demand for all property types, including commercial, retail, office and leisure. Conversely, in the UAE expatriates make up nearly 80% of the population (New York Times, 2008). It is unclear whether the large, somewhat transient population of foreign nationals will maintain its Middle East base over the long term, especially if the next wave of economic growth moves to other developing countries. And even though air travel greatly expands the market for mega projects in the UAE, rising jet fuel

costs or security concerns could quickly restrict now convenient access to and from distant locations.

Furthermore, what will happen with the old existing cities and workers' camps, as former residents vacate them, in pursuit of the better quality of life offered by new megacities? These may become low-income ghettos that house the working poor and unemployed, further segregating the economic classes and widening the gap between haves and have-nots.

Most importantly, will megacities succeed? Many megacities will be built, while others will languish, living only on paper due to lack of funding or changing political conditions. Success of those cities that are indeed built will certainly be defined by different metrics—city building to create a national identity, magnitude of property sales (of land, units or buildings), population growth and occupancy, employment and income growth, or capitalization rates on re-sales. Failure, too, will be measurable. Stillborn projects may be less notable than those that start but are never fully realized. Failure to deliver the promises of economic growth, employment, and a higher standard of living for all citizens may put political leaders at risk and create social instability.

In the Middle East, as in China and India, the level of commitment in the most senior echelons of government is high, as is the extent of their control. Fitch Ratings notes that with UAE governments controlling in excess of an estimated 50% of real estate supply in the next few years, it is unlikely that officials would allow the market to be flooded with

product, thereby eroding market fundamentals and their own projects' profitability. But only time will tell whether governments will continue to support ambitious megacity developments, seeing them through to a satisfactory completion.

11. Epilogue

This thesis is intended to be an introduction to the subject of megacity building, in its many variations, as it is occurring today throughout the world. According to Middle East Business Intelligence, in the past year alone the value of development projects planned or under way in the Gulf Region, including megacities, has doubled to more than US $2 trillion. In the largest market, the UAE, more than 90% of all investment is going into just two sectors: construction or oil and gas, and it is a similar picture in other markets. The sheer magnitude of city building, the audacity of the plans, the unrestrained optimism—makes megacities a fascinating topic.

Most megacities, like the Emerald City of Oz, sparkle with ambition and the promise of a better society. Yet they are similarly illusory, focusing for the moment on creating global financial centers and affluent enclaves of upscale housing, shopping and leisure, while the unpleasant realities of labor exploitation and excessive natural resource consumption go largely overlooked.

It is too early to tell if these new cities will be successful, and further research is necessary. As economic and real estate markets in the Middle East and Asia mature, they will become less opaque. Data will become more readily available, allowing cities to be evaluated not only on traditional real estate metrics, but on their social accomplishments, as well. Only then will we know if the vision for these new megacities—quality of life, economic growth, and global respect and admiration—was fully realized.

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Appendix 1 – Megacity Survey Data

(4 pages – see attached spreadsheet file)

Appendix 2 – Images of Cities in the Survey

Abu Dhabi, UAE

Masdar City

Source: Masdar

Al Reem Island

Source: Al Reem Island

Shams Abu Dhabi

Source: Emirates Network

Najmat Abu Dhabi

Source: Emirates Network

Pearl Marina Square

Source: Axum Group

Addax Port

Source: Orange Properties

Rawdhat

Source: Rawdhat Abu Dhabi

Ajman, UAE

Al Zorah


Source: Al Zorah

Emirates City


Source: Skyscraper City, Emirates Property

Source: Skyscraper City

Marmooka City

Source: Marmooka City

Berjal City

Source: Gulf News

Awali City

Source: Awali City

Eye of Ajman

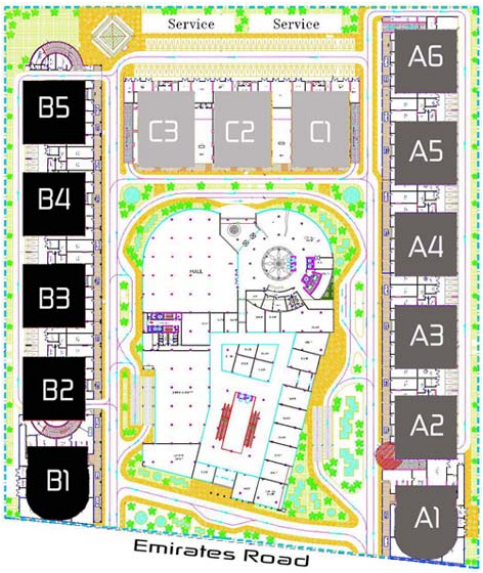
Source: Eye of Ajman

Ajman Marina

Source: World Architecture News, Skyscraper City

The Boulevard

Source: aa property



Dubai, UAE

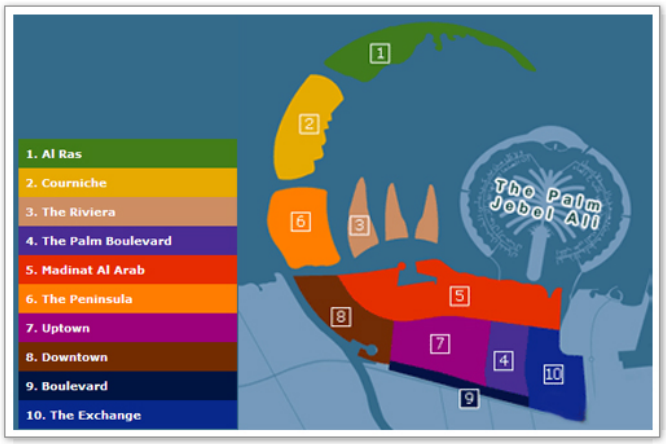
Dubai Festival City

Source: Contect.net, Food International

Dubai Waterfront City

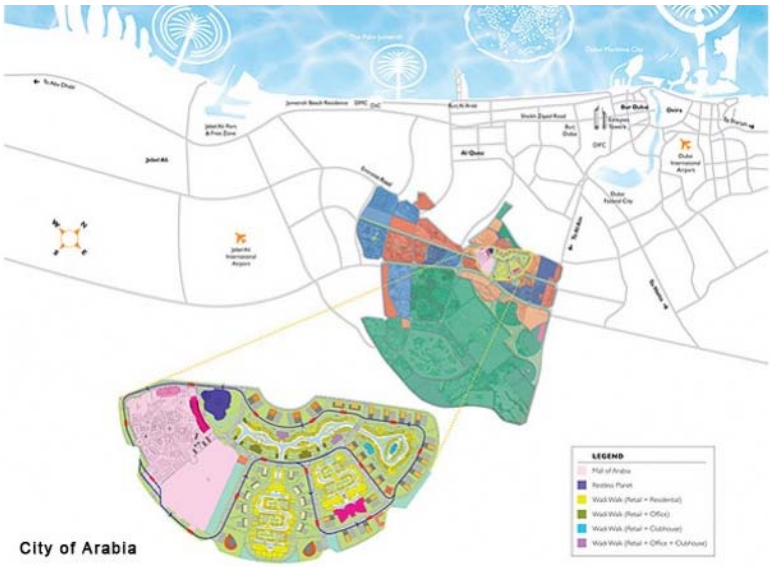
Source: MEC Films

Source: Dee Zeen



Source: Vista Dubai, Dee Zeen

City of Arabia



Source: PRV2

Downtown Jebel Ali

Source: Bovis Lend Lease

Source: Limitless, Skyscraper City

Downtown Burj Dubai

Source: Downtown DXB

Source: AMEinfo

Mohammed Bin Rashid Gardens

Source: Skyscraper Form

Business Bay

Source: Business Bay

Dubai World Central

Source: Zawya

Sharjah, UAE

Nujoom Islands

Source: Nujoom Islands

Source: NIQ

Umm Al Quwain, UAE

Al Salam City

Source: Real Vision Homes, Emirates Network

Bahrain

Bahrain Financial Harbor

Source: Skyscraper City

Bahrain Bay

Source: Skyscraper City

Kuwait

Madinat al-Hareer - "City of Silk"

Source: Skyscraper City

Jordan

Abdali New Downtown, Amman

Source: AMEinfo

New AZESA City, Aqaba

Source: Skyscraper Life

Oman

Al Madina A'Zarqa (Blue City)

Source: Emirates Network

Qatar

Lusail City

Source: Emirates Network

Source: Urban Planet

Source: Skyscraper City

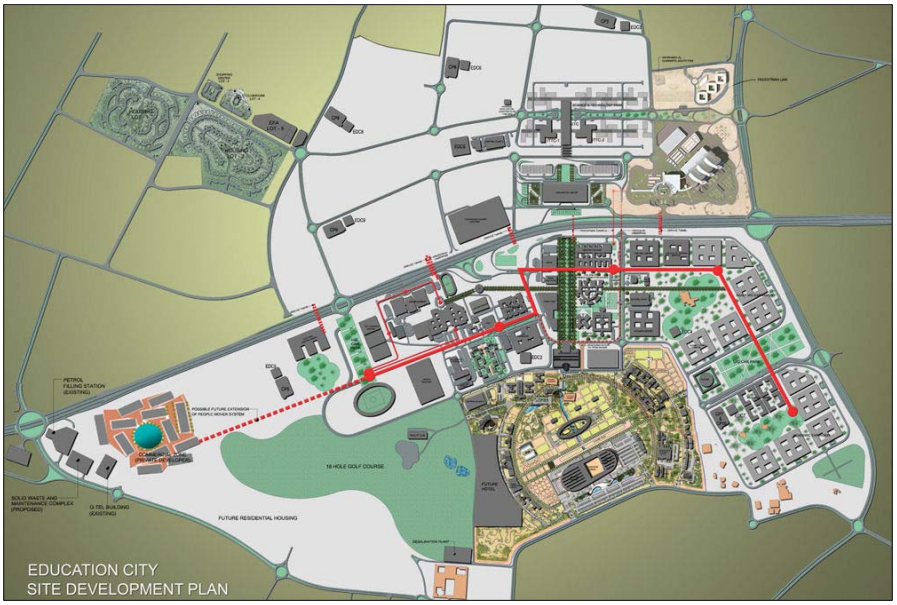
Energy City (Lusail)

Source: Energy City

Marina District (Lusail)

Source: Skyscraper City

Education City



Source: Skyscraper City

Saudi Arabia

King Abdullah Economic City (KAEC)

Source: Emaar, the Economic City

Source: WATG

Knowledge Economic City (KEC)

Source: Madinah KEC

Jazan Economic City

Source: Skyscraper City

Al Wasl

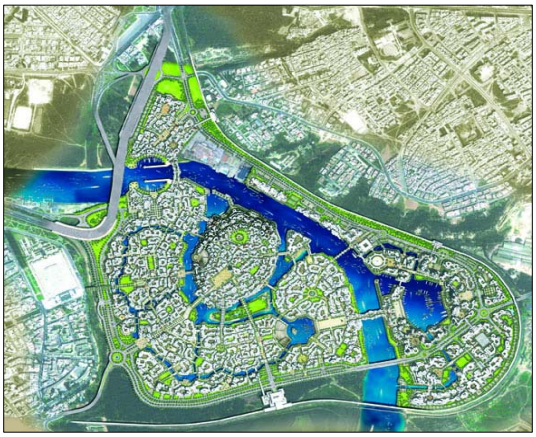
Source: AMEinfo

King Abdullah Financial District

Source: Skyscraper City

Morocco

Amwaj



Source: bouregreg.com

Sudan

Almogran

Source: Skyscraper City

Tunisia

Bled al Ward

Source: Skyscraper City

Tunis Financial Harbor

Source: Skyscraper City

Mediterranean Gate

Source: Skyscraper City

India

Odyssey Science City, Bangalore

Source: Skyscraper City

Mini City, Hyderabad
Delhi Manhattan
Mumbai Manhattan

Chic cities

DLF said work will begin simultaneously at sites near Mumbai and Gurgaon later this year. Land acquisition is complete.

Creating new cities from ground up, with a US-style toll culture to finance their upkeep, is catching up.

Delhi
Hyderabad
Mumbai
Bangalore

A Manhattan of our own: All the new cities will have international-quality roads, telecom networks and other amenities like the famed Palm City of Dubai

Cities near Mumbai, Delhi

Located on the outskirts of Mumbai and in Gurgaon, Haryana, spread across 20,000 acres each

Investment of $10 billion in the first phase

Investor: Limitless LLC, a Dubai government firm, and DLF Ltd

Science city near Bangalore

About 400km from Hyderabad and 150km from Bangalore

Investment of $25 bn, spread across 65,000 acres, over 10 years

Investors: Macquarie Bank, Australia, and Singapore's Jurong Corp and Semb Corp

Mini city near Hyderabad

A 400 acre commercial and residential development on the outskirts of Charminar city

Will house 30,000 people, shops, and cultural amenities

Investors: Tishman Speyer, ICICI Bank, Nagarjuna Construction

Growth to boost need for homes

Foreign funds are moving into real estate because the 9-10 per cent economic growth foreseen will explode demand for homes, commercial space. House prices in Mumbai, Delhi, and Bangalore have more than tripled since 2004.

Four cities will appear on the Indian map

Foreign funds will pump in Rs2 lakh crore to create the ultra-chic cities

Raj Nambisan & Priti Bajaj.
Mumbai. New Delhi

On Republic Day this year, Macquarie Bank, Australia's largest securities firm, announced that it will invest $25 billion along with three partners to create an ultra-modern integrated township on 65,000 acres in Andhra Pradesh, just 170km off Bangalore.

Four weeks later, Tishman Speyer Properties LP, which owns New York's famous Rockefeller Centre and Frankfurt's MesseTurm, said it, along with ICICI Bank and Nagarjuna Construction Co, will build a $2 billion residential and commercial township for 30,000 people, spread over 400 acres near Hyderabad.

On Monday, or exactly another four weeks after the Tishman announcement, Al Nakheel LLC, an international property development firm owned by the Dubai government said it will, along with DLF Ltd, build two 'Manhattans' near Mumbai and Gurgaon, spread over 20,000 acres each.

Each city will cost about $10 billion or Rs43,300 crore to construct, with the first phase, expected to be completed by 2010, seeing the partners investing $5 billion apiece.

In all, $47 billion or Rs203,000 crore of private money will be invested over the next couple of years to create four ultra modern cities from ground up.

The cities near Mumbai and Gurgaon will be three times as large as New York's Manhattan Island, DLF said.

All the four cities will be world-class and self-contained, with wide, international-quality roads, telecom networks, educational institutions, industrial clusters, hospitals and amusement parks.

International Finance Tech-City, Gujarat

Source: Indian Skyscraper Blog, Wordpress.com

Unitech Grande, Noida

Source: SkyscraperPage.com

MARG Swarnabhoomi, Chennai

Source: Marg Swarnabhoomi

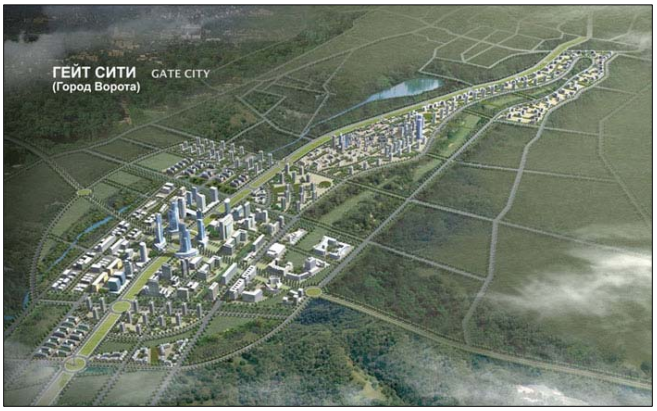
Source: Skyscraper City

Kazakhstan

Aktau City

Source: Skyscraper City

G4 City – Gate City



G4 City – Gate City

G4 City – Growing City

G4 City – Gate City

Source: Caspian Investments

Pakistan

Karachi Waterfront

Source: Pakistan Uncut

Cambodia

Phnom Penh New Town

Source: World City Co.

Malaysia

International Halal Park, Selangor

Source: AMEinfo

Danga Bay Global City

Source: Danga Bay

Singapore

One North

Source: Condo Singapore

Vietnam

Halong Star, Halong Bay

Source: Limitless

Thu Thiem New Urban Center, Ho Chi Minh City

Source: Ho Chi Minh government

Source: Skyscraper City

Western West Lake, Hanoi

Source: Skyscraper City

Ciputra Hanoi International City

Source: Ciputra Hanoi

China

Dongtan Eco City

Source: USA Today

Tianjin Eco-City

Source: Luxury Asia Home

Qianjiang Century CBD

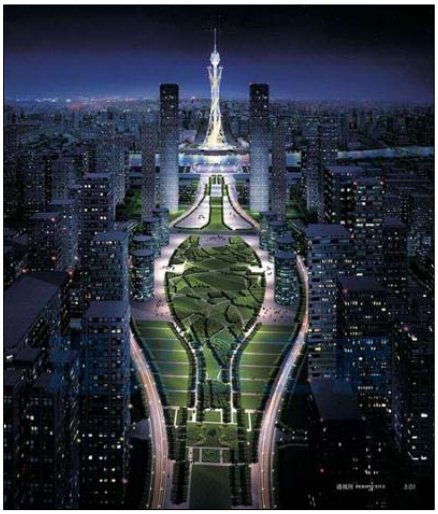
Source: Qianjiang Century CBD

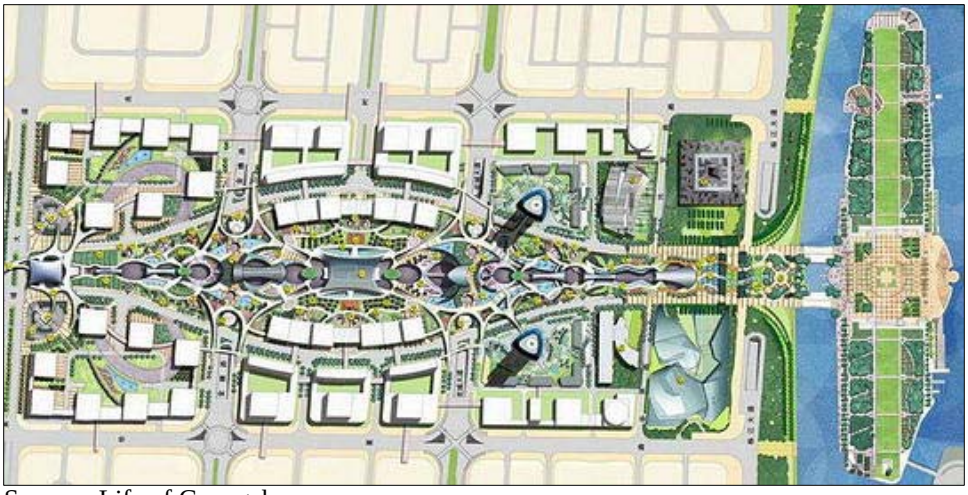
Wuhan CBD

Source: Skyscraper City

Zhujiang New Town

Source: Con Expo Asia





Source: Life of Guangzhou

Tangshan Eco-City

Source: Ecocity Media

Hong Kong

Kai Tak Archipelago

Source: HOK Architects

South Korea

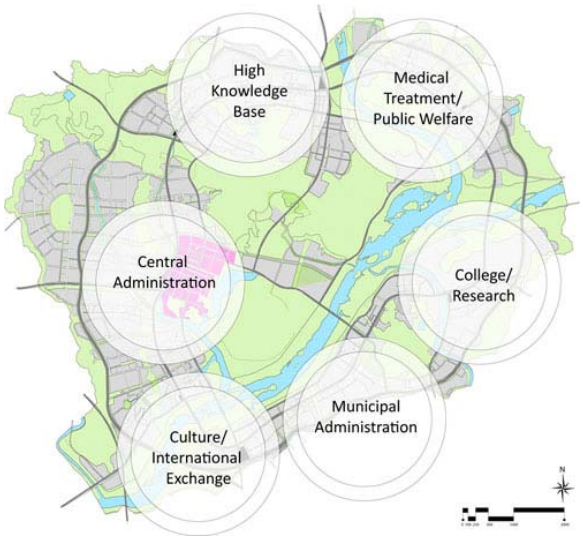
New Songdo City

Source: Skyscraper City

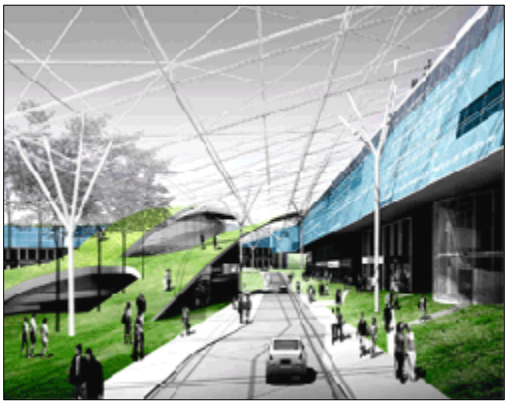
Source: HOK

Source: Skyscraper City

Sejong City



Source: Planning.org



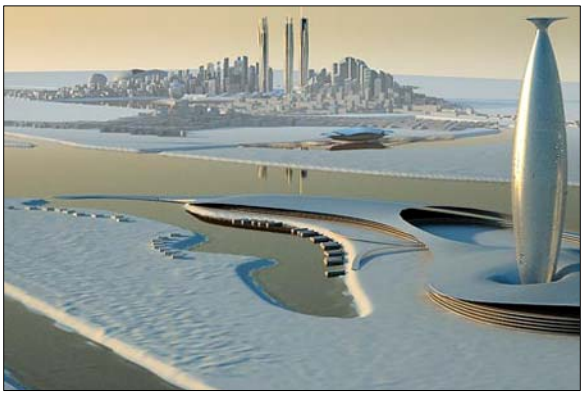
Source: Korea.net

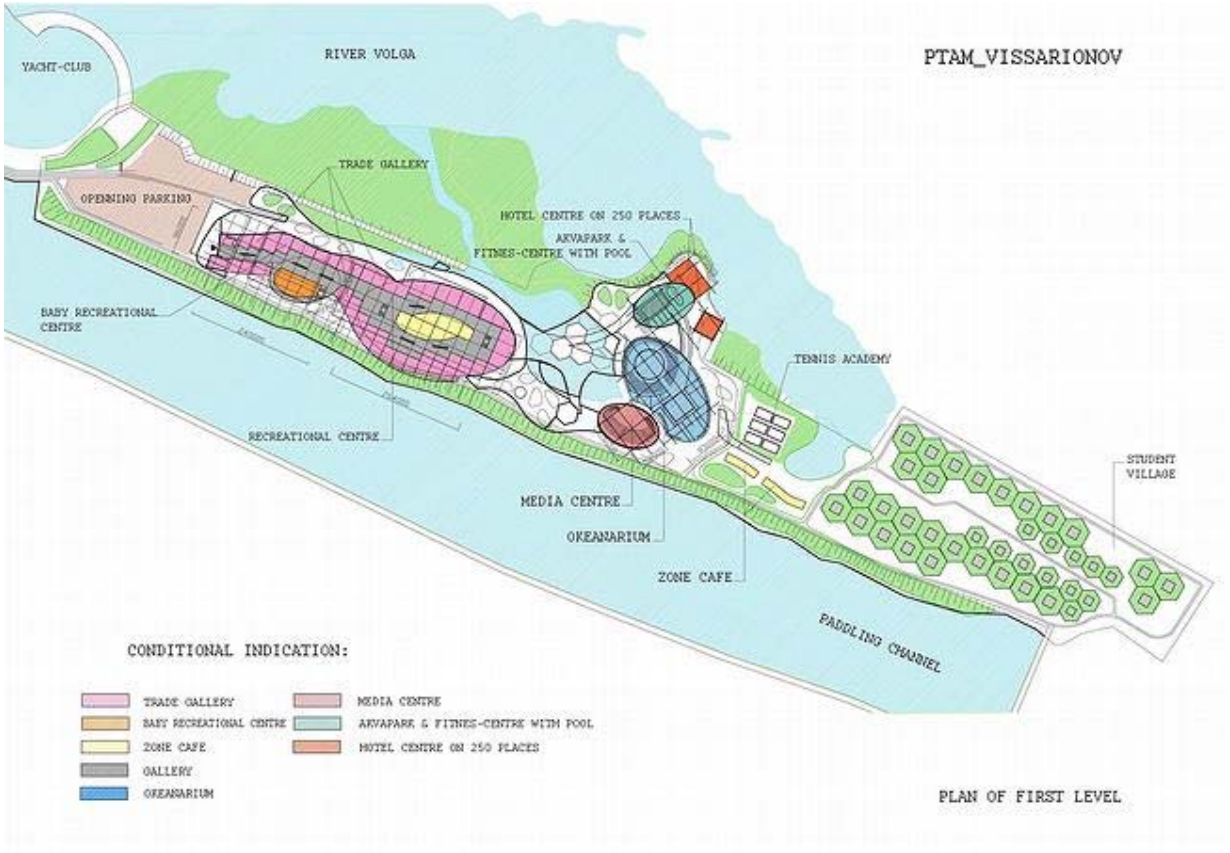
Millennium City/Digital Media City

Source: Seoul News

Russia

Globe City, Nizhny Novgorod

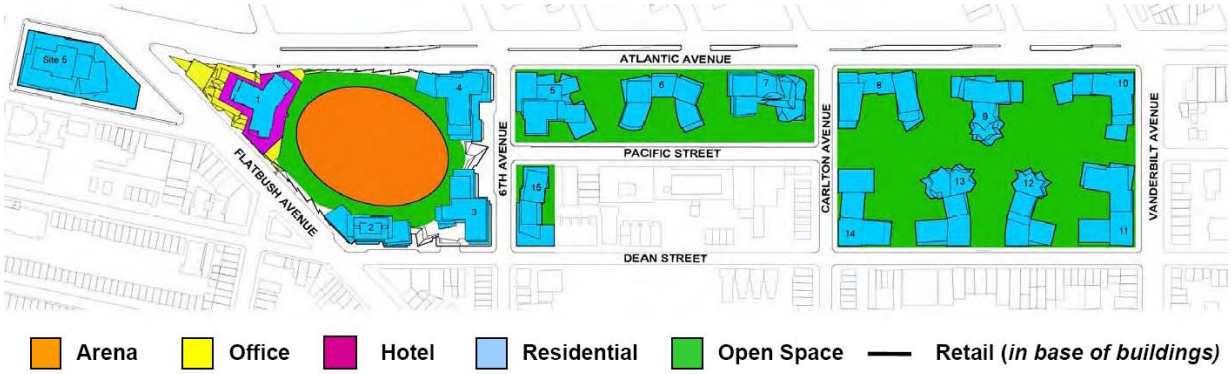




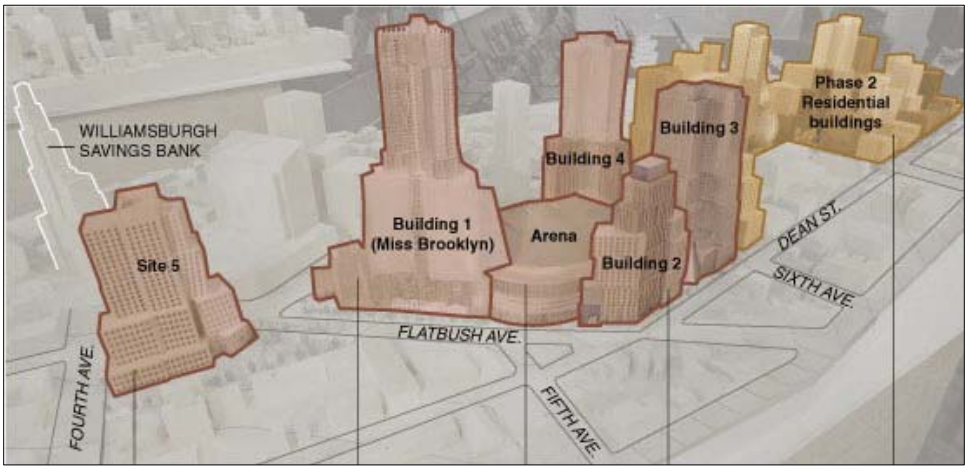
Source: Skyscraper City

United States

Atlantic Yards, New York

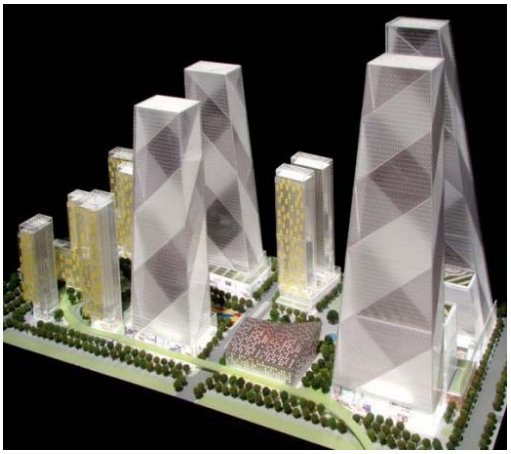


Source: Atlantic Yards



Source: Curbed.com

Hudson Yards, New York



Source: Curbed.com

Stapleton, Colorado

Source: Stapleton Development

United Kingdom

Liverpool Waters

Source: Peel Holdings

Wirral Waters

Source: Peel Holdings

Media City, Salford Quays

Source: Peel Holdings

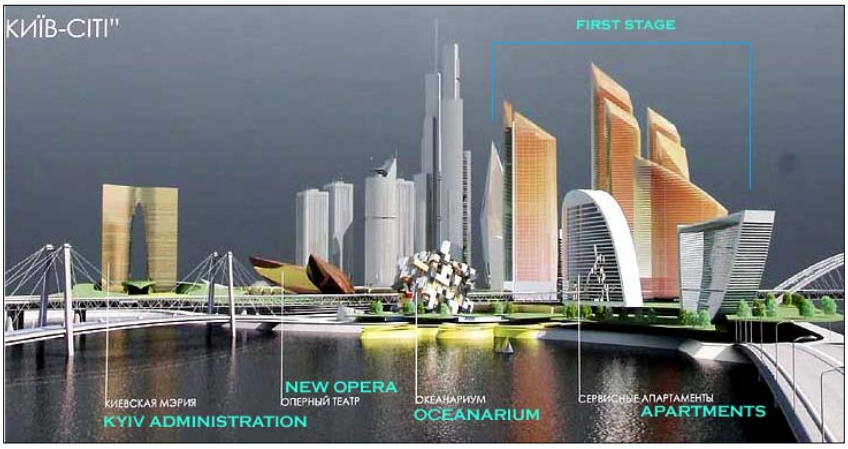
Netherlands

Zuidas, Amsterdam

Source: Connected Cities

Ukraine

KIEV



Source: Skyscraper City

Appendix 3 – Profiles of Megacity Developers

Abu Dhabi

ALDAR

ALDAR is one of the largest conglomerates in the Middle East, with interests in real estate investment, development, leasing and property management; ownership and management of shopping malls; ready mix concrete production and construction services; district cooling systems; health care and hospitality services; retail and corporate financing. Aldar Properties, formed in 2005, now has the largest portfolio of projects in Abu Dhabi, and with 34 square kilometers of land available for development, one of the largest land banks in the Gulf. It has over 37 real estate development projects underway, many of which are integrated or adjacent to megacity developments led by the larger master developers.

ALDAR raised US $224 million, 55% of the company's equity, when it listed its shares on the Abu Dhabi Stock Exchange in October 2004, and has over 20,616 investors throughout the UAE. ALDAR's principle corporate shareholders include:

- Mubadala Development Company/Abu Dhabi Government (17%)
- Abu Dhabi Investment Company
- Abu Dhabi National Hotels Company
- National Corporation for Tourism & Hotels
- The National Investor

Maximum foreign ownership allowed is 40% (AMEinfo, 2007). In August 2006, the firm formed the US $138 million Aseel Finance Company, a joint venture with First Gulf Bank, Sorouh Real Estate and Reem Investments. The firm recently announced plans to raise at least US $816 million to fund new projects by selling Islamic bonds (Bloomberg, 2008). The Chairman of the firm is Ahmad Ali Al Sayegh.

Mubadala Development Company

Mubadala Development Company is an investment and development arm of the government of Abu Dhabi, with a diversified portfolio that includes large-scale industry ventures in energy, the heavy industries, telecommunications, infrastructure and aerospace in the Middle East/North Africa (MENA) region and growing international investments in Switzerland, Italy, the United States, the Netherlands and Malaysia. Organized in October 2002, the firm has over 30 subsidiaries in almost every business type. Mubadala is an equity investor in twelve international businesses, including a 4.2% interest in Abu Dhabi based ALDAR Holdings—the largest single shareholder, and direct interests in thirteen real estate and infrastructure projects. It is also the sole financier of Abu Dhabi Future Energy Company (ADFEC) and the Masdar initiative. Crown Prince HH Mohammed Bin Zayed Al Nahyan is the company chairman.

- **Abu Dhabi Future Energy Company** (ADFEC) is a private joint stock company established in Abu Dhabi and is wholly owned by Mubadala Development Company, investment vehicle for the government of Abu Dhabi. Under government mandate, ADFEC will execute the Masdar initiative to leverage Abu Dhabi's substantial resources and expertise in global energy markets into the energy technologies of the future. The strategy includes development and commercialization of renewable energy, energy efficiency, carbon management and monetization, and water usage and desalination technologies. Established in 2006 and headed by Dr. Sultan Ahmad Ali Al Sayegh, the initiative also includes development of zero-carbon Masdar City.

Reem Investments

Reem Investments is an Abu Dhabi-based private equity company with interests in real estate and pre-IPO start-ups in high growth industries. Its initial paid in capital was US $423 million. Through its Reem Developers subsidiary, the firm holds a 20% interest in Abu Dhabi's ambitious Al Reem Island development, and where it will develop its first start-up, wholly funded project called Najmat Abu Dhabi.

Sorouh

Sorouh Real Estate Company one of the largest publicly listed Abu Dhabi-based real estate developers, second only to ALDAR. Established in June 2005 it was organized with the purpose of developing real estate projects in Abu Dhabi with a vision of turning the Emirate into a regional leisure, business and lifestyle destination. Sorouh plans to expand its activities beyond Abu Dhabi and across the rest of the UAE. The firm has nine subsidiaries and affiliates in the UAE, and 23 real estate developments underway in the UAE and Morocco, the largest of which is Shams Abu Dhabi on Al Reem Island, in which it holds a 25% interest.

The firm's shares were listed on the Abu Dhabi Stock Exchange in December 2005, raising US $374 million for 55% of the company's equity, and is one of the most widely held issues with approximately 55,000 shareholders in the UAE. Originally held to 20%, maximum allowable foreign ownership was recently raised to 40% (AMEinfo, 2007). In March, Sorouh announced it plans to sell $1bn of Shariah compliant asset backed securities to help fund expansion (Arabian Business, 2008) Sorouh's Chairman is Saeed Eid Al Ghafli.

Tamouh Investments

Tamouh was established 2005, but already has established itself as a significant player in Abu Dhabi real estate development. It is the primary developer on a number of key projects, including its 55% interest in Abu Dhabi's Al Reem Island, where it will develop two huge mixed-use residential/commercial projects, Marina Square and City of Lights.

Dubai

DAMAC Properties

DAMAC Properties is part of DAMAC Holdings, with residential, leisure and commercial developments in Dubai and the Middle East, and in North Africa, Jordan, Lebanon, Qatar, Saudi Arabia and the Far East. The company's portfolio includes properties spread across 670 million square feet and is worth in excess of

US$45 billion. DAMAC's largest project is Nusajaya, a new master developed urban district in South Johor Malaysia.

Dubai City of Aviation Corporation

Renamed Dubai World City in 2005, Dubai City of Aviation Corporation is the government owned developer of the 'Urban Aviation Community' surrounding the new Dubai International Airport. It is an integrated logistics development that encompasses the airport, a logistics free trade zone as well as commercial, residential and recreational city centers. Dubai World is the sole developer of the entire project, including Al Maktoum International Airport, Dubai World Central Aviation City, Dubai World Central Commercial City, Dubai World Central Golf City, and Dubai World Central Residential City. Chairman of the venture is HH Sheikh Ahmad Bin Saeed Al Maktoum.

Dubai Holding

Formed in 2004, Dubai Holding is a Dubai based privately owned conglomerate involved in healthcare, technology, real estate, financial services, education, telecommunications, entertainment and leisure, industrial manufacturing, hospitality and aerospace. Under the leadership of Chairman Mohammed Bin Abdullah Al Gergawi, Dubai Holding operates through three primary subsidiaries: Dubai Group, Dubai International Capital and Dubai Holding Commercial Operations Group. Most of Dubai Holdings' real estate activities are controlled through five subsidiaries--Dubai Properties Group, Jumeirah Group, Sama Dubai, TECOM Investments and Tatweer--summarized below.

- **Dubai Properties** is involved in real estate development and leasing; construction of shopping malls, hotels and retail markets; asset, facility and property management; security services; provide employee training programs. It has eight subsidiary businesses and is involved in 15 different real estate developments in the UAE. It is a private LLC formed in 2002.
- **Jumeirah Group** provides hotel, resorts and real estate development and management. Founded in 1997, the private LLC is led by Executive Chairman Gerald Lawless. Subsidiaries include Burj

Al Arab and Jumeirah International, with Jumeirah projects in the UAE, China, Qatar, Thailand and Bermuda.

- **Sama Dubai** was formed in October 2004 to pursue real estate investment and development primarily in countries outside the UAE. It is currently developing projects in Morocco, Turkey, Bahrain, Tunisia, Oman, India and Malta. Sama Dubai is partnering with TECOM to build SmartCity, a global network of self-sustained townships for knowledge-based industries based on the model of Dubai Internet City, Dubai Media City and Dubai Knowledge Village.
- **TECOM Investments** is primarily involved in owning and operating free trade zones, educational institutions and research centers, telecommunications, film, and media and broadcasting services. Its 23 subsidiaries operate in the UAE, Malta, Cayman Islands, the UK, Greece and Tunisia. Direct involvement in real estate development is mostly limited to SmartCity, the joint partnership with Sama Dubai. It was formed as a company in 2000.
- Formed in December 2005, **Tatweer** is primarily involved in management and development of a portfolio of Dubai Holding companies in the UAE involved with energy and healthcare, tourism and entertainment, industry and knowledge. Notable subsidiaries include Dubailand, Dubai Energy City, Dubai Healthcare City, Dubai Industrial City, Global Village, and Tiger Woods Dubai.

In March 2007, Dubai Holding received from Emaar 2.364 billion new Emaar shares in lieu of land, thus forming an important relationship between two of Dubai's largest developers (Zawya Information, 2007).

Dubai World

Dubai World is one the Middle East's largest conglomerates, with interests spanning four strategic growth areas-- Transport & Logistics, Dry docks & Maritime, Urban Development and Investment & Financial Services. This includes DP World, one of the largest marine terminal operators in the world; Drydocks World & Dubai Maritime City designed to turn Dubai into a major ship-building and maritime hub; Economic Zones World which operates several free zones around the world; Nakheel the property developer behind iconic projects such as The Palm Islands and The World among others; Limitless the

international real estate master; Leisurecorp a global sports and leisure investment group; Dubai World Africa which oversees the regional development and portfolio of investments in the African continent; and Istithmar World, the group's investment involved in finance, capital, leisure, aviation and other business ventures.

Structured as a government owned joint stock company, Dubai World was formally established in March, 2006 and has 50,000 employees throughout its extensive holdings. The chairman of the firm is HE Sultan Ahmad Bin Sulayem.

- Formed in 2001 as a government LLC, **Nakeel** is a large, wholly owned subsidiary of Dubai World. In late 2007 it was merged with Dubai World's Istithmar Real Estate, joining together US $52 billion of existing real estate projects (Arabian Business, 2007). The combined firm has 28 subsidiaries, involved in real estate investment, development and brokerage services; design and engineering services; shopping mall development and management; ownership and management of hotels, travel and tourism agencies; aviation services; health and safety services; asset management.

  Nakheel now has over 50 real estate projects in development, including The Palm at Deira, Lebel Ali and Jumeirah; The World, and has interests in numerous other Jumeirah and Trump branded developments. The firm has 2,500 employees company wide, and the Chairman is HE Sultan Ahmad Bin Sulayem.

- **Limitless** is wholly owned subsidiary of Dubai World, set up in 2005 as a government LLC. While organizationally smaller than Nakheel, Limitless currently has $100 billion in real estate under development, including such high profile projects as Downtown Jebel Ali, the Arabian Canal, Al Wasl in Saudi Arabia, Halong Star in Vietnam, and the International Halal Park in Malaysia.

With initial capital from Dubai World, Limitless recently announced it has secured $1.2 billion syndicated loan with 18 banks from the Middle East, Asia and Europe. The 2-year, Sharia-compliant UAE/USD dual tranche facility forms part of Limitless' global funding strategy for current and future projects (AMEinfo, 2007). Chairman of the firm is HE Sultan Ahmad Bin Sulayem.

Emaar

Emaar Properties it the world's largest publicly traded property developer with a market capitalization of US $25 billion, and was the first real estate developer to provide freehold property in Dubai. The firm is a global conglomerate involved in real estate investment, development and property management; general contracting; commercial banking and mortgage finance; health care; education; leisure; retail; hospitality and information technology and data communication services. Emaar has over 60 subsidiaries and affiliates throughout the United Arab Emirates as well as in Morocco, Algeria, Syria, Pakistan, Jordan, Saudi Arabia, India and Indonesia. It has over 50 development projects currently underway, including such megacity projects as Downtown Burj Dubai, Burj Dubai Boulevard, Dubai Marina, and the King Abdullah Economic City in Saudi Arabia.

Emaar was established in 1997 as a public joint stock company with initial capital of US $274 million. In March 2000 it listed on the Dubai stock exchange and in June 2005 doubled its share capital through a rights issue, raising foreign ownership of the stock from 20% to 49%. In March 2007, Emaar issued 2.364 billion new shares to Dubai Holding in lieu of land, thus forming an important relationship between two of Dubai's largest developers.

Emaar announced in November 2007 its plan for a US $40 billion share listing on the London Stock Exchange. The Chairman of the Dubai based firm is Sheikh Mohammed Bin Ali Rashid Al Abbar, who is also the Director General of Dubai Department of Economic Development. The Dubai government retains a 32% equity stake in the firm.

Tameer Holding Investments

Tameer has a project portfolio of over 30 landmark property developments in Dubai, Jordan, Libya and Saudi Arabia, including Tameer Towers at Shams Abu Dhabi on Al Reem Island; The Gate Towers, a joint venture with Sorouh; Princess Tower in Dubai Marina, one of the world's highest residential structures; and the technologically advanced Platinum Towers at Business Bay. The firm recently entered a strategic partnership with the Al-Rajhi Investment Group to help fund future growth.

Jordan

Saraya Holdings

Saraya is a privately held, Jordan based holding company with interests in real estate investment, development and brokerage services, asset management, aviation and related services. Through its Millennium Development International (MDI) subsidiary, Saraya is involved in hospitality and mixed use real estate development, land development and property management, including Aktau City, a new metropolis being built in Kazakhstan, and Nusajaya, an new urban district in South Johor Malaysia.

Lebanon

Solidiere

The Lebanese Company for the Development and Reconstruction of Beruit Central District, popularly known as Solidere, focuses on urban planning and infrastructure development. It manages and sells plots in the Beirut city center where it also is a landlord offering residential and commercial units for lease. The company is also engaged in real estate development outside of Lebanon through its affiliate, Solidere International.

Solidere was founded by former prime minister Rafik al-Hariri to rebuild Beruit redeveloping a 191-hectare area in the urban core of the Lebanese capital. This area, the Beirut Central District (BCD) had been

devastated in the 1975 to 1989 Lebanese conflict. Solidiere's mission was to rebuild historic portions representing 12% of the area and newly develop the remainder. While a commercial company listed on the Beirut Stock Exchange, Solidere enjoys a monopoly status as a state-backed enterprise that was authorized upon its establishment to claim BCD properties in exchange for compensation through shares in the company.

Knowing that its decreasing land bank and progress in BCD development would reduce the company's original role, Solidere management in 2006 obtained shareholder approval to venture into urban planning and real estate development outside of Lebanon. The firm entered project partnerships in the UAE and Egypt and founded Solidere International (SI), becoming managing shareholder with 37% ownership when SI was incorporated in July 2007 in Dubai as a regional developer with US $770 million in capital. Today, Solidiere has six subsidiaries and twelve real estate projects in development, under the chairmanship of Nasser Al Chammaa.

Qatar

Qatari Diar

Qatari Diar is fully owned by the Qatar Investment Authority and was founded to support Qatar's rapidly expanding economy and to provide structure for the country's real estate development, "realizing the country's vision for a beautiful built environment, new sustainable communities and developments which catch the imagination of a world audience." Capitalized at US$1 billion and only launched in March 2005, the company currently has 18 projects underway, including the $US 50 billion Lusail project in Qatar.

Saudi Arabia

Tanmiyat Investment Group

Tanmiyat develops large-scale mixed-use real estate projects throughout the Middle East. Its goal is to becoming the leading real estate investment and development firm within Saudi Arabia and abroad. The firm has eight business subsidiaries, and extensive real estate holdings, with 11 real estate projects under development in Saudi Arabia, the UAE, and Turkey. Its largest current project is Ajman Marina in the UAE.

Sharjah

Al Hanoo Holding Company

Al Hanoo is a Sharjah based holding company with interests in real estate investment and development; building contractors; gas and electrical network installations; trade in spare parts, pumps, tractors and other agriculture related machinery; and central irrigation system services. Founded in 1972, the firm has established subsidiaries in Saudi Arabia but its most ambitious real estate projects to date are Emirates Industrial City and Nujoom Island, a new urban district development in coastal Sharjah.

India

DLF

DLF is the largest real estate developer in India. The group has over 224 million sq. ft. of existing development and 748 million sq. ft. of planned projects. Its core business is divided into three parts: residential, office and retail. In recent years, DLF has added more divisions: hotel (over 25,000 rooms in more than 40 cities in process), infrastructure, IT parks and special economic zones (SEZs). Executive Chairman Kushal Pal Singh was a pioneer in building modern office parks to house offshore call centers for Western multinationals, beginning with a 50,000 square foot center for General electric. But DLF Group

was formed much earlier, in 1946, and built many of the first residential colonies in Delhi. DLF's first landmark real estate development project was DLF City.

Today, DLF has holdings in 32 cities across 18 states in India. Armed with 10,000-odd acres, DLF plans to build over the next 10 years more than double the area it has developed over the past 60 years (Rediff News, June 2007). The aggressive expansion plans include developing 'New Manhattans' in Delhi and Mumbai in a 50/50 partnership with Dubai based Nakheel, and the building Bidadi Knowledge City in Bangalore in a 50/50 partnership with Dubai's Limitless.

Unitech Group

The largest listed real estate company in India and second in overall size only to DLF, Unitech has over 3 decades of experience in real estate development throughout India. Interests include residential, commercial, retail, entertainment, hospitality projects and special enterprise zones (SEZs). The firm currently has under development over 20 residential projects totaling 25 million square feet, 21 million square feet of commercial, numerous proposed retail and entertainment projects, and 28 hotel properties. Unitech recently received in-principle approval for 3 large (over 10,000 acres each) special economic zone projects in Kundli (Haryana) and Haldia (West Bengal). Its largest single real estate undertaking is Unitech Grande, a new urban district in Noida. Chairman of the firm is Ramesh (Sanjay) Chandra.

Marg Limited

Marg is a relative newcomer to real estate development in India. Founded in 1994 by entrepreneur G.R.K. Reddy it has quickly become dominant player in Chennai and surrounding provinces. The firm played a significant role in developing the Chennai IT corridor, and is today involved in development and management of utilities, special economic zones (SEZs), ports, townships, IT parks, malls, airports, hotels, apartments, resorts, and roads. Marg has developed seven major utility infrastructure projects, and nine real estate projects. Its most ambitious program is Marg Swarnabhoomi, a new urban district on the Eastern seacoast of India that includes redevelopment of Karaikal Port. Marg Swarnabhoomi will be funded in part by floating shares in a special purpose vehicle (SPV) called New Chennai Pvt Limited.

China

China Vanke, Ltd.

China Vanke Co., Ltd., together with its subsidiaries, engages in the investment, development, management, and sale of real estate, with a focus on commodity housing. Based in Shenzhen China, the firm built its first housing development in Shanghai in 1988, and has since expanded to 20 Chinese cities.

With current revenues of US $4.9 billion, China Vanke is the country's largest mainland-listed property developer. In 2007, China Vanke had 3,068 employees working on more than 100 major building programs in 26 cities, classified into some 230 projects. The Company sold out approximately 6.1 million square meters of property. Unlike most developers, Vanke manages the properties it builds, although it recently formed a joint venture with CB Richard Ellis to co-manage upscale its properties. Vanke also distinguishes itself from its competitors by offering fully finished homes, contrary to the Chinese custom of delivering units unfinished and unfurnished.

Country Garden Holdings Company, Ltd.

Country Garden develops large-scale residential community projects and various types of products, including villas, townhouses, apartment buildings, parking spaces, and retail shops. The company also provides construction, installation, fitting, as well as property management and hotel development. In 2007 Country Garden had 45 projects in progress. Founded in 1997, the company is based in Foshan and had 2007 revenues of US $2.6 billion.

China Greentown Holdings, Ltd.

Greentown is primarily involved in developing large-scale residential properties, high-rise apartments, and villa projects, with operations in Hangzhou, Ningbo, Wenzhou, Shaoxing, and other 10 other cities and provinces throughout China. It also has interest in computer systems design and installation services, construction materials, and hotel operations. Greentown has strategic partnership with the Wharf Group. Founded in 1995, its revenues in 2007 were US $836 million.

Financial Street Holding Co., Ltd.

This holding company is principally engaged in real estate development, property leasing and operation of Beijing's financial street area. In 2007, the Company's total project building area was approximately five million square meters, and approximately 123,000 square meters were sold, which accounted for approximately 88% of the Company's total revenue. The Company operates properties including Ritz Carlton Hotel, The Apartment of Financial Street and Financial Club, as well as leases Financial Street Shopping Centre, the Exchange Walk restaurants and Carnival Plaza. In 2007, approximately 96% of the Company's total US $615 million revenue was from Beijing.

Guangzhou R&F Properties Co., Ltd.

Guangzhou R&F Properties, together with its subsidiaries, is involved in development and sale of residential and commercial properties in China. Its activities also include hotel, office building, and shopping mall development, architecture and construction, and storage and logistics. As of 2007 it had 27 major central city developments under way in Guangzhou, Beijing, Tianjin, Xian, Chongqing, Hainan, Chengdu, Kunshan, Shenyang, Shanghai, and Taiyuan.. The company was founded in 1994 and is headquartered in Guangzhou. Total revenues in 2007 were US $2.1 billion.

Shimao Property Holdings, Ltd.

Holding company Shimao Property develops and invests in real estate projects throughout mainland China, including residential, retail, office, hotel properties and shopping centers. In 2007 the company had over 34 projects in various stages of development in 21 major cities. Revenues in 2007 were US $2.7 billion, and the firm is based in Hong Kong.

Xinyuan Real Estate Co., Ltd

Xinyuan develops large-scale residential real estate projects aimed at middle-income consumers in China's Tier II cities: Hefei, Jinan, Kunshan, Suzhou, Zhengzhou and Chengdu. It specializes in projects consisting of multiple residential buildings that include multi-layer apartment buildings, and sub-high-rise

or high-rise apartment buildings, as well as auxiliary services and amenities comprising retail outlets, leisure and health facilities, and kindergartens and schools. The firm has completed 14 projects with a total of 1 million square meters within the past ten years, has eight projects under construction totaling 1.2 million square meters, and five additional projects in the planning stages. Xinyuan is the first real estate developer from China to be listed on the New York Stock Exchange. Total 2007 revenues were US $307 million.

Hong Kong

Agile Property Holdings, Ltd.

Agile is engaged in developing large-scale residential projects, hotels, shopping malls and grade A commercial buildings. As of December 31, 2007, it owned 51 property projects in 18 cities throughout China. The company offers a range of property types, including low density residence, apartments, high-rise buildings, and commercial complexes. It currently controls 28 square kilometers of land. 2007 revenues were US $1.5 billion.

China Resources Land, Ltd.

Listed on the Hong Kong exchange in November of 1996, China Resources Land Limited is the real estate holding company of China Resources Group. Its major business is development and management of residential and investment properties in mainland China. Its revenue in 2007 was US $718 million. Besides owning various promising projects in Beijing, China Resources Land has invested in first and second tier cities such as Shanghai, Shenzhen, Chengdu, Wuhan and Hefei. It also owns a significant number of shares in China Vanke, Ltd., and is itself part of US $6.5 billion China Resources Enterprises.

China Overseas Land & Investment, Ltd.

China Overseas Land & Investment is involved in real estate investments, development, management services infrastructure, supply of heat and electricity, securities trading, and manufacture and sales of cement. The Company's property development, property investment and other activities are carried out in

Hong Kong, Macau and regions in of China, as well as the India and the UAE. It targets high-end customers in the cities, and its competitiveness comes from continuous innovations and brand building. In 2007, China Overseas had over 130 projects in development, involving gross construction area of 22.5 million square meters, and total revenue for 2007 was US $2.1 billion.

Hopson Development Holdings, Ltd.

Hopson develops and manages commercial and residential properties, as well as invests in offices, shops, and car parks throughout mainland China. It also operates the Guangzhou Regal Riviera Hotel, Howard Johnson Hawana Resort, Plaza Royale Hotel Beijing, and the Regal Riviera Hot Spring Resorts in Guangzhou, Beijing, and Tianjin. Further, Hopson Development Holdings engages in the research and development of environmental technology and products. The firm operates primarily in Guangzhou, Beijing, Shanghai, Tianjin, and Huizhou, was founded in 1992, and is based in Hong Kong. Revenues in 2007 were US $1.4 billion.

Henderson Land Development Company, Ltd.

Henderson Land, is involved in real estate activities in Hong Kong and Mainland China, primarily the development and sale of residential and commercial properties, leasing, and mortgage finance. The company also offers construction and invests in various infrastructure projects. The company was incorporated in 1976 and is based in Central, Hong Kong. Revenues in 2007 were US $461 million.

Kerry Properties, Ltd.

Holding Company Kerry Properties a property investment and development company primarily in Hong Kong, China, and the United Kingdom. Kerry is a market leader in the mid-level luxury residential property market in Hong Kong and also owns commercial properties in Kowloon Bay, Central and Tsim Sha Tsui, including Hong Kong's MegaBox. In China, the firm has developed over 21 major projects, focusing on high end, mixed-use developments in key cities, such as Beijing, Shanghai and Shenzhen. Kerry also has holdings in Macao, Australia and the Philippines. 2007 revenues were US $1.8 billion.

Wharf Holdings, Ltd.

Headquartered in Kowloon, and formerly known as The Hong Kong & Kowloon Wharf Company, Wharf Holdings changed its name in 1986. The investment holding company invests in real estate in Hong Kong, Singapore, and China. Its property portfolio comprises office, retail, serviced apartments, and hotels and clubs. It also owns shipping terminals, and is involved in hotel development, public transportation, and media. Its flagship properties are Harbour City in Kowloon and Times Square in Hong Kong. It develops residential, office and mixed-use projects throughout the China region by way of its Wharf Estates subsidiary. 2007 revenues were US $2.2 billion.

Singapore

CapitaLand, Ltd.

Headquartered in Singapore, CapitaLand's activities include residential, commercial and mixed-use real estate development, hospitality and real financial services, with a portfolio that spans more than 110 cities in over 20 countries. The residential group has properties in Singapore, Australia, China, Vietnam, Malaysia, Thailand and India. The commercial group leases and manages commercial spaces in Singapore, China, Hong Kong, Malaysia, Bahrain and the United Kingdom. The retail group owns and manages a portfolio of more than 92 malls in Singapore, China, India, Japan and Malaysia. In 2006, CapitaLand also formed an integrated leisure, entertainment and conventions group to develop resorts. The firm is developing the new Bahrain Bay in Bahrain. In 2007 CapitaLand's revenue was US $2.7 billion.

Keppel Land Ltd.

Together with its parent company, Keppel Corporation, Keppel Land operates as a property development company in Asia. The firm, formerly known as Straits Steamship Land Limited, was founded in 1890 and is headquartered in Singapore. It is involved in offshore and marine infrastructure and property businesses, including office buildings, residential properties, hotels and resorts, serviced apartments, shop houses and retail outlets, and industrial buildings. Keppel owns 158,000 square meters of rentable commercial space, and its hotel and resort portfolio includes ten hotels, serviced apartments, and resorts with approximately

2,000 rooms. It has also embarked on developing large-scale townships in regions with demand for quality housing from the growing middle-class population. The group has a pipeline of about 40,000 homes in residential townships across China, Vietnam and Indonesia. Keppel Land is also leading the joint venture to develop Sino-Singapore Tianjin Eco-city in Tianjin China. It had had 2007 revenues of US $1 billion.

Korea

Daewoo Engineering & Construction Co., Ltd., Korea

Daewoo Engineering was founded in 1973 and is based in Seoul, South Korea. Operating as a subsidiary of POSCO Engineering & Construction Co., Ltd., Daewoo Engineering provides engineering and construction services to civil and housing developments, power and industrial plants, architecture, liquefied natural gas (LNG) facilities, and overseas projects. It operates in four divisions: the Civil Business division, the Plant Business division, the Building Works division, and the Housing Business division. The Civil and Plant Businesses division focus mostly on infrastructure construction. The Building Works division constructs office, mixed-use hotel, leisure and commercial, educational and medical facilities, exhibition space, residential and commercial mixed-use, and factory buildings. The Housing Business division's activities include construction of apartments, redevelopment/reconstruction, villas and resort development. Daewoo Engineering is currently partnered with Gale International to build the US $25 billion New Songdo City. 2007 revenues were US $6 billion.

United States

Forest City Ratner

Forest City Ratner is among the largest commercial real estate developers in New York City, and a subsidiary of US $1.2 billion Forest City Enterprises. The parent company develops and manages more than 95 retail and office properties and hotels, and nearly 20 regional malls in 15 states. Residential interests include more than 110 upscale and middle-market apartments, condominiums, and military family housing units in 20 states. Forest City Ratner oversees a portfolio of more than 6 million sq. ft. of office,

retail, hotel, and residential on the east coast, and has an additional 3 million sq. ft. of commercial real estate under development or construction. Its largest project to date is the US $4 billion 22-acre Atlantic Yards redevelopment, a mixed-use project that also includes a Frank Gehry designed basketball arena. The project's expected completion date is 2010**.**

The Related Companies

Related was founded in 1972 as a real estate developer for government-assisted housing in the New York City area. Now it develops high-end residential, commercial, and mixed-use projects all over the US. The US $3 billion company operates in three divisions - development, management, and financial. It has developed about 35,000 apartments and more than 4 million sq. ft. of commercial space. The firm now has more than 100 properties in its portfolio, from upscale apartment towers across Manhattan and Chicago to urban retail and residential centers in Phoenix, Los Angeles, and Florida. Related recently entered a joint venture with Goldman Sachs to create The Hudson Yards, a 26-acre mixed-use redevelopment project on Manhattan's West Side. The Hudson Yards will offer affordable housing, parks and public space, and office and retail space in a sustainable design environment.

The Gale Company

Gale offers land development, property management, and asset management services, as well as general contracting and construction management services through its Gale Construction division. The firm's property portfolio primarily consists of Class A office space in the Northeast. It has developed more than 20 million sq. ft. of commercial office and warehouse space and invests in property through joint ventures with such financiers as Morgan Stanley and J.P. Morgan. The Gale Company is a subsidiary of Mack-Cali Realty, which acquired the firm in 2006. Its largest project to date is development of New Songdo City, a new US $25 billion megacity being built near Seoul, South Korea.

United Kingdom

Peel Holdings

Peel owns, develops, and manages properties, including canals and regional airports, in the UK. The firm is comprised of four divisions -- Trafford Centre (a suburban shopping megaplex in greater Manchester); Peel Land & Property (business parks, land investments, advertising, telecommunications, and utilities); Peel Airports (airports in Durham Tees, Liverpool, and Sheffield); and Peel Ports (Clydeport, Manchester Ship Canal, and the Mersey Docks and Harbour Company). A group of shareholders controlling Peel Holdings took the firm private in 2004.

Its most recent large scale projects are Wirral Waters, a 150 acre ocean-front commercial and residential site at the port of Liverpool, and Liverpool Waters, and adjacent mixed-use development. Together, the projects will cost US $ 19.5 billion. Once completed, the new area will have more than 20,000 new homes, hotels, and a host of retail establishments all connected to Liverpool's John Lennon Airport via a monorail.

Appendix 4 – Gulf Region/India Developer Data

Firm Name	**ALDAR Properties**
a.k.a.	ALDAR
Country	Abu Dhabi
Principal Activities	Real estate investment, development, leasing and property management; ownership and management of shopping malls; ready mix concrete production and construction services; district cooling systems; health care and hospitality services; retail and corporate financing.
Date Established	2004 (July)
No of Employees	13,000 (380 Company, 13,000 Group)
Exchange	Abu Dhabi SE
Symbol	ALDAR
Chairman	Ahmad Ali Al Sayegh
Financing	Aldar raised USD224 million when it listed its shares on the Abu Dhabi Securities Market in October 2004 for 55% of the company's equity. . In August 2006, Aldar established the USD138 million Aseel Finance Company, as a joint venture with First Gulf Bank Sorouh Real Estate and Reem Investments.
Total Projects in Development	65B

Subsidiaries/Associates/Affiliates

Name	Location	Holding
ALDAR Academies	UAE	100.00%
ALDAR Commercial Property Developments	UAE	100.00%
ALDAR Facilities Management	UAE	100.00%
Al Jimi Mall	UAE	100.00%
Al Raha Gardens Property	UAE	100.00%
Al Raha Infrastructure Company	UAE	100.00%
ALDAR Real Estate Services	UAE	99.00%
ALDAR Laing O'Rourke Construction	UAE	51.00%
A and T Cool	UAE	50.00%
Coconut Island Development Company	UAE	50.00%
Fadar Retail	UAE	50.00%
Royal House	UAE	50.00%
Abu Dhabi Motor Sports Management	UAE	40.00%
Dimarco	UAE	34.00%
Al Maabar Investments	UAE	30.00%
Aseel Finance	UAE	20.00%
Green Emirates Properties	UAE	20.00%
Inshaa Properties	UAE	20.00%
ALDAR Hotels and Hospitality	UAE	-
ALDAR Readymix	UAE	-
Imperial College London Diabetes Center	UAE	-

Developments and Projects

Name	Location	Holding
Al Falah	UAE	100.00%
Al Gurm Resort	UAE	100.00%
Al Raha Beach	UAE	100.00%
Central Market [in Downtown Abu Dhabi]	UAE	100.00%
Mina Zayed Port	UAE	100.00%
Abu Dhabi Plaza - Astana	Kazakhstan	-
Al Bandar	UAE	-
Al Bateen District	UAE	-
Al Dana [in Al Raha Beach]	UAE	-
Al Khubeira project [in Al Raha Beach]	UAE	-
Al Mamoura Office Complex	UAE	-
Al Muneera [in Al Raha Beach]	UAE	-
Al Nareel Island	UAE	-
Al Ruwais Shopping Center	UAE	-
Al Zeina Mixed-Use Development	UAE	-
Al Zeina [in Al Raha Beach]	UAE	-
Cleveland Clinic	UAE	-
Coconut Island	UAE	-
Crimea Resort	UAE	-

Ferrari World Theme Park [in YAS Island]	UAE	-
Golf Course [in YAS Island]	UAE	-
Intercontinental Hotel [in Al Raha Beach]	UAE	-
International City	Malaysia	-
Moevenpick Hotels and Resorts - Abu Dhabi	UAE	-
Motor World	UAE	-
Noor Al Ain Project [in Garden City]	UAE	-
Oberoi Hotels and Resorts [in Al Raha Beach]	UAE	-
Oberoi Hotels and Resorts [in YAS Island]	UAE	-
Permanent Labor Accommodation Facility	UAE	-
Rotana Hotel - Abu Dhabi	UAE	-
Shopping Mall [in Central Market]	UAE	-
Staybridge Suites	UAE	-
The Abraj Towers	UAE	-
The Pearl Primary School [via ALDAR Academies]	UAE	-
The Ritz-Carlton Abu Dhabi [in Coconut island]	UAE	-
UAE F1 Circuit	UAE	-
Yas Island	UAE	-

Firm Name	**Mubadala Development Company**
Country	Abu Dhabi
Principal Activities	Diversified portfolio, which includes large-scale industry ventures in energy,
Date Established	2002 (October)
No of Employees	150
Exchange	n.a.
Symbol	n.a.
Chairman	Crown Prince HH Mohammed Bin Zayed Al Nahyan
Financing	An investment and development arm of the government of Abu Dhabi.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Abu Dhabi Aircraft Technologies	UAE	100.00%
Abu Dhabi Future Energy Company (Masdar)	UAE	100.00%
Abu Dhabi Knee and Sports Medicine Center	UAE	100.00%
Al Hikma Development Company	UAE	100.00%
Al Taif Technical Services	UAE	100.00%
Al Yah Satellite Communications Company	UAE	100.00%
Horizon International Flight Academy	UAE	100.00%
Liwa Energy	UAE	100.00%
Pearl Energy	Singapore	100.00%
Abu Dhabi UAV Investment Company	UAE	95.00%
Injazat Data Systems	UAE	60.00%
Capitala [via Mubadala Real Estate and Hospitality]	UAE	51.00%
Dolphin Energy Limited	UAE	51.00%
LeasePlan Emirates	UAE	51.00%
Abu Dhabi Terminals	UAE	50.00%
Emirates Aluminium Company Limited	UAE	50.00%
PF Emirates	UAE	50.00%
Abu Dhabi Ship Building Company	UAE	40.00%
SR Technics	Switzerland	40.00%
Agility Abu Dhabi Company	UAE	36.50%
Piaggio Aero Industries	Italy	35.00%
Etisalat Nigeria	Nigeria	30.00%
Tanqia	UAE	30.00%
Al Rusail Power Company	Oman	25.00%
Leaseplan Corporation	Netherlands	25.00%
Shariket Kahraba Hadjret En Nouss Spa [via Algerian Utilities International]	Algeria	25.00%
Emirates Integrated Telecommunications Company	UAE	20.00%
Algerian Utilities International	Algeria	-
Dunia Finance	UAE	-
Mubadala Real Estate and Hospitality	UAE	-

Investments

Name	Location	Holding
Spyker Cars	Netherlands	17.00%
Block 54 Oman	Oman	15.00%
Waha Capital	UAE	14.71%
Libya Exploration	Libya	10.00%
Guinea Alumina Corporation	Guinea	8.33%
Advanced Micro Devices	UAE	8.10%
AMD	United States	8.00%
National Central Cooling Company	UAE	7.93%
The Carlyle Group (Celf Investment Advisers)	UAE	7.50%
Ferrari	Italy	5.00%
ALDAR Properties	UAE	4.20%

Developments and Projects

Name	Location	Holding
Cleveland Clinic Abu Dhabi	UAE	100.00%
MGM Grand Abu Dhabi	UAE	100.00%
UAE University Project Power Plant	UAE	100.00%
Dolphin Gas Project	Qatar	51.00%
Hadjret En-Nous Independent Power Project	Algeria	25.50%
Mukhaiznah Oil Field Project	Oman	15.00%
Oil Exploration Project	Oman	15.00%
Oil Exploration Project	Libya	10.00%
Abu Dhabi Financial Center Project	UAE	-
Integrated International City	Malaysia	-
Mubadala Capital Land Real Estate Company	UAE	-
Sangaredi Refinery Project	Guinea	-
Sowwah Square [in Sowwah Island]	UAE	-

Firm Name	**Abu Dhabi Future Energy Company**
Country	Abu Dhabi
Principal Activities	Develop and execute Masdar City by providing solutions for energy security
Date Established	2006
No of Employees	112
Exchange	Government Joint Stock
Symbol	n.a.
Chairman	Dr. B666
Financing	Mubadala Development Company
Total Value Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Masdar - Hydrogen Power Plant	UAE	60.00%
Torresol Energy	Spain	40.00%

Divisions

Name	Location	Holding
Masdar Institute of Science and Technology	UAE	100.00%
Masdar Research Network	UAE	100.00%
Innovation & Investment (I&I) Unit	-	-
Carbon Management Unit	-	-
Special Free Zone (SFZ) Unit	-	-

Developments and Projects

Name	Location	Holding
Masdar - Zero Carbon City	UAE	-

Firm Name	**Reem Investments**
Country	Abu Dhabi
Principal Activities	Private equity financial services company with interests in real estate and
Date Established	2005 (May)
No of Employees	28 (Head Office)
Exchange	Private Joint Stock
Symbol	n.a.
Chariman	HH Sheikh Tahnoon Bin Zayed Al Nahyan
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Reem Developers	UAE	100.00%
Reem Energy	UAE	100.00%
Reem Morocco	Morocco	100.00%
Aseel Finance	UAE	20.00%
Inshaa Properties	UAE	20.00%
AL Maabar International Company	-	-

Developments and Projects

Name	Location	Holding
Atlas Garden	Morocco	100.00%
Najmat Abu Dhabi [in Al Reem Island]	UAE	100.00%
Ourika Morocco	Morocco	100.00%
Rawdhat Abu Dhabi [in Al Reem Island]	UAE	100.00%

Firm Name	**Sorouh Real Estate Company**
Country	Abu Dhabi
Principal Activities	Real estate development
Date Established	2005 (June)
No of Employees	200
Exchange	Abu Dhabi SE
Symbol	SOROUH
Chairman	Saeed Eid Al Ghafli
Financing	Sorouh listed its shares on the Abu Dhabi Securities Exchange in December 2005 and raised USD374 million for 55% of the company's equity.
Total Projects in Development	24.6B

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Pivot Engineering and General Contracting Company	UAE	60.00%
Goodman Sorouh	UAE	50.00%
Aseel Finance	UAE	20.00%
Inshaa Properties	UAE	20.00%
Al Maabar International Company	UAE	-
Bait Al Khidmah	UAE	-
S and T Cool District Cooling Company	UAE	-
Sorouh International	UAE	-
Reem Finance	UAE	-

Developments and Projects

Name	Location	Holding
Khalidiya Residential Village	UAE	100.00%
Oyoun Village	UAE	100.00%
Sas Al Nakhl Phase 1	UAE	100.00%
Sas Al Nakhl Phase 2	UAE	95.00%
Shams Abu Dhabi	UAE	22.00%
Golf Gardens	UAE	12.50%
Sky Tower	UAE	10.50%
The Gate District	UAE	10.00%

Abu Dhabi Aviation Residential Complex	UAE	8.00%
Tala Tower	UAE	2.00%
Abu Dhabi Towers	UAE	-
Al Ghadeer	UAE	-
Al Mashtal	UAE	-
Al Shamkha	UAE	-
Bab Al Bahr	Morocco	-
Mangrove Place [in Al Reem Island]	UAE	-
Movenpick Resort and Spa Al Ain	UAE	-
Nagfa Hotel and Mall	UAE	-
RealMaroc	Morocco	-
Saraya Abu Dhabi	UAE	-
Sister Tower	UAE	-
Sun Tower	UAE	-
Tameer Towers	UAE	-

Firm Name	**Tamouh Investments**
a.k.a.	Tamouh
Country	Abu Dhabi
Principal Activities	Real estate investment and development.
Date Established	2004
No of Employees	5,000 (100 Compar
Exchange	Private LLC
Symbol	n.a.
Chariman	Mubarak Matar Al Humairi
Financing	n.a.
Total Projects in Development	n.a.

Name	Location	Holding
Al Reem Island	UAE	60.00%
City of Lights [in Al Reem Island] UAE -	UAE	-
Danet Gateway [in Danet Abu Dhabi Development]	UAE	-
Fantasy Island [in Al Reem Island]	UAE	-
Jebel Hafeet Glacier project	UAE	-
Marina Square [in Al Reem Island]	UAE	-
Meena Hotel and Towers	UAE	-
Meena Plaza	UAE	-
Movenpick Hotel Al Reem [in Al Reem Island]	UAE	-
Pearl of the Emirates [in Al Reem Island]	UAE	-
Royal Group Headquarters	UAE	-
Uni Cyber City [in Abu Dhabi International Airport]	UAE	-

Firm Name	**DAMAC Properties**
Country	Dubai
Principal Activities	Real estate investment and development; mortgage advisory services.
Date Established	1995
No of Employees	7,000 (1,171 UAE, 7,000 Worldwide)
Exchange	Private LLC
Symbol	n.a.
Chariman	Hussein Ali Habib Sajwani
Financing	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Marina Terrace	UAE	100.00%
DAMAC Mortgage Advisory	UAE	-
The Waves	UAE	-

Developments and Projects

Name	Location	Holding
Executive Heights	UAE	100.00%
Lago Vista 1 and 2 [in International Media Production Zone]	UAE	100.00%
Lake Terrace [in Jumeirah Group Lakes Towers]	UAE	100.00%
Lake View [in Jumeirah Group Lakes Towers]	UAE	100.00%
Ocean Heights [in Dubai Marina]	UAE	100.00%
Palm Springs	UAE	100.00%
Palm Terrace	UAE	100.00%
Park Towers	UAE	100.00%
Terra Del Sol 1 and 2	UAE	100.00%
The Crescent	UAE	100.00%
Al Jawharah	Saudi Arabia	-
Amber Residence [in Dubai Residential City]	UAE	-
Burjside Boulevard	UAE	-
Business Central	UAE	-
Business Central	Jordan	-
Business Gate	Jordan	-
Business Gate	UAE	-
Business Heights	UAE	-
Business Heights	Jordan	-
Business Tower	UAE	-
Capital Bay [in Business Bay]	UAE	-
Central Avenue	UAE	-
Central Avenue	Jordan	-
DAMAC Agents Academy	UAE	-
DAMAC Heights [in Dubai Marina]	UAE	-
Emirates Gardens 1 and 2	UAE	-
Executive Bay [in Business Bay]	UAE	-
Flamingo Heights	UAE	-
Gamsha Bay	UAE	-
Garden Heights	Egypt	-
Haz Tower	UAE	-
Hyde Park	Egypt	-
La Residence 1 and 2 at the Lotus	UAE	-
La Residence by Ivana Trump	Lebanon	-
Lakeside [in International Media Production Zone]	UAE	-
Lincoln Park	UAE	-
Lotus Heights	UAE	-
Madisson Residence	UAE	-
Marina Bay	UAE	-
Marina Terrace	UAE	-
Oceanscape Residences	UAE	-
Park Avenue [in New Cairo]	Egypt	-
Park Central	UAE	-
Puteri Harbour	Malaysia	-
Signature Residences	UAE	-
Smart Heights	UAE	-
Suburbia [in Downtown Jebel Ali]	UAE	-
Tarin Hills	Iraq	-
The Corner [in Business Bay]	UAE	-
The Courtyard	Jordan	-
The Cyclades	UAE	-
The Heights	Jordan	-
The Lofts [in The Heights]	Jordan	-
The Piazza	Qatar	-
The Terrace at Fox Hills	Qatar	-
The Wildflower Villas [in Jumeirah Golf Estates]	UAE	-
Tuscan 2	UAE	-
Tuscan Residences	UAE	-
Water's Edge [in Business Bay]	UAE	-
Westside [in Lincoln Park]	UAE	-
XL Tower	UAE	-

Firm Name	**Dubai City of Aviation Corporation**
Country	Dubai
a.k.a.	Dubai World City
Principal Activities	Urban aviation community and an integrated logistics development that
Date Established	2005
No of Employees	100
Exchange	government owned
Symbol	n.a.
Chairman	HH Sheikh Ahmad Bin Saeed Al Maktoum
Financing	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Dubai World Central DuServe	UAE	100.00%
Dubai World Central Global Technologies	UAE	100.00%
Dubai World Central Logistics City	UAE	100.00%
Istithmar World Aviation Holdings	UAE	-

Developments and Projects

Name	Location	Holding
Al Maktoum International Airport	UAE	100.00%
Dubai World Central Aviation City	UAE	100.00%
Dubai World Central Commercial City	UAE	100.00%
Dubai World Central Golf City	UAE	100.00%
Dubai World Central Residential City	UAE	100.00%

Firm Name	**Dubai Holding**
a.k.a.	DH
Country	Dubai
Principal Activities	Healthcare, technology, real estate, financial services, education,
Date Established	2004 (October)
No of Employees	16000 (Group)
Exchange	Private LLC
Symbol	n.a.
Chariman	Mohammed Bin Abdullah Al Gergawi
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Dubai Group	UAE	100.00%
Dubai International Capital	UAE	100.00%
Dubai Holding Commercial Operations Group	UAE	99.67%

Investments

Name	Location	Holding
Al Salam Bank	Bahrain	-
Dubai Real Estate Institute	UAE	-
Manazel Real Estate	UAE	-

Firm Name	**Dubai Holding Commercial Operations**
a.k.a.	DHCOG, DHC Group
Country	Dubai
Principal Activities	Holding company with interests in hospitality, leisure, real estate, technology,
Date Established	2006 (October)
No of Employees	14000 (Group)
Exchange	Private LLC
Symbol	n.a.
Chariman	Fadel A Al Ali
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Dubai Properties Group	UAE	100.00%
Jumeirah Group	UAE	100.00%
Sama Dubai	UAE	100.00%
TECOM Investments	UAE	100.00%
Tatweer	UAE	100.00%

Firm Name	**Dubai Properties**
a.k.a.	DPG
Country	Dubai
Principal Activities	Real estate development and leasing; construction of shopping malls, hotels
Date Established	2002
No of Employees	1500
Exchange	Private LLC
Symbol	n.a.
Executive Chariman	Hashim Abdullah Al Dabal
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Dubai Asset Management Company	UAE	100.00%
The Walk	UAE	100.00%
Arady Developments Company	UAE	50.00%
Dubai Hospitality	UAE	-
Dubai Retail	UAE	-
INJAZ	UAE	-
Salwan Property Management	UAE	-
Simsari	UAE	-

Developments and Projects

Name	Location	Holding
Al Waha Villas [in Dubailand]	UAE	100.00%
Aspect Tower	UAE	-
Bay Avenue [in Business Bay]	UAE	-
Bay Square	UAE	-
Business Bay	UAE	-
Culture Village	UAE	-
Jumeirah Beach Residence [JBR]	UAE	-
Mazad	UAE	-
Mudon [in Dubailand]	UAE	-
Porsche Design Towers	UAE	-
Signature Towers	UAE	-
The Executive Towers	UAE	-
The Villa	UAE	-
Tijara Town	UAE	-
Vision Tower [in Business Bay]	UAE	-

Firm Name	**Jumeirah Group**
a.k.a.	Jumeirah
Country	Dubai
Principal Activities	Provide hotel, resorts and real estate development and management.
Date Established	1997
No of Employees	11000
Exchange	Private LLC
Symbol	n.a.
Executive Chariman	Gerald Lawless
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Burj Al Arab	UAE	100.00%
Emirates Academy of Hospitality Management	UAE	100.00%
Jumeirah Emirates Towers	UAE	100.00%
Jumeirah International	UAE	100.00%
Madinat Jumeirah	UAE	-
Wild Wadi Water Park	UAE	-

Developments and Projects

Name	Location	Holding
Jumeirah Al Fattan Palm Resort	UAE	-
Jumeirah Business Bay Hotel	UAE	-
Jumeirah Creekside Park Hotel	UAE	-
Jumeirah Desert Pearl Hotel Aqua Dunya	UAE	-
Jumeirah Dubai Towers	Doha Qatar	-
Jumeirah HanTang	Xintiandi China	-
Jumeirah Hotel at Beetham Tower	UK	-
Jumeirah Private Island Phuket Resort	Thailand	-
Jumeirah Southland Resort	Bermuda	-
Saraya Aqaba	Jordan	-

Firm Name	**Sama Dubai**
Country	Dubai
Principal Activities	Real estate investment and development.
Date Established	2004 (October)
No of Employees	515
Exchange	Private LLC
Symbol	n.a.
Executive Chariman	Farhan Faraidooni
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Sama Contracting	UAE	-
Sama Dubai - Oman	Oman	-
Sama Dubai - Qatar	Qatar	-
Sama ECH	UAE	-
SmartCity	UAE	-

Developments and Projects

Name	Location	Holding
Dubai Towers - Doha	Qatar	100.00%
The Lagoons	UAE	100.00%
Amwaj	Morocco	-
Chrifia Oasis Resort	Morocco	-
Dubai Towers - Dubai	UAE	-
Dubai Towers - Istanbul	Turkey	-
Marina de Casablanca	Morocco	-
Mediterranean Gate	Tunisia	-
Salam - Yiti	Oman	-
Salam Resort - Shinas	Oman	-
Salam Resort Bahrain	Bahrain	-
Smart City Kochi [via SmartCity]	India	-
Smart City Malta [via SmartCity]	Malta	-
The Creekfront Development	UAE	-

Firm Name	**TECOM Investments**
a.k.a.	TECOM
Country	Dubai
Principal Activities	Establish, own and operate free trade zones, educational institutions and
Date Established	2000
No of Employees	250 (Company)
Exchange	Private LLC
Symbol	n.a.
Chariman	Ahmad Bin Byat
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Consortium Dubai	UAE	100.00%
Dubai Biotechnology and Research Park	UAE	100.00%
Dubai International Academic City [DIAC]	UAE	100.00%
Dubai Internet City	UAE	100.00%
Dubai Knowledge Village	UAE	100.00%
Dubai Media City	UAE	100.00%
Dubai Outsource Zone	UAE	100.00%
Dubai Studio City	UAE	100.00%
Emirates Communications and Technology Company [ECTC]	UAE	100.00%
International Media Production Zone [IMPZ]	UAE	100.00%
TECOM International	UAE	100.00%
eHosting DataFort [EHDF]	UAE	100.00%
Maltacom [via Emirates International Telecommunications]	Malta	60.00%
Emirates Central Cooling Systems Corporation	UAE	50.00%
Axiom Telecom	UAE	40.00%
Société Nationale des Télécommunications [via Emirates International Telecommunications]	Tunisia	35.00%
Interoute Telecom Holding [via TECOM Investments Overseas]	United Kingdom	30.00%
Forthnet [via Emirates International Telecommunications]	Greece	21.00%
Emirates Integrated Telecommunications Company [via Emirates Communications and Technology Company]	UAE	20.00%
Emirates International Telecommunications [EIT]	Malta	-
Energy and Environment Park [Enpark]	UAE	-
Smart City	UAE	-
TECOM Investments Overseas	Cayman Islands	-

Developments and Projects

Name	Location	Holding
Mixed-use Development [in International Media Production Zone and TECOM Site A	UAE	-
Smart City Kochi [via Smart City]	India	-
Smart City Malta [via Smart City]	Malta	-
Smart Heights Project UAE	UAE	-

Firm Name	**Tatweer**
Country	Dubai
Principal Activities	Management and development of a portfolio of Dubai Holding companies
Date Established	2005 (December)
No of Employees	400 (Company)
Exchange	Private LLC
Symbol	n.a.
Chariman	Saeed Hussein Al Muntafek
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Arab Media Group	UAE	100.00%
Bawadi	UAE	100.00%
Dubai Energy	UAE	100.00%

Dubai Healthcare City	UAE	100.00%
Dubai Industrial City	UAE	100.00%
Dubailand UAE	UAE	100.00%
Global Village	UAE	100.00%
Mizin	UAE	100.00%
The Tiger Woods Dubai	UAE	100.00%
Moutamarat	UAE	51.00%
Dubai Mercantile Exchange	UAE	32.50%
Lammtara Pictures	UAE	30.00%
Harvard Medical School	UAE	-
Six Flags Dubailand	UAE	-
Universal City Dubailand	UAE	-

Firm Name	**Dubai World**
Country	Dubai
Principal Activities	Invests in real estate, financial services, healthcare, education, tourism and
Date Established	2006 (March)
No of Employees	50,000 (Group)
Exchange	Government Joint Stock
Symbol	n.a.
Chariman	Sultan Ahmad Bin Sulayem
Financing	n.a.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Dubai Auto Zone [via Economic Zones World]	UAE	100.00%
Dubai Cars and Automotive Zone	UAE	100.00%
Dubai Maritime City	UAE	100.00%
Dubai Textile City	UAE	100.00%
Dubai World Africa	South Africa	100.00%
Economic Zones World [EZW]	UAE	100.00%
FORSA Investment Company	UAE	100.00%
Istithmar World	UAE	100.00%
Jumeirah Golf Estates [via Leisurcorp]	UAE	100.00%
Leisurecorp	UAE	100.00%
Limitless	UAE	100.00%
Nakheel	UAE	100.00%
Pearl Valley Golf Estates [via Leisurecorp]	South Africa	100.00%
Port and Free Zone World	UAE	100.00%
Tejari	UAE	100.00%
Thunder	UAE	100.00%
Pan-United Marine Limited [via Dubai Drydocks]	Singapore	84.82%
DP World [via Port and Free Zone World]	UAE	77.00%
Drydocks World	UAE	-
Dubai Real Estate Institute	UAE	-
Dubai World Comoros [via Dubai World Africa]	Comoros	-
Gazeley [via Economic Zones World]	United Kingdom	-
Imdaad	UAE	-
Nakheel Retail	UAE	-
Nest Lodge [via Dubai World Africa]	Rwanda	-
V and A Waterfront [via Dubai World Africa]	South Africa	-

Developments and Projects

Name	Location	Holding
Jock Safari Lodge [via Dubai World Africa]	South Africa	100.00%
Sanbona Wildlife Reserve [via Dubai World Africa]	South Africa	100.00%
Shamwari Game Reserve [via Dubai World Africa]	South Africa	100.00%
Bilene Hotel	Mozambique	-
Djibouti Automobiles and Heavy Equipment Zone [via Dubai World Africa]	Djibouti	-

Firm Name	**Limitless**
Country	Dubai
Principal Activities	Real estate development and management.
Date Established	2005 (July)
No of Employees	300 (270 Company, 300 Group)
Exchange	Government LLC
Symbol	n.a.
Chariman	Sultan Ahmad Bin Sulayem
Financing	Initial equity capital from Dubai World
Total Projects in Development	$100 billion

Subsidiaries/Associates/Affiliates

Name	Location	Holding
PT Bakrie Swasakti Utama	Indonesia	30.00%
Limitless Consultancy Company	China	-
Limitless Jordan	Jordan	-
Limitless Real Estate China	China	-
Limitless World China	Hong Kong	-

Developments and Projects

Name	Location	Holding
Malaysia International Halal Park [MIHAP]	Malaysia	80.00%
Al Wasl	Saudi Arabia	-
Arabian Canal	UAE	-
Bidadi	India	-
Downtown Jebel Ali	UAE	-
Halong Star	Vietnam	-
International City	UAE	-
Jumeirah Group Village South	UAE	-
Limitless Towers	Jordan	-
Quattro Hotel and Business Park	UAE	-
Residential North Puteri Harbour	Malaysia	-

Firm Name	**Nakheel**
Country	Dubai
Principal Activities	Real estate investment, development and brokerage services; design and
Date Established	2001 (Febraury)
No of Employees	2,500 (Company)
Exchange	Government LLC
Symbol	n.a.
Chairman	HE Sultan Ahmad Bin Sulayem
Financing	Dubai World
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Jumeirah Horizons	UAE	100.00%
Nakheel Hotels	UAE	100.00%
Nakheel Marinas	UAE	100.00%
Nakheel Travel	UAE	100.00%
Palm Monorail Company	UAE	100.00%
Ibn Battuta Mall	UAE	99.00%
Nakheel International Realty	UAE	99.00%
The Gardens	UAE	99.00%
The Dubai Waterfront Company	UAE	51.00%
Nakheel Saudi Arabia	Saudi Arabia	50.00%
Spice Jet	India	25.00%
Community Corp	UAE	-
International City Company	UAE	-
Nakheel Asset Management	UAE	-

Nakheel Aviation	UAE	-
Nakheel Design Group	UAE	-
Nakheel Developments	UAE	-
Nakheel Golf	UAE	-
Nakheel International	UAE	-
Nakheel Investment Projects	UAE	-
Nakheel Occupational Health and Safety	UAE	-
Nakheel Retail	UAE	-
Property Corp	UAE	-
Simsari	UAE	-
Tashyed	UAE	-
IFA Hotels and Resorts	Kuwait	-
Island Global Yachting	United States	-
The Trump Organization	United States	-

Developments and Projects

Name	Location	Holding
Discovery Gardens	UAE	100.00%
Dragon Mart Complex	UAE	100.00%
Dubai Design Center	UAE	100.00%
International City	UAE	100.00%
Jumeirah Islands	UAE	100.00%
Jumeirah Village	UAE	100.00%
Palm Gateway Towers	UAE	100.00%
The Lost City	UAE	100.00%
The Palm Deira	UAE	100.00%
The Palm Jebel Ali	UAE	100.00%
The Palm Jumeirah	UAE	100.00%
The Trump Marina Residences	UAE	100.00%
The World	UAE	100.00%
The Trump Plaza	UAE	99.00%
Dubai Waterfront	UAE	51.00%
Madinat Al Arab	UAE	51.00%
Al Furjan	UAE	-
Al Warsan City	UAE	-
Anchor Marina	UAE	-
Arabian Canal	UAE	-
Atlantis [on The Palm Jumeirah]	UAE	-
Burj Nakheel	UAE	-
Coral Island [in The World]	UAE	-
Deira Island	UAE	-
Dubai Promenade	UAE	-
Emirates Precinct [in International City]	UAE	-
Hotel Emerald Palace Dubai [on The Palm Jumeirah]	UAE	-
Jebel Ali Village Redevelopment	Morocco	-
Jumeirah Golf Estates	UAE	-
Jumeirah Heights	UAE	-
Jumeirah Lakes Towers	UAE	-
Jumeirah Park	UAE	-
Kempenski Jumeirah Residence [on The Palm Jumeir	UAE	-
Lost City Developments	UAE	-
Marina Residences [on The Palm Jumeirah]	UAE	-
Omran	UAE	-
Shoreline Apartments Clubhouse	UAE	-
Sugar Land City	Pakistan	-
TAJ Exotica Resort and Spa [in The Grandeau Reside	UAE	-
The Fairmont Palm Residences [on The Palm Jumeira	UAE	-
The Grand Fort Dubai [in Jebel Ali]	UAE	-
The Moevenpick Resort Oceana Palm Jumeirah	UAE	-
The Palm Golden Mile [on The Palm Jumeirah]	UAE	-

The Palm Monorail	UAE	-
The Universe	UAE	-
Trump International Hotel and Tower [in Palm Jumeira	UAE	-
Veneto [in Dubai Waterfront]	UAE	-
Waterfront City	UAE	-
Waterfront Palm Canal Towers	UAE	-
Worlds of Discovery [in The Palm Jebel Ali]	UAE	-

Firm Name	**Emaar Properties**
a.k.a.	Emaar Group
Country	Dubai
Principal Activities	Real estate investment, development and property management; general contracting; commercial banking and mortgage finance; health care; education; leisure; retail; hospitality and provision of information technology and data communication services.
Date Established	1997 (June)
No of Employees	5,000 (700 Company, 5,000 Group)
Exchange	Dubai FM
Symbol	EMAAR
Chairman	HE Sheikh Mohammed Bin Ali Rashid Al Abbar
Financing	Emaar Properties was established in 1997 as a public joint stock company and listed in March 2000 on the Dubai Financial Market. In June 2005, Emaar doubled its share capital through a rights issue making it the world's largest listed property developer with a market capitalization of AED92 billion (USD25 billion). Foreign ownership of the stock was also raised from 20% to 49%. Emaar announced, in November 2007, its plan for a USD40 billion share listing on the London Stock Exchange.
Total Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Arabian Ranches	UAE	100.00%
Emaar Dubai	UAE	100.00%
Emaar Education	UAE	100.00%
Emaar Healthcare Group	UAE	100.00%
Emaar Hospitality Group	UAE	100.00%
Emaar Hotels and Resorts	UAE	100.00%
Emaar International	UAE	100.00%
Emaar International Jordan	Jordan	100.00%
Emaar Investment Holding	UAE	100.00%
Emaar Malls Group	UAE	100.00%
Emaar Misr for Development Company	Egypt	100.00%
Emaar Morocco Offshore	Morocco	100.00%
Emaar Syria	Syria	100.00%
Emaar Towers	UAE	100.00%
Emirates Living	UAE	100.00%
Hamptons International Holding	United Kingdom	100.00%
WL Homes [John Laing Homes]	United States	100.00%
Emaar Algeria	Algeria	75.00%
Emaar Libya	Libya	75.00%
Emaar Tunisa	Tunisia	75.00%
Emaar Turkey	Turkey	75.00%
Emaar APIC	India	74.00%
Al Shamiyah for Real Estate Development Company	Saudi Arabia	70.00%
Emaar Pakistan	Pakistan	67.00%
Emaar Lebanon	Lebanon	65.00%
Emaar Middle East	Saudi Arabia	61.00%
Emaar GIGA Karachi	Pakistan	60.00%
Emaar IGO	Syria	60.00%
Emaar Properties - Canada	Canada	60.00%
Emaar Properties Gayrimenkul Gelistirme Anonim Sirk	Turkey	60.00%
Emaar Cham	Syria	50.00%
Prestige Resorts	Morocco	50.00%
Turner International Middle East	UAE	50.00%
Amlak Finance	UAE	48.00%
Emaar DHA Islamabad [via Emaar Pakistan]	Pakistan	47.00%
Emaar MGF Land	India	42.00%
Emaar Industries and Investments	UAE	40.00%
Emaar Financial Services	UAE	37.50%

Emrill Services	UAE	33.33%
Emaar the Economic City	Saudi Arabia	32.00%
Dubai Bank	UAE	30.00%
Dubai Banking Group	UAE	30.00%
Azem Properties	Azerbaidjan	20.00%
Al Sahab [in Dubai Marina]	UAE	-
Budget Hotels India [via Emaar MGF Land]	India	-
Capital Partners	UAE	-
Dubai Real Estate Institute	UAE	-
Emaar Bawadi	UAE	-
Emaar District Cooling	UAE	-
Emaar Golf Homes	UAE	-
Emaar Indonesia	Indonesia	-
Emaar Palestine	Palestinian Territori	-
Emaar Property Management Academy	UAE	-
Emaar Saudi Arabia	Saudi Arabia	-
Emaar Utilities	UAE	-
Emmar Properties - Jordan	Jordan	-
Leighton Construction India [via Emaar MGF Land]	India	-
Majara [in Dubai Marina]	UAE	-
Sahm Technologies	UAE	-
The Views [in Emirates Golf Club]	UAE	-

Developments and Projects

Name	Location	Holding
Boulder Hills [via Emaar MGF Land]	India	100.00%
Burj Dubai [in Downtown Burj Dubai]	UAE	100.00%
Emirates Hills	UAE	100.00%
Gold Souk Complex	UAE	100.00%
L'Ussailly	UAE	100.00%
Oukaimeden [via Emaar Morocco Offshore]	Morocco	100.00%
Saphira [via Emaar Morocco Offshore]	Morocco	100.00%
Tinja [via Emaar Morocco Offshore]	Morocco	100.00%
Diamond Bar Island City [via Emaar Pakistan]	Pakistan	85.00%
Mixed Use Developent - Karachi [via Emaar Pakistan]	Pakistan	67.00%
Master Planned Communities - Islamabad [via Emaar	Pakistan	66.60%
Al Khobbar Lakes [via Emaar Saudi Arabia]	Saudi Arabia	61.00%
Eighth Gate Project [via Emmar Syria]	Syria	60.00%
Amelkis II [via Emaar Morocco Offshore]	Morocco	50.00%
Amelkis III [via Emaar Morocco Offshore]	Morocco	50.00%
Asmaran [in Dubailand]	UAE	50.00%
Bahia Bay [via Emaar Morocco Offshore]	Morocco	50.00%
Hyderabad Convention Center [via Emaar Emaar MGF	India	50.00%
Armani Residences	UAE	-
Bawadi Mixed Use Development [in Dubailand]	UAE	-
Burj Dubai Boulevard	UAE	-
Burj Park III [in Downtown Burj Dubai]	UAE	-
Canyon Views [via Emaar Pakistan]	Pakistan	-
Centro Towers [in Burj Dubai]	UAE	-
Claren 2 [in Claren District]	UAE	-
Crescent Bay [via Emaar Pakistan]	Pakistan	-
Downtown Burj Dubai	UAE	-
Dubai Marina Towers [in Dubai Marina]	UAE	-
Esplanade at Chennai [via Emaar MGF Land]	India	-
Ghadeer Townhouses [in The Lakes]	UAE	-
Grand Boulevard [in Burj Dubai Boulevard]	UAE	-
Healthcare City [via Emaar Algeria]	Algeria	-
Lombok	Indonesia	-
M Burj Dubai [in Downtown Burj Dubai]	UAE	-
Marina Al Qussor [via Emaar Tunisia]	Tunisia	-

Marina Plaza	UAE	-
Marina Promenade	UAE	-
Maysan Towers	UAE	-
New Bali [via Emaar Indonesia]	Indonesia	-
New City of Sidi Abdullah [via Emaar Algeria]	Algeria	-
Novotel Hyderabad [via Emaar MGF Land]	India	-
Palm Drive at Gurgaon [via Emaar MGF Land]	India	-
Polo Homes [in Arabian Ranches]	UAE	-
The Dubai Mall Hotel and Serviced Apartments [in Dou	UAE	-
The Highlands [via Emaar Pakistan]	Pakistan	-
The Lakeside [via Emaar Turkey]	Turkey	-
The Loft Towers	UAE	-
The Mansion at Burj Dubai [in Burj Dubai Boulevard]	UAE	-
The Old Town Island	UAE	-
The Palm Springs at Gurgoan [via Emaar MGF Land]	India	-
The Views at Mohali [via Emaar MGF Land]	India	-
Tuscan Valley Houses [via Emaar Turkey]	Turkey	-
Warsan Complex Project	UAE	-
Zowara Abu Kemash Project [via Emaar Libya]	Libya	-

Firm Name	**Tameer Holding**
a.k.a.	Tameer, Tameer Holding Investments, Tameer Property
Country	Dubai
Principal Activities	Real estate development
Date Established	1991
No of Employees	350
Exchange	Private LLC
Symbol	n.a.
CEO	Abdullah Al Haj Ali
Financing	n.a.
Total Projects in Development	n.a.

Affililates

Name	Location	Holding
Ayesh Enterprises	United States	100.00%
Emirates Modern Industrial	UAE	100.00%
Tameer Real Estate International Company	Jordan	-
Tatweer Real Estate Developments [via Tameer Real Estate International Company]	Jordan	-

Developments and Projects

Name	Location	Holding
Al Salam City	UAE	100.00%
Al Shahd Tower [in Emirates Hills]	UAE	100.00%
Princess Tower [in Dubai Marina]	UAE	100.00%
The Palace Towers [in Dubai Silicon Oasis]	UAE	100.00%
The Regal Tower 1 [in Business Bay]	UAE	100.00%
Abu Dhabi Towers [in Shams Abu Dhabi]	UAE	-
Ajmakan [in Al Khuzama Quarter]	Saudi Arabia	-
Al Ameera Village	UAE	-
Al Ferdous [in Al Salam City]	UAE	-
Al Hanaa City	Libya	-
Al Majd City	Jordan	-
Al Naseem Residential District	UAE	-
Crystal City	Jordan	-
Diplomatic Villas	Jordan	-
Elite Residence [in Dubai Marina]	UAE	-
Imperial Residence [in Jumeirah Village]	UAE	-
Index Building	Jordan	-
Orbit Tower	UAE	-
Platinum Towers [in Business Bay]	UAE	-

Prestige Heights	UAE	-
Shams Abu Dhabi [in Gate District]	UAE	-
Silver Tower [in Business Bay]	UAE	-
Smart Homes Development	Libya	-
Tameer Towers [in Reem Island]	UAE	-
The Gate Towers [in Reem Island]	UAE	-
Umm Al Quwain city	UAE	-
Wadi Al Sharqi	Libya	-

Firm Name	**Saraya Holdings**
Country	Jordan
Principal Activities	Holding company involved in real estate investment, development and
Date Established	2005
No of Employees	210
Exchange	Private LLC
Symbol	n.a.
Chairman	Saadeddine Rafik Al Hariri
Financing	
Total Value Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Saraya Jordan	Jordan	100.00%
Millenium Development International Company	Lebanon	-
Saraya Aviation	Jordan	-
Saraya Development Group	UAE	-
Saraya Ras Al Khaimah	UAE	-
Saraya Realty	Jordan	-
Saraya Services	Jordan	-

Developments and Projects

Name	Location	Holding
Saraya Aktau	Kazakhstan	-
Saraya Bandar Jissah	Oman	-
Saraya Islands [via Saraya Ras Al Khaimah]	UAE	-
Saraya Oman	Oman	-
Saraya Sochi	Russia	-

Firm Name	**Solidiere**
Country	Lebanon
Principal Activities	Solidere was incorporated in 1994 by government decree with the sole
Date Established	1994 (may)
No of Employees	370
Exchange	Beruit
Symbol	
Chairman	Nasser Al Chammaa
Financing	While a commercial company listed on the Beirut Stock Exchange, Solidere
Total Value Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Solidaire Egypt	Egypt	100.00%
Solidere International Holdings	Lebanon	99.99%
Solidere International	UAE	37.20%
Beirut Real Estate Managment and Services	Lebanon	-
Solidere International Hotels and Resorts	UAE	-

Developments and Projects

Name	Location	Holding
Al Zorah [via Solidere International]	UAE	50.00%
Al Dahira Project [via Solidere International]	Saudi Arabia	-
Beirut Gate	Lebanon	-

Beirut Trade Center	Lebanon	-
East Town	Egypt	-
Saifi II	Lebanon	-
Serail Hill	Lebanon	-
The Souks of Beirut	Lebanon	-
Wadi Abou Jamil	Lebanon	-
West Town	Egypt	-
Yachting Club [in Beirut Marina]	Lebanon	-
Zokak El Blatt	Lebanon	-

Firm Name	**Qatari Diar**
Country	Qatar UAE
Principal Activities	Real estate investment and development; feasibility studies; property and facilities management.
Date Established	2004
No of Employees	300
Exchange	Government Owned
Symbol	n.a.
Chairman	HE Sheikh Hamad Bin Jabr Bin Jassem Al Thani
Financing	
Total Value Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Al Qutaifiya Lagoon	Qatar	100.00%
Qatar Real Estate Partners	Qatar	51.00%
Barwa Real Estate Company	Qatar	45.00%
Al Houara Tangier Resort	United Kingdom	-
Bayti Real Estate Investment Company	Palestinian Ter.	-
Diar Infrastructure Services Company [Diar Infra]	Qatar	-
Libyan Qatari Real Estate and Tourism Company	Libya	-
Multi Utility Company	Qatar	-
Project Blue Guernsey	United Kingdom	-
Qatari Diar Visitors Center	Qatar	-

Developments and Projects

Name	Country	Holding
Lusail	Qatar	100.00%
Communications City	Qatar	25.00%
Al Difaf Khartoum project	Sudan	-
Al Houara Resort	Morocco	-
Al Rayyan Hills	Yemen	-
Barwa Interim Doha Convention Center and Tower	Qatar	-
Blue Nile Development	Sudan	-
Cayo Largo Resort	Cuba	-
Chelsea Barracks	United Kingdom	-
Chiva Som Qatar [in Ras Qutaifaan]	Qatar	-
Diar Damascus Resort	Syria	-
Hurghada Tourism City	Egypt	-
Ibn Hani Bay Resort	Syria	-
Jebel Al Kaaba Hotel Development	Saudi Arabia	-
Nile Corniche	Egypt	-
Ras Al Hadd	Oman	-
Rawabi [via Bayti Real Estate Investment Company]	Palestinian Territori	-
Seychelles mixed-use development	Seychelles	-
Sharm Al Sheikh mixed-use development	Egypt	-
Sultana Malak Hotel	Egypt	-

Firm Name	**Tamniyat Investment Group**
a.k.a.	Tamniyat Group
Country	Saudi Arabia
Principal Activities	real estate development and management; investment in real estate
Date Established	1982
No of Employees	350
Exchange	Private
Symbol	n.a.
Chairman	Khaled Bin Naser Al Shatry
Financing	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Osus	UAE	30.00%
Business Bay	UAE	-
Tanmiyat Capital	Singapore	-
Tanmiyat Drug Store	Saudi Arabia	-
Tanmiyat Medical	Saudi Arabia	-
Tanmiyat Partners	UAE	-
Tanmiyat Project Management Company	Saudi Arabia	-
Tanmiyat Trading	Saudi Arabia	-

Developments and Projects

Name	Location	Holding
Ajman Marina	UAE	-
Al Khalidiyah	Saudi Arabia	-
Al Salam Project	Saudi Arabia	-
Commercial Heights [at Business Bay]	UAE	-
Eastern Industrial City	Saudi Arabia	-
Living Legends [at Dubailand]	UAE	-
Makkah International Market	Saudi Arabia	-
Marina Garden [at Dubai Marina]	UAE	-
Prince Sultan Residential and Commercial Blocks	Saudi Arabia	-
Tanmiyat 2050	Turkey	-
Umm Al Quwain Industrial Zone	UAE	-

Firm Name	**Al Hanoo Holding Company**
Country	Sharjah
Principal Activities	Real estate investment and development; building contractors; gas and
Date Established	1972
No of Employees	850
Exchange	
Symbol	n.a.
Chairman	Abdullah Bin Fahed Al Shakra
Financing	
Total Value Projects in Development	n.a.

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Al Hanoo Agricultural Company	Saudi Arabia	100.00%
Al Hanoo Contracting Establishment	Saudi Arabia	100.00%
Al Hanoo Utilities	Saudi Arabia	100.00%
Riyadh Development Co. for Real Estate Investment	Saudi Arabia	100.00%
Djibouti Holding	Djibouti	70.00%
Ewan	UAE	50.00%
Emirates Industrial City Company	UAE	41.00%
Al Hanoo Trading Company	Saudi Arabia	-
Al Riyadh Property Development and Investment Com	UAE	-
Gas and Electric Networks Installation	UAE	-
Nujoom Islands Company	UAE	-

Developments and Projects

Name	Location	Holding
Al Hanoo Properties	UAE	100.00%
Nujoom Islands [Star Islands]	UAE	100.00%
Special Economic Zone 1	Djibouti	70.00%
Special Economic Zone 2	Djibouti	70.00%
Special Economic Zone 3	Djibouti	70.00%
Emirates Industrial City	UAE	41.00%

Firm Name	**DLF**
a.k.a.	DLF Group
Country	India
Principal Activities	Core business is divided into three prime divisions: Homes, Offices and Shopping Malls. To these DLF has added three more divisions: Hotels, Infrastructure and special economic zones (SEZs).
Date Established	1946
No of Employees	n.a.
Exchange	National
Symbol	DLF
Chairman	Kushal Pal Singh
Financing	Privately held, with recent limited share IPO and delisting.
Total Projects in Development	224 million sq. ft. existing development and 748 million sq. ft. projects planned

Subsidiaries/Associates/Affiliates

Name	Location	Holding
DLF Laing O'ourke	United Kingdom	50.00%
Nakheel	UAE	50.00%
Limitless	UAE	50.00%
Amranresports Group	-	-
Hilton Hotels Corporation	-	74.00%
Four Seasons Hotels and Resorts	-	-

Developments and Projects

Name	Location	Holding
Retail		
DLF City Centre	Gugaon	-
Mega Mall	Gugaon	-
Grand Mall	Gugaon	-
City Centre	New Delhi	-
The Galleria	New Delhi	-
City Centre Chandigarh	Chandigharh	-
South Point	Gugaon	-
Star Mall	Gugaon	-
DLF Towers	New Delhi	-
The Promenade	New Delhi	-
The Emporio	New Delhi	-
The Courtyard	New Delhi	-
The South Court	New Delhi	-
DLF Towers	New Delhi	-
The Galleria	Punjab	-
Mall Of India	Gugaon	-
Town Square	Noida	-
DLF Towers	Hyderabad	-
The Galleria	Kolkata	-
The Grand Mall	Kolkata	-
The Galleria	Punjab	-
DLF Patto Plaza	Goa	-
DLF Savitri	New Delhi	-
DLF Andheri	Mumbai	-
DLF NTC Mills	Mumbai	-
DLF Worli	South Mumbai	-
DLF Hyderabad	Hyderabad	-
DLF Bangalore	Bhoruka	-
DLF Pune	Pune	-
DLF Chennai	Chennai	-
DLF Cochin	Cochin	-
DLF Amritsar	Amritsar	-

Residential		
Garden City	Chennai	-
Garden City	New Indore	-
New Town Heights	Gurgaon	-
New Town Heights	Kolkata	-
DLF Riverside	Kochi	-
DLF Park Place	Gurgaon	-
The Beliare	Gurgaon	-
The Aralias	Gurgaon	-
The Magnolias	Gurgaon	-
The Summit	Gurgaon	-
The Pinnacle	Gurgaon	-
The Icon	Gurgaon	-
The Royalton Tower	Gurgaon	-
Silver Oaks	Gurgaon	-
Beverly Park	Gurgaon	-
Regency Par II	Gurgaon	-
Hamilton Court	Gurgaon	-
Windsor Court	Gurgaon	-
Richmond Park	Gurgaon	-
Oakwood Estate	Gurgaon	-
Ridgewood Estate	Gurgaon	-
Wellington Estate	Gurgaon	-
Princeton Estate Carlton Estate	Gurgaon	-
Belvedere Park	Gurgaon	-
Belvedere Towers	Gurgaon	-
Trinity Tower	Gurgaon	-
West End Heights	Gurgaon	-
Leisure		
DLF Golf andCountry Club	Gugaon	-
DLF City Club	Gugaon	-
Special Economic Zone (SEZ)		
DLF Cyber SEZ Building 14	Gugaon	-
DLF Cyber SEZ Building 6	Gugaon	-
DLF IT SEZ	Silokhera	-
DLF Akruti IT SEZ	Pune	-
DLF IT SEZ	Chennai	-
DLF IT SEZ	Hyderabad	-
DLF IT Park	Kolkata	-
DLF IT Park	Nagpur	-
DLF IT Park	Noida	-
DLF IT Park	Chandigarh	-
DLF IT Park	Gandhinagar	-
DLF Cyber Terraces	Gugaon	-
DLF Cyber SEZ Building 10	Gugaon	-
DLF Cyber SEZ Building 9	Gugaon	-
Office & Build to Suit		
Nestle House		
Atria		
IBM Tower		
Ericcson Forum		
DLF Centre		
DLF Gateway Tower		
Building 8		
DLF Corporate Park		
DLF Cyber Greens		
DLF Infinity Tower		
DLF Plaza Tower		
DLF Centre Court		
DLF Square		

Firm Name	**Unitech Group**
Country	India
Principal Activities	Diverse developer of residential, commercial, retail, entertainment, hospitality projects and special enterprise zones (SEZs).
Date Established	1974
No of Employees	n.a.
Exchange	n.a.
Symbol	n.a.
Chairman	Ramesh (Sanjay) Chandra
Financing	US $15 billion market cap company with an external capital of under US $10 million.
Total Value Projects in Development	n.a.

Developments and Projects

Name	Location	Holding
Mixed Use		
Unitech Grande	Noida	-
Uniworld City	Noida	-
Residential		
Unitech Horizon	Noida	-
Unitech Cascades	Noida	-
Unitech Verve	Noida	-
Unitech Habitat	Noida	-
Uniworld City	Mohali	-
Fresco	Gurgaon	-
Karma Island	Gurgaon	-
Harmony	Gurgaon	-
Legacy	Lucknow	-
Heritage	Lucknow	-
South City	Lucknow	-
South City Gardens	Lucknow	-
Harmony	Kolkata	-
Sunbreeze Towers	Ghaziabad	-
West End Vivar	Bombay	-
Deja View Park	Bangalore	-
Parkway	Bangalore	-
Terrace Garden	Bangalore	-
Deja View	Bangalore	-
Windsor Court	Bangalore	-
Heritage Estate	Bangalore	-
Commercial		
InfoSpace 62	Noida	-
InfoSpace 135	Noida	-
InfoSpace	Noida	-
InfoSpace Dundahera	Gurgaon	-
InfoSpace Tikri	Gurgaon	-
Untech Business Park	Gurgaon	-
Unitech Cyber Park	Gurgaon	-
Global Business Park	Gurgaon	-
Signature Towers	Gurgaon	-
Unitech Trade Centre	Gurgaon	-
Millennium Plaza	Gurgaon	-
Infocentre	Gurgaon	-
InforSpace	Kolkata	-
Retail & Leisure		
World of Wonders	Noida	-
Great India Place	Noida	-
Gardens Galleria	Noida	-
Greenwood Center	Gurgaon	-
Gurgaon Central	Gurgaon	-
Gurgaon Mall	Gurgaon	-
Rohini Amusement Park	Delhi	-

Firm Name	**MARG Limited**
a.k.a.	MARG
Country	Chennai, India
Principal Activities	real estate development and management; investment in utilities, SEZs,
Date Established	1994
No of Employees	350
Exchange	Bombay, Madras, Luxembourg
Symbol	n.a.
Chairman	G R K Reddy
Financing	1995 IPO

Subsidiaries/Associates/Affiliates

Name	Location	Holding
Signa Infrastructure India Limited	India	74.00%
Power Substation, Alstom	Karnataka	-
Wind Farm, RCI Power Limited	Andhra Pradesh	-
Power Project, Enercon India	Maharashtra	-
Wind Farm, Nuziveedu Seeds Ltd	Karnataka	-
Power Project, BHEL	Andhra Pradesh	-
Wind Farm, Asian Wind Turbines	Andhra Pradesh	-

Developments and Projects

Name	Location	Holding
MARG Swarnabhoomi	Puducherry	-
Technopark Digital Zone I	Chennai	-
Technopark Digital Zone II	Chennai	-
MARG Square	Chennai	-
Riverside Mall	Chennai	-
Oakwood Rsidence	Chennai	-
Tapovan Residences	Pavunjur	-
Tranquil Cove Villas	Siruseri	-
Ramlakshmi Enclave	Tenali	-
Karaikal Port	Puducherry	-

Appendix 5 – Secondary (sub) Developers, Middle East

Secondary Developers - Middle East	
Al Qudra Real Estate	Abu Dhabi
Burooj Properties	Abu Dhabi
Hydra Properties	Abu Dhabi
Aqaar	Ajman
Star Giga	Ajman
First Bahrain	Bahrain
Gulf Holding Company	Bahrain
Abyaar	Dubai
ACI Real Estate	Dubai
Al Attar Group	Dubai
Al Fajer Properties	Dubai
Al Fara'a Properties	Dubai
Al Habtoor Group	Dubai
Al Manal Development	Dubai
Al Rashid	Dubai
Al Rostamani Group	Dubai
Al Seef Investment	Dubai
Al-Futtaim Group	Dubai
Bonyan Emirates Properties	Dubai
Cayan	Dubai
Cirrus	Dubai
Deyaar	Dubai
Diamond Investments	Dubai
Fortune Group	Dubai
High Rise Properties	Dubai
IRIS	Dubai
KM Holding	Dubai
Omniyat Properties	Dubai
Plus Properties	Dubai
Saba Properties	Dubai
Schon Properties	Dubai
Tamweel	Dubai
Union Properties	Dubai
Maison Ltd.	Hong Kong
Al Mazaya Holding	Kuwait
Barwa	Qatar
First Qatar	Qatar
RAK Properties	Ras Al Khaimah
Rakeen	Ras Al Khaimah
Al Akaria	Saudi Arabia
Al Bergal	Saudi Arabia
Dar Al-Arkan	Saudi Arabia
SNASCO	Saudi Arabia
Taiba Holding Co.	Saudi Arabia
MBI International	United Kingdom