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## Skyscrapers in the context of Amman, Jordan

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### **Biography**

He graduated from the University of Jordan in 1985 in architecture (B.Arch). He received M.Phil in Architecture in 1986, and Ph.D in 1989 in the field of urban design from University of Nottingham, England. He worked at FRHJ Architects, one of the famous practices in U.K. at their London office. Since 1990 he worked as Assistant Professor at Architecture Department, University of Jordan and now he is Associate Professor. He is the author of one book and 30 papers. In 2000 he awarded honour Diploma in Architecture from Cambridge, and in 2001 became a fellow of American Biographical Institute. (ABI)

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### Abstract

The development of skyscrapers in Greater Amman through the 20<sup>th</sup> century was to some extent reasonable and none of them exceeded 90 meters in height. Since the beginning of the 21<sup>st</sup> century and precisely since 2001 skyscrapers started to be constructed in spontaneous manner at any location or zone, even residential. Amman has followed distinctive development trajectories that reflected both the interactions of global forces and local community. The primary global force of Amman is the competitive international environment engendered by economic globalization that moves the city towards an attractive location for investment. This competition is manifested in the development of the high rise section of the proposed new strategic plan for Greater Amman City 2007-2025 to impact the desire to attract multinational corporations and specialists. Amman's situation is a mixture between state control and economic liberalism in which urban development is determined by the planning vision of attracting foreign investment and reducing restrictions to free enterprise.

**Keywords:** skyscrapers, legislation, urban development, urban design, style

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### Introduction: Urban design in Amman:

Amman is a modern city, although its history dates back 9000 years (Darwish, Meo, 1985). In 1878, a group of Circassians settled in Amman from the Turkish Empire from which grew the first settlement at the beginning of the 20th century. In 1922 Amman became the capital of Jordan. (Bowersock, 1977). The growth of Amman was influenced greatly by the political situations of the region. Between 1920 and 1948 the growth of Amman was relatively slow and the local materials of masonry and sand were used. Amman's total area then was estimated to be only 5 square kilometers (Greater Amman Municipality, 1987).

In 1948 a huge number of refugees coming from Palestine settled in Amman. The total population increased to about 225 thousand inhabitants. In 1956 the municipality of Amman introduced the first comprehensive plan for Amman's future extension. The Abdali district started to appear at that time (Greater Amman Municipality, 1987). The international style started to dominate the public buildings of Amman, with the importation of building materials from different parts of the world. The dwelling architecture remained intact during this phase (Masud, 1996). The Abdali district was first used for commercial space and offices. In 1967 a large influx of refugees arrived in Amman due to the Arab-Israeli war of 1967. The total population reached over 550 thousand and the area of Amman increased to 160 square kilometers. Between 1967 and 1976, some high rise buildings started to appear in the city skyline, but the total height of any did not exceed 40 meters or 12 floors (Greater Amman Municipality, 1986). A mixture of

land use began to spread throughout the city, especially at Abdali, and the privacy of residential houses began to be lost.

In 1987 the total inhabitants reached 960 thousand, and the area of Amman reached 350 square kilometers, when the Greater Amman Municipality (GAM) was established. The population exceeded one million for the first time in 1989. In 1988 the metropolitan comprehensive plan for Greater Amman was developed. This phase was marked by the advent of erecting high rise buildings in excess of 100 meters in the Amman area. In 1991 a sudden increase in the population accompanied the Gulf War due to Jordanian workers returning from Kuwait and Iraq. This put pressure on Amman's infrastructure and increased the value of lands, therefore putting much pressure on the middle and low income housing projects (Greater Amman Municipality, 2003). In 2004 the population of Amman reached 2.03 million, and the total area reached 677 square kilometers. (Municipality of Amman, 2005). The third Iraqi war in 2003 did not produce a huge influx of people returning to Jordan at the beginning. Only a few demands on middle and high-class housing projects especially for Iraqis accompanied this era (Statistical development of Jordan, 2005).

Since the 1990s, Amman has witnessed the building of several high rises which did not exceed 90 meters in height and the non human scale buildings started to appear (Tukan, 1995). The 21st century began with the erection of over 110 meters of building that miss this historically maintained human scale. In 2003, the

completion of building Le Royal, which is a five star luxury hotel situated in a residential district, made it the highest building in Amman with 33 floors and a total developed area of around 118,000 square meters (General Mediterranean, 1999). Le Royal became the highest point in the city's skyline and therefore performs a significant role in defining the city to outsiders and residents (fig 1). The race to build the highest skyscraper in Amman has become the major game ever since.



Fig 1: Le Royal building

Source: Greater Amman Municipality, 2007

Jordan Gate's twin towers construction project started by the year 2005. It will become the highest building in Amman after its completion in the year 2007. Each tower has 39 floors and is about 150 meters high with a total developed area of 220,000 square meters. The site of Jordan Gate is in the western section of the city of Amman, near the main road connecting Amman to its airport. The area of the site is too small for such a construction; 28,500 square meters. The project will be visible from all parts of the city of Amman due to its hilly properties. The cost of the project will be around US\$300 million. The Jordan Gate project has a large podium connecting the two towers that incorporates a large shopping center. It will host the five-star luxury hotel Hilton International, business offices, a large atrium, a commercial center, recreational facilities, storage, meeting rooms and restaurants (fig 2).



Fig 2: Jordan Gate building

Source: Greater Amman Municipality, 2007

The Abdali site, which will become the home for seven new skyscrapers in Amman, was originally intended for army and military administration. It is

located in the western section of the city near the city center (fig 3). The site area is around 350,000 square meters, with a developed area of over one million square meters. The project will cost over one billion US dollars. The infrastructure for this project is nearly completed and the construction will start at the beginning of the year 2006 and is expected to take several years. Concern with economic performance has dominated the urban agenda of Amman since 2003 when the National Resources Investment and Development Corporation announced the launch of the Abdali urban regeneration project in partnership with Saudi Oger, a leading international developer (National Resources Investment and Development Corporation, 2004).



Fig 3: Abdali new Project.

Source: Greater Amman Municipality, 2007

The seven new skyscrapers of Abdali vary in height from 100 meters, reaching to 220 meters. The 220 meter skyscraper will become the highest in Amman.

### Conceptual Framework and hypotheses of the research:

The existing situations at GAM in terms of locations of skyscrapers and of their architectural style are poor. The construction of skyscrapers in the old strategy of Amman could be at any site or zone, regardless of size and use. The law Number 67 for the year 1979 and its later amendments in 1984 and 1993 as well as the latest one, Number 21 for the year 2005, did not put many regulations regarding construction of high rise buildings. The political ideology of the city plays an important role in the globalization process as described by Newman and Thornely, which is currently taking place in Amman (Newman, Thornely, 2005). In the U.S.A. city planning is undertaken by different developmental agencies with limited participation of the city-region scale, while in Western Europe the state is involved in urban development and planning. Amman's situation is a mixture between state control and economic liberalism in which urban development is determined by the planning vision of attracting foreign investment and reduced restrictions to free enterprise.

This research has many objectives; among them:

1. Studying the development of high rise buildings at GAM, focusing on its major problems.

2. Studying the architectural style of the existing and proposed skyscrapers at GAM.
3. The main principles of constructing high rise buildings is described and analyzed.
4. The section of construction of tower buildings in the new strategic master plan 2007-2025 is studied and appraised accordingly.

### **History of high rise buildings in Amman**

Before 1966 there were only three buildings exceeding 10 meters in height, randomly located throughout Amman. Although they were shorter than 40 meters, they were considered high rise buildings in Amman (Al Abidi, 1995). They were the Philadelphia Hotel in the city center, the Jordan Intercontinental hotel in the Zahran district and the Insurance Company building, also in Zahran district. Between 1966 and 1979, eight high rise buildings varying from 40 meters in height to almost 90 meters were erected. The highest of them was the Tower Office Building in Zahran district. Five of these high rise buildings were hotels.

During the 1980s, only four high rise buildings were found varying in height between 30 and 50 meters (Bani Hani, 1996). During the 1990s, the numbers increased to 16 reaching almost 100 meters in height. The location selected for the high rise building could be in any part of the city, regardless of the land use plan laid out by the GAM (Municipality of Amman, 2002). The high rise building could be easily erected next to a residential building or plot by an administrative decision. The allowable height of the high rise could also be easily increased according to an administrative decision. Many administrative decisions can be easily taken, thus confusing the whole planning theme of the City of Amman. Despite the topography of Amman, which consists of several hills, (varying in height from 700 meters to 1050 meters) the human scale can still be seen and felt all over its urban fabric. These new skyscrapers will gradually change the human scale of the skyline of Amman.

The Law number 67 for the year 1979 allows any building to be built even if it is against the rules if a fine or penalty is paid. This penalty varies from several US dollars to thousands, according to the problem the building is facing. The regulations of high-rise construction in Amman need development and this law is the main tool for construction of spontaneous high rise buildings, thus causing major problems, not only to the built environment but also to the public open space around. For example the fine paid for constructing Le Royal reached U.S. \$ 1.5 million and only the Prime Minister had the authority to permit its building. A decision was made to pay the entire fine and proceed with the building. Even the new Law number 21 for the year 2005 has stated several points to be taken into consideration when designing any high-rise building in Greater Amman, although the law leaves a lot to be

desired. One of these rules is to have a street next to the suggested high-rise building of a width not less than 16 meters, which is, in the opinion of many local architects and planners too small. In the previous law and regarding the setbacks, the law stated that the building must be recessed 0.25 meter from all directions for each floor above the fourth level (Greater Amman Municipality, 1986), which has been increased in the new law to 0.5 meters. The new law stated that any high rise building can be constructed at any place even in residential zones (Law Number 21, 2005).

Mostly the western skyline image follows the "value of land" diagram as Gosling and Maitland (1984) explained. They said, "The economic functions of the city are so fundamental to its purposes that their symbolism in terms of land values forms a precise shorthand description of its differentiated structure. It is commonplace that the form of the modern city tends towards a three-dimensional representation of land values, most graphically in the case of Manhattan, while a land value model, such as that constructed for the city of Copenhagen, is itself a caricature of contemporary urban form." The situation at GAM is a little bit different, because of its hilly characteristics. The city center has not incorporated high rise building in its urban fabric despite the high land value.

### **Architectural style of the 21st century skyscrapers at Amman:**

Despite the post-modernist style of Le Royal, its shape appears rigid and throwback in its discipline for functionality. The post modern style as it appears in the design of Le Royal does not belong to the city of Amman. Most people and even architects see it similar to a large ship in the middle of the city. By contrast, traditional design forms provide simplicity, with richness and dignity. (Abu Ghazalah, 2006). Le Royal was designed to be visible from all over Amman. The building has a large podium with a height over 45 meters that does not fit with adjacent streets and with the urban environment. The designer imitated the form of the spiral minaret of Samara in Iraq and its oval plan built during the Abbasid period in the 9th century. An open spiral staircase accessible from outside the building and subject to strong wind surrounds the outer shape of Le Royal, especially during winter. This outer staircase ascends more than 8 floors, and contains 200 steps. A tall atrium is located inside its core with a luxurious atmosphere of stained glass, mosaic floors, and wood and bronze walls. (General Mediterranean, 1999). The revivalism of the spiral minaret of Samara, or the Abbasid architecture, does not really appear obvious or relate to the local architecture as the questionnaire shows.

The Jordan Gate skyscraper consists of two identical towers. The style of the two towers is international where the main façades make use of glass as a cladding system. There is no utilization of any traditional method of construction or material (Gulf

Finance House, 2005). The construction of the new skyscrapers of Jordan Gate will redefine the city's skyline and will require a certain level of technology and the adoption of modern materials in the building process, both of which may not be found in Jordan. Upon completion, which should be in late 2007, it will become the highest building in Amman, surmounting Le Royal. Skyscrapers represent the state of power, as Frampton mentioned, and these monumental structures that redefine and shape our cities' skylines are becoming a good indicator of the capability and power of an economy (Frampton, 1981).

The design of the Abdali seven skyscrapers is not yet finished, but clues to their image clearly indicate clearly their style. Six of them are modern and the highest one has high technology style, as the famous designer, Foster, shows in his sketches (fig 4). Traditional treatment to high rise building is missing in all designs at Amman. There is no single skyscraper that contains or incorporates traditional treatment or solution in its design. Traditional buildings used different climatic solutions to overcome the disadvantages of climate, such as courtyards, wind towers, mashrabiyyas; the wooden lattice frame to reduce glare and prevent heat, domes, barrel vaults and others (Danby, 1963). Post-modern style made use of these elements in a modern way and several projects that have been built in the Middle East emphasize this.



Fig 4 Foster's highest skyscraper at Abdali.  
Source: Greater Amman Municipality, 2007

The Bonyan group association, based in the United Arab Emirates, is planning five high rise buildings to the south of Amman along the major road connecting GAM to Queen Alia airport. The highest building will rise 54 floors, or 190 meters, and the smallest one will rise 35 floors, or 123 meters. It will host a large shopping mall,

residential apartments, health clubs, a hotel and other facilities and parks. The association is planning to invest over US\$350 million in this project. The design of the high rise building will be international style like other high rise buildings in GAM (Bonyan Group Association, 2006).

### **New master plan for Greater Amman 2007-2025 and the construction of skyscrapers.**

The aspiration of the new master plan for GAM is to develop it into a green, efficient, sustainable and modern city with preservation of its human scale and cultural heritage. Clustering high rise building in one zone will create a better sense of community, reduce maintenance and may achieve sustainability. The new master plan will consist of four detailed master plans that will be introduced by the end of 2008: 1. The land use plan, which will be dealing with all kinds of development at the unzoned area of existing GAM. 2. The transportation plan which will be dealing with the road network and ring road construction and about developing public transportation into a more useful and efficient system, which will include the introduction of trains. 3. The open space plan which should provide for sufficient green areas and public parks that GAM currently lacks. 4. The heritage and culture plan which will maintain the existing heritage sites and develop more archaeological sites within GAM. This research will discuss the first category only.

The land use plan, which will be dealing also with the construction of skyscrapers, is associated with previous legislation discussed before (Law Number 21 for the year 2005). The new strategy for GAM indicates that new high rise buildings should not alter or damage the human scale of GAM. The existing predominantly four storey structures should continue in the future. They stated in their strategy that the two examples of Le Royal and Jordan Gate high rise buildings have a negative impact on the urban form and character of Amman, and will damage the nearby infrastructure and transportation system (GAM New Strategy Report, 2007).

Tower development is essential for a modern city, but the careful selection of its sites will ensure and encourage intensification of growth rather than sprawl and will meet the investors' demands. Three types of zones are selected according to the new strategy. The red zone means that it is not allowed to build any high rise structure under any circumstances.

The red zone contains the areas of royal courts, heritage sites, religious buildings, landslide areas, restricted buildings, industrial lands and stable areas as seen from fig 5. The orange zone means proceed but with caution in building towers. The green zone means proceed in building towers. These are chosen according to their accessibility to major transportation roads and infrastructure (GAM New Strategy Report, 2007).

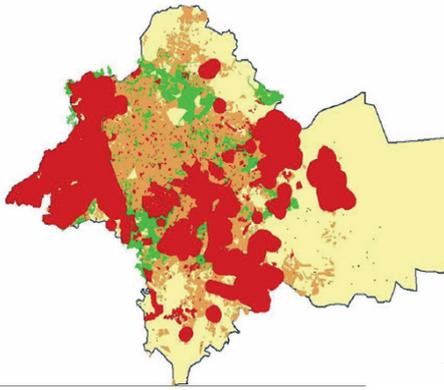


Fig 5: The red, orange and green zones for high rise construction at GAM proposal. Source: GAM, 2007.

As mentioned before, Amman is a hilly city and this makes the problem of introducing high rise building even more difficult to solve. A study has been made by the team of a new strategic plan on the best location of the towers in a hilly area (see fig 6). In a respond to topography, the best location according to the GAM study is the lowest points. The position of towers at high level will adversely alter the human scale of Amman's city, while the lower positing of them will have no great impact (fig 7) (GAM New Strategy Report, 2007).



Fig 6. Positioning of towers on hill top.

Source: GAM, 2007.



Fig 7: Positioning of towers on hill base.

Source: GAM, 2007.

### Discussion of the proposed tower vision at GAM:

GAM asked an international Canadian firm to make a study for the construction of high rise buildings which after extensive analysis to urban planning and design at GAM resulted in the following:

The construction of future towers is proposed to be placed into four main communities (fig 8), where selected areas are choused for the building of high rise towers taking into consideration the existing infrastructure, the historical heritage sites of the city and the existing rich urban fabric of GAM. The four selected sites are:

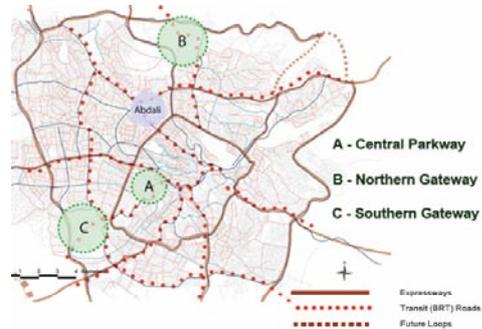


Fig 8, The site of the four proposed areas for towers at GAM.

Note: The Abdali site is the "D" zone.

Source: GAM, 2007.

A: Central parkway: a parkway development is proposed to contain a medium high rise structures that should not exceed 81 meters in height alongside the valley corridor next to the Abdoun Bridge (fig 9). The skyline of GAM is taken into consideration when proposing this zone. Zone A is located south of the city center of Amman and has many vacant lands. The proposed zone is alongside a major road under construction that is 4.5 kilometers long and has nearly no buildings at all around it.



Fig 9, Proposed towers at zone A.

Source: GAM, 2007.

B: Northern gateway: (fig 10) located alongside the outer ring road called Jordan Highway. The area is located close to the existing Northern Bus Terminal, and is expected to be readily served by public transit in the near future. The proposed high rise constructions are located in the lower areas of the topography that should not exceed 104 meters high. This zone is also nearly vacant, but has an area larger than zone A. The roads are also longer reaching more than 8 kilometers long.



Fig 10, The proposed towers at zone B.

Source: GAM, 2007.

C: Southern gateway: (fig 11) located at the beginning of the Airport Road south of GAM. The center of the area has been reserved for a major shopping street surrounded by low density development; high density clusters are located on the periphery of the area with a maximum height of 93 meters according to the topography of the area. Zone C is even larger than the previous two zones. It will have high rise developments alongside four main roads that will reach 13 kilometers long. This new proposed zone has different character than the previous two in terms of having residential and commercial development at its core. It will also be on a vacant land.



Fig 11: The proposed zone for towers at C.

Source: GAM, 2007.

D: Abdali, which had been selected several years ago, as mentioned before, will en-corporate a major urban regeneration project that will become the new center for finance and commerce for GAM. It will consist of a mixed-use development, ranging from office, commercial, hotel and residential development, including public parks and facilities such as a new municipal library. The maximum height for buildings is not yet determined, but clues to allow any figure appear clearly. Already the highest proposed building exceeds 220 meters high (GAM New Strategy Report, 2007). Abdali zone is different from the three other zones in terms of many aspects: First it is next to the city center. Secondly it has high urban density around it. Thirdly it has three

main major roads surrounding it that can not be widened in the future. Fourthly it has a high elevation relative to other zones (almost 900 meters above sea level). Zones A and C have low elevations, about 700 meters, while zone B has the highest, almost 950 meters.

After careful analysis of the previous material, several questions can be raised that need explanation of justification from GAM.

1. The land use plan shown in figure 5 has divided the city into three parts; red, orange and green regardless of any use. Residential districts as well as commercial or any other type of zone can build a high rise building which is not reasonable and convenient for inhabitants. Several other studies indicated and supported the segregation between private dwellings and skyscrapers, which is not respected in the new GAM strategy.
2. The land use plan location of high rise building is different from the tower vision introduced in figure 8. Figure 8 shows three new locations for construction of high rise buildings determined in a different way from the previous one. Figure 5 did not take in any consideration to the topography or to the other study on the best location of the towers in a hilly area shown in figure 6. It is mainly a development of high rise buildings alongside major wide roads regardless of any other implications.
3. Three different models of tower development are adopted in the four zones discussed before. Zone A has a development alongside a route, while zones B and C are within a block, almost square, that will have residential quarters in the middle, while zone D is a completely integrated zone for high rise buildings. The core of the zones B and C will be in a bad situation after constructing the proposed towers. They will suffer from traffic congestion and noise.
4. The estimated area of the four suggested zones for tower construction will be around 30 square kilometers which is twice the size of city center of Amman and almost two-thirds the area of Manhattan, New York, despite the large difference of population for the both cities. The suggested area for constructing towers is too large for a city like Amman, even if its population reached 6 million as estimated by the Mayor of Amman by the year 2025. This huge suggested zone will cost the GAM a large amount of money to lay down its infrastructure. It is suggested by the strategy that these costs will be calculated and the investor will pay most of it. The investors will not be happy if these calculations are high and will probably invest in another city.

### Conclusions:

The study of urban design elements should be applied first on each district of GAM before deciding where to construct a skyscraper. A map showing the location of suggested sites for constructing new skyscrapers within each district should be then suggested according to their impact on the city's urban design, contrary to the existing situation where the investor decides the location of his skyscraper. The skyscrapers

should be first studied carefully in terms of their effect upon the urban design of the whole city as Ford, 1998 explained and their style should also be carefully selected as its design will impact the image of the whole city (McNeill, 2005). The nature and topography of Amman, which is seen as a primary factor in determining Amman's skyline should be taken into consideration in any future development plan for the city.

The proposed high rise construction at the hill base will definitely result in better environment, where the bad location of our two case studies mentioned before, Le Royal and Jordan Gate, at the hilltop is the evidence. But the careful selection of zone type at the core of the zone is of extreme importance. A residential district is normally surrounded by green area and buffer zone in nearly all cities around the world, based on the Garden City and New Towns concepts (Cherry, 1974). The new suggested strategy of surrounding the residential quarter with high rise building is completely new and should be studied carefully before any implementation. The four proposed sites need a complete new infrastructure to accommodate this large new development of high rise towers, which is still not provided and the investors will re-think in constructing high rise buildings if the cost is too high.

A revision of the existing planning legislation to provide appropriate legal basis for any future implementation of the master plan is urgently needed. The last existing law for the year 2005 (No. 21) is obviously encouraging construction of high rise buildings in random fashion and in residential quarters as well (Law number 21 for the year 2005, 2005). Several factors should be taken into consideration when suggesting alternatives to the Law number 21 for the year 2005. Among these factors is the building line along the street in relation to the setbacks. Setbacks alone cannot be the only criterion. The second factor is the form in terms of its width and shape and its effect upon the ratio of open space. The third is the building height and its effect upon the city skyline. The fourth factor is the style of the building. The fifth factor being anticipating the public opinion of the inhabitants when suggesting building skyscrapers. The recent situation of ignoring their participation cannot continue, as these people will be the main users in the future. The sixth factor is the pedestrian movement within these large structures.

The proposed new law for constructing high rise building should incorporate a section regarding the style of the new skyscraper. The post modern style evident at Le Royal and the international style at Jordan Gate are examples of ignoring traditional treatments in high rise structures. The climatic situation, cultural beliefs, social and economic factors that formed traditional architecture in the past differ from one country to another, casting doubt upon the trend of universality in skyscraper design (Clark, 1980). The revival of the use of traditional

elements of the past might be the answer to the design of the new skyscrapers in Jordan, and in the Middle East. The revival use of courtyards, the use of wind towers, the use of mashrabiyyas, the use of new materials that overcome the disadvantages of climate, like fiberglass and Teflon, are all seen as answers to the problems previously discussed. There are many examples starting to take place at Gulf States and Saudi Arabia that can give a clue for such development. The famous Kuwait mushroom shape with different heights according to the required water pressure designed by the Swedish architectural firm VBB (Vallenbyrnadsbryan) is a new form with a good aesthetic effect. The conical shape of the mushroom is ergonomic. These water towers soon spread to all parts of the Middle East. The two skyscrapers in Riyadh Al-Faisaliah and the Kingdom are other fine high-rise examples designed by famous architects on an international level that incorporated the latest technology in their design and shape. In Dubai, several high-rise buildings were erected that had special treatment to elevation and structure, such as Burg Al-Arab, the famous luxury hotel. The aforementioned examples have a variety of good qualities, such as good selection of site and use of available open space, the adaptation of local environmental conditions, and their aesthetic shape.

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