



“Ever-growing Amman”, Jordan: Urban expansion, social polarisation and contemporary urban planning issues

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A B S T R A C T

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Amman the primate capital city of the Hashemite Kingdom of Jordan currently has a population in excess of 2 million, but in 1924 it consisted of little more than a collection of dwellings and some 2000–3000 inhabitants. The present paper sets out to document and explain the phenomenal expansion of “ever-growing Amman”. The physical geography of the urban region and the early growth of the city are considered at the outset and this leads directly to consideration of the highly polarised social structuring that characterises contemporary Amman. In doing this, original data derived from the recent Greater Amman Municipality’s Geographical Information System are presented. In this respect, the essential modernity of the city is exemplified. The employment and industrial bases of the city and a range of pressing contemporary issues are then considered, including transport and congestion, the provision of urban water under conditions of water stress and privatisation, and urban and regional development planning for the city. The paper concludes by emphasizing the growing regional and international geopolitical salience of the city of Amman at the start of the 21st century.

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Introduction to Amman: a modern metropolis of geopolitical significance

The growth of Amman in the second half of the 20th century through to the start of the 21st century has been phenomenal, in terms of its population, physical extent and regional geopolitical importance. Recently, [Al-Asad \(2005\)](#) has referred to what he describes as “ever-growing Amman”. What was in the early 1920s a small town of little more than 2000–3000 people is today a major regional city with a recorded population of 2.17 million people at the end of 2006 ([Hashemite Kingdom of Jordan, 2006](#)). And the phenomenal growth of the urban area in both size and significance has occurred in “drastic growth spurts that have transformed the look and feel of the city...and its connections with the outside world” ([Al-Asad, 2005](#)).

Such growth spurts have also meant that although geopolitically Amman currently stands as one of the most important cities in the modern Arab world, one of its major characteristics is that it is, for the most part, a thoroughly modern metropolis:

“Amman is a modern Arab city rather than a great, ancient metropolis of the Orient: it has never rivalled Damascus or Cairo

as a grand Islamic city of antiquity.” ([Ham & Greenway, 2003: p. 98](#))

“...the weight of history that is a constant presence in the heart of most Middle Eastern cities is manifestly lacking, replaced instead by a quick-witted, self-reliant dynamism...today there are parts of West Amman (that are) indistinguishable from upscale neighbourhoods of American or European cities, with broad leafy avenues lined with mansions, and fast multi-lane freeways swishing past strip malls and black-glass office buildings” ([Teller, 2002: p. 75–77](#)).

As the latter quotation suggests, the social transformation of the city during this period has been no less spectacular. [Abu-Dayyeh \(2004a\)](#) reports that at the time of the 1952 Census, when the population of Amman stood at around the quarter of a million mark, as much as 29% of the population was living in tents, and a further 8% of the population were dwelling in natural caves. By 2006 there were few inhabitants of what can be referred to as temporary or makeshift settlements, and as we shall shortly see in detail, modern-day Amman shows marked socio-spatial polarisation between its wealthy neighbourhoods on the one hand and its poorer socio-economic quarters on the other. And in this respect again, Amman appears as a ‘modern’ metropolitan centre, albeit one that also shows distinct traditional and informal characteristics at the local or micro-level (see [Abu-Dayyeh, 2004b](#)).

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One of the few previous reviews of the city of Amman, written by Kadhim and Rajjal (1988) traced in detail the growth of Amman from prehistoric times to the 20th century, emphasizing the significant, although irregular growth of the city. This paper was written at about the same time as the appearance of the *Comprehensive Development Plan for Greater Amman, 1985–2005*, which is reviewed toward the end of the present paper. Accordingly, the present article focuses principally on the period since 1985, stressing the contemporary city, its structure and challenges. Kadhim and Rajjal (1988) concluded their 1988 piece by noting: “Amman is looking to the future with new confidence and hope, as the turmoils of the last few decades recede into the past” (p. 325) and stressing what they saw as “the now inherent political stability of the country”. As we shall see, such comments were indeed prescient.

The present paper thereby seeks to document and explain the phenomenal growth and expansion of Amman in the period since the 1920s. In doing so, the early growth of the city is outlined, before its phenomenal expansion in the 20th century is documented. This leads to the direct consideration of the pronounced social structuring that characterises contemporary Amman, using recent innovative GIS-derived data. The employment and industrial bases of the present city are then overviewed before we turn to a range of pressing contemporary urban and regional planning issues, which reflect the rapid growth of the city and its increasing geopolitical salience in the wider Middle East and North Africa

(MENA) region. These include transport and congestion, the provision of urban water under conditions of water stress and the privatisation of the water supply between 1999 and 2007, and plans for the future growth of the city region. The conclusion to the paper focuses attention on the ever-enhanced regional and international standing of the city in the wider world.

The physical environment of the city

Amman is located on the undulating plateau that makes up the north-west of Jordan (see Fig. 1 for a general location map). The original site of the city occupied seven hills or ‘jabals’ around the Wadi ‘Ras el Ain which flows north-east from the plateau toward the River Zarqa basin. The original central part of the city was at an altitude of between 725 and 800 m. Expansion of the city in the past 25 years has resulted in the occupation of some 19 hills in total with an altitudinal extension to 875 m and above. The topography of the city consists of a series of steep hills and deep and sometimes narrow valleys. Most of the districts of Amman take their names from the jabals on which they are situated. While initially development was principally on the upper slopes and crests and the lower slopes of this hill–valley system, the upsurge in urban development over the last 60 years has seen extensive development on the frequently steeper mid-slope locations (see Photograph 1).

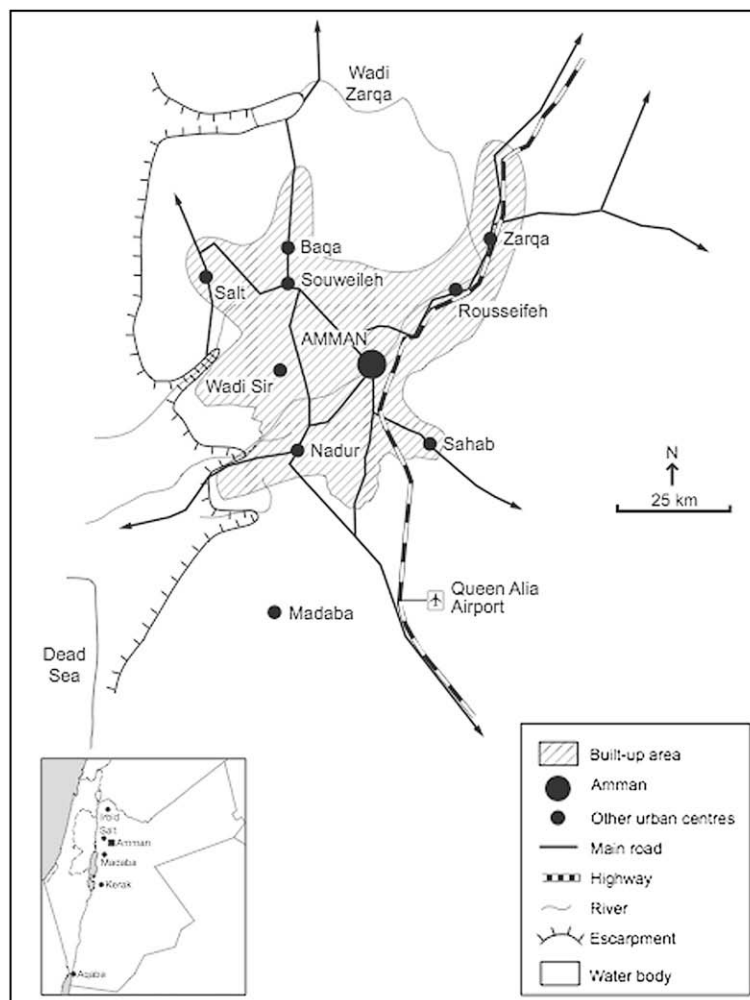


Fig. 1. Amman: general location map adapted and revised from Laverne (2004).



Photograph 1. A view over part of central Amman from the west of the urban core (Photo: Rob Potter).

Geologically, much of Amman is underlain by the Late Cretaceous Amman Silicified Limestone formation which is approximately 85 m thick and consists of thin- to medium-bedded heterogeneous lithologies, with alternating limestone, dolomitic chalky marls, white and brown cherts, chalk and silicified limestone, which is locally crystalline. The expansion of the city to the north has been over the older Late Cretaceous rocks of the Wadi As Sir Limestone, which is approximately 75 m thick and consists of medium-bedded dolomitic limestones inter-bedded with calcareous mudstones and silts and marls, and which frequently form a white to grey escarpment, with very steep slopes, where building requires terracing and revetments.

Climatically, like much of northern Jordan, Amman shows a distinct contrast between a relatively wet rainy season between November and April and the rest of the year, which is relatively dry. Climatic data for Amman are summarised in [Table 1](#). Because of the location of Amman on the upland Jordan Plateau, this broad twofold seasonal contrast can be further subdivided into the customary four seasons in the case of the city. Spring and autumn are of a relatively short duration, but are locally recognised as the most pleasant times of the year. Summer, extending from late May through to much of September, is a rainless period with average temperatures ranging from 28 °C to 32 °C, with characteristically low humidity and frequent breezes. The spring (parts of April and

May) and autumn (parts of September and October) have temperatures ranging from 23 °C to 27 °C. The winter period (from November through to early April) has night-time temperatures close or below zero, and snow occurs on occasion, particularly in December and January. Day-time temperatures during this period average between 12 °C and 21 °C. Winter rainfall is in the region of 300 mm annually, normally with the highest amounts in January and February. In recent years, however, these patterns have been less reliable, and in 2006, for example, over 150 mm of rain fell in April and May, while substantial snow fell in Amman on 14 March 2007.

The development of Amman and the growth of its population: “ever-growing Amman”

Amman was named after the Ammonites who originally ruled the area that makes up the present-day city. [Kadhim and Rajjal \(1988\)](#) argue that the year 1200 BC marks the origins of Amman as an urban settlement, as it was at this juncture that the Ammonites took the hill that dominates the present-day city centre as the site of their capital, Rabbat Ammoun. There followed a series of occupations, by the Assyrians, Babylonians, Persians, Greeks, Romans and Moslems ([Kadhim & Rajjal, 1988](#)).

Table 1
Summary of climatic conditions for Amman, Jordan (1975–2006)

Month	Average minimum daily temperature (°C)	Average maximum daily temperature (°C)	Relative humidity (am)	Relative humidity (pm)	Average precipitation (mm)	Average wet days (+0.25 mm)
January	4	12	80	56	69	8
February	4	13	78	52	74	8
March	6	16	57	44	31	4
April	9	23	53	34	15	3
May	14	28	39	28	5	0.8
June	16	31	40	28	0	0
July	18	32	41	30	0	0
August	18	32	45	30	0	0
September	17	31	53	31	0	0
October	14	27	53	31	5	1
November	10	21	66	40	33	4
December	6	15	77	53	46	5

In the 1860s, under the rule of the Ottomans, Circassian tribes, Moslems escaping religious prosecution from Russia, settled on the ancient site of Amman, especially around the seasonal stream that runs in an east to west direction. Their livelihood depended on cultivation on both sides of the stream. The next major development came with the construction of the Hijaz Railway in 1902. This served to link Amman directly with Damascus in the north and Medina in the south. The first Municipality Council of Amman was established in 1907 and at that time the settlement consisted of little more than 300 families. Photographs of the early modern urban area around 1924 show a small settlement in the locality of the present-day downtown area, with open land extending to the north and east of the Roman Ampitheatre (Chatelard & de Tarragon, 2006).

In 1921, Emir Abdullah declared Amman the capital of the new state of Trans-Jordan and from that point onwards, the city became the administrative and economic hub of the country. Indeed, it has been observed that the development of the city “was carried out in parallel with the construction of the state” (Lavergne, 1996). Unlike most cities that grow due to their economic functions, Biegel (1996) observe how the growth of Amman since 1907 has largely reflected wider political and geopolitical circumstances. Thus, the area continued to attract migrants and its political stability led to successive waves of migrants joining the city from Syria, Palestine, Lebanon and the newly formed Iraq. Further religious and ethnic minorities, such as the Kurds and Armenians also came to live in the city. In addition, throughout this period, Amman was the focus of domestic migration. The main factor promoting migration to Amman city has been its status as the seat of government. The government is the only receiver and distributor of “foreign rents”. People looking for a “rent” in the form of a job in part of the state apparatus have through time moved to Amman creating a “rent seeking mentality” which still dominates the behaviour of the political economy of the country. Thus, through the period from 1921 to 1947 Amman experienced a gradual spatial expansion. Its population was estimated at 10,500 in 1930 and 45,000 in the early 1940s, with the city extending over an area of some 2.5 km² by 1947 (Kadhim & Rajjal, 1988).

But it is Palestinians, displaced as a result of the foundation of the State of Israel in 1948 that have formed the main wave of migrants to Jordan in general, and to the city of Amman in particular. The population of Amman abruptly increased soon after 1948, as a result of the huge influx of refugees (Kadhim & Rajjal, 1988). The refugees were mainly accommodated in five hastily prepared camps. Two of these were sited in Amman, namely Al Hussein camp in the north of the city and Al Wehdah camp in the south. The camps lacked even the most basic of amenities and services.

As a consequence of such migration plus the strong internal rural–urban movement, the population growth rate of Amman has always been higher than that recorded for Jordan as a whole, standing at 9.6% in the 1950s, although reducing down to around 5% in the 1970s. At the national level, the rate of population increase has never exceeded 4%. As noted in the section on *The physical environment of the city*, the spatial expansion of Amman during the 1950s took the form of “climbing the hills and mountains” that surrounded the urban core.

The second major wave of refugees arrived in Amman after the so-called “Six Day War”, which occurred in 1967 between Israel and the three Arab states of Egypt, Syria and Jordan. Kadhim and Rajjal (1988: p. 319) note that this conflict sent the city into “another spiral of uncontrolled growth”, which served to increase its population from 330,000 before the conflict to around 500,000 shortly after it. During this period, while the overall population of the city expanded, no further refugee camps were developed in Amman. During this period, nine refugee camps were established in the central and northern parts of the country. The largest of these

was Baqa (see Fig. 1). Although this is located some 12 km north-west of the city centre, it now forms part of the extended metropolitan area. The immense spatial expansion of Amman between 1956 and 1967 is clearly discernible in Fig. 2. During the 1960s and 1970s, Amman experienced rapid suburban expansion, as can be seen from the Fig. 2. Such suburbanisation occurred in all sectors of the city, but in the north-west of the city it was particularly associated with more affluent residents. In the case of the north-western tracts of the city, the slightly higher lands were characterised by a cooler micro-climate.

The next phase of expansion, from 1973 to 1983 is often referred to as the ‘boom years’, based on the large contingent of migrants from Jordan who worked in the oil-rich states of the region (Kadhim & Rajjal, 1988), many of whom sent back substantial remittances. Throughout this period, the population of Amman continued to be boosted as a result of internal rural–urban migration, the settlement of nomadic tribes and the wars and crises that affected the region. The 1979 Census stressed that many families arrived in Amman via a process of chain migration, moving initially to smaller settlements before migrating to Amman. In addition, the settlement policies adopted by the state since the 1930s, toward the major nomadic tribes, contributed substantially to the growth of Amman and the other urban areas (Bocco, 1986; Lavergne, 1996). In addition, the Civil War in Lebanon in 1975, the First Gulf War of 1991 and the Invasion of Iraq in 2003 all led to dramatic population influxes into Jordan. The burgeoning spatial extent of the city and its rapid growth in all directions, including toward the north-eastern industrial town of Zarqa is apparent in Fig. 2 (see also Fig. 1 for a guide to areas).

By 1979 the population of Amman had reached 777,855 inhabitants, representing 52.6% that of Amman Governorate and virtually 30% of nation. By the time of the *Population and Housing Census*, conducted in 1994, the population had reached some 1,307,017, representing an increase of 54.6% since 1979. The last Census to be held in Jordan took place in 2004 after the creation of the geographically wider Greater Amman Municipality area, and by this date, the population of Amman Governorate had increased to some 1,726,713 inhabitants. Thus, at this stage, the population of Amman amounted to approximately 33.8% of the Kingdom's total of 5,100,981 in 2004. But with the war in Iraq, the population is currently continuing to grow at a phenomenal rate and in 2007 the Department of Statistics gave the population of Amman as 2.17 million out of 5.47 million for Jordan as a whole, which equals almost 40% of the national population (see also Al Rawashdeh & Saleh, 2006).

Notably, in addition, thousands of construction workers, primarily from Egypt and Syria, currently reside in the city. Unfortunately, there are no reliable statistics concerning the number of such migrant workers, as many of them reside in the city only temporarily, leaving to return to their places of origin as and when circumstances change. And the city is currently experiencing rapid land and rental hikes as the result of the settlement of Iraqis displaced by the war. In March 2007, the Ministry of the Interior estimated that there were as many as 1.4 million Iraqi nationals currently living in the Greater Amman urban area.

The polarised social structure of Greater Amman

A correlate of this history of rapid growth has been the marked social divide that has come to characterise the residential quarters of present-day Amman. Contemporary guides to Jordan comment directly on the marked social cleavages that characterise the urban space of the city of Amman:

“Residents talk openly of two Ammans, although in truth there are many. Eastern Amman (which includes Downtown) is home

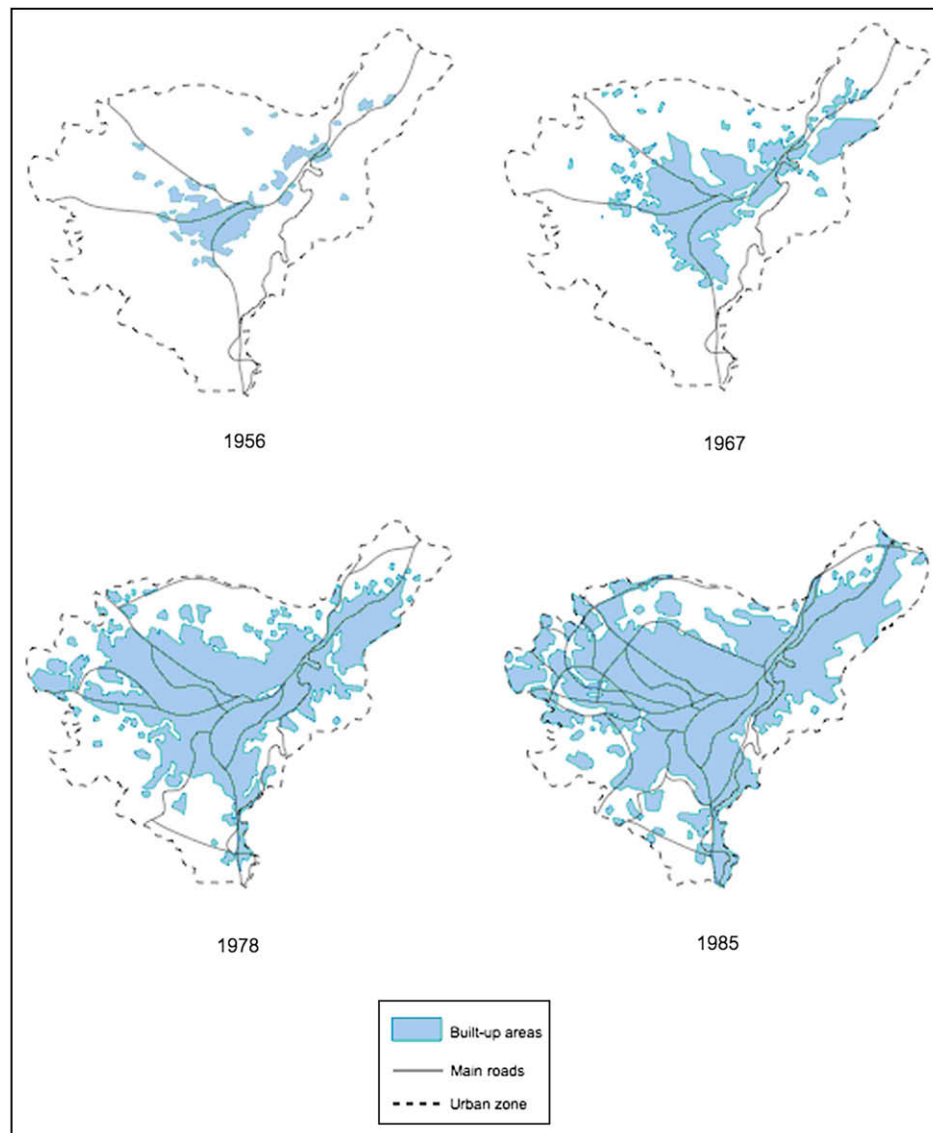


Fig. 2. The physical expansion of Amman 1956–1985.

to the urbanised poor: it's conservative, more Islamic in its sympathies, and has vast Palestinian refugee camps on its fringe. Western Amman is a world apart, with leafy residential districts, trendy cafes and bars, impressive art galleries, and young men and women walking openly arm in arm" (Ham & Greenway, 2003: p. 98).

"The upmarket district of Shmeisani is referred to by locals as 'Shiny Amman' while the Abdoun area sometimes, and not without a little irony, goes by the label of 'Paris' (Ham & Greenway, 2003: p. 98).

"Most of Amman's explosive growth in the last fifty years has been concentrated in respectable and upmarket West Amman; other districts to the north, south and east are much poorer, though more populous" (Teller, 2002: p. 78).

This picture of 'two Ammans' broadly depicts the concentration of relatively wealthy socio-economic groups to the west and, to a lesser extent, the north of the city (Hannoyer & Shami, 1996; Razzaz, 1996). This overall pattern is associated with the early growth of Jabal Amman to the immediate west of the downtown as the wealthy quarter. With the growth of the city, the high-status sector has extended westwards from the city centre. The

direction of movement has been toward the relatively high land to the north-west of the city, where as already noted, land rises to ca 1000 m.

In this way, higher land prices have always characterised this sector of the city and the high-income districts of Amman have shown a quintessentially Hoytian-style tendency through space and time, growing outwards to the north-west in a sectoral wedge-shaped pattern (Hoyt, 1939). Thus, today the western part of the city exhibits relatively low population densities in the region of 2500–6000 persons/km². In contrast, the eastern parts of the city have remained the habitat of relatively poorer groups and as the reception areas for recent arrivals, particularly refugees. Thus, the older residential areas of the eastern inner city which hail from the early 20th century, and which surround the present-day downtown, such as Basman, Al Yarmouk and ras El Ain are characterised by low-income residents living at high population densities, varying from 14,000 to 30,000 inhabitants/km² (Photograph 2). These areas include the Palestinian refugee camps of Al Hussein and Al Wehdat, mentioned previously.

But the 'two Ammans' version of the social structuring of the city is, of course, a very broad brushstroke picture concerning its contemporary socio-economic zonation. For planning and building



Photograph 2. High-density inner city residential areas (Photo: Rob Potter).

purposes, residential land within Amman is divided into four categories. The categories are based on the criteria of minimum plot size, the maximum percentage of the plot that can be built-upon, and the distance between residential buildings and the boundary of the plot. The categories are summarised by the notation A–D from the largest to the smallest. As we shall see presently, these four categories can be used as surrogates of the distribution of relative wealth within contemporary Amman.

Plots designated as category A have an area of at least 900 m² and the distance between the house and the boundary of the property must be at least 5 m at the front, 7 m at the back and 5 m

from either side. The built-up area should be no more than 39% of the plot, leaving space for 'green' areas. As shown in Fig. 3, category A residential land is almost exclusively located to the west of the Madeenah or city centre. The area forms a clear sectoral zone extending from around 1.5 km west of the city centre, out to the boundary of the Greater Amman Municipality (GAM). There is a secondary cluster to the north of the city and a very few plots to the south of the city. The Hoytian-sectoral nature of this high-status residential zone is clearly revealed in Fig. 3. Photograph 3 shows an opulent new build typical of the residential area of Abdoun to the west of the city centre.

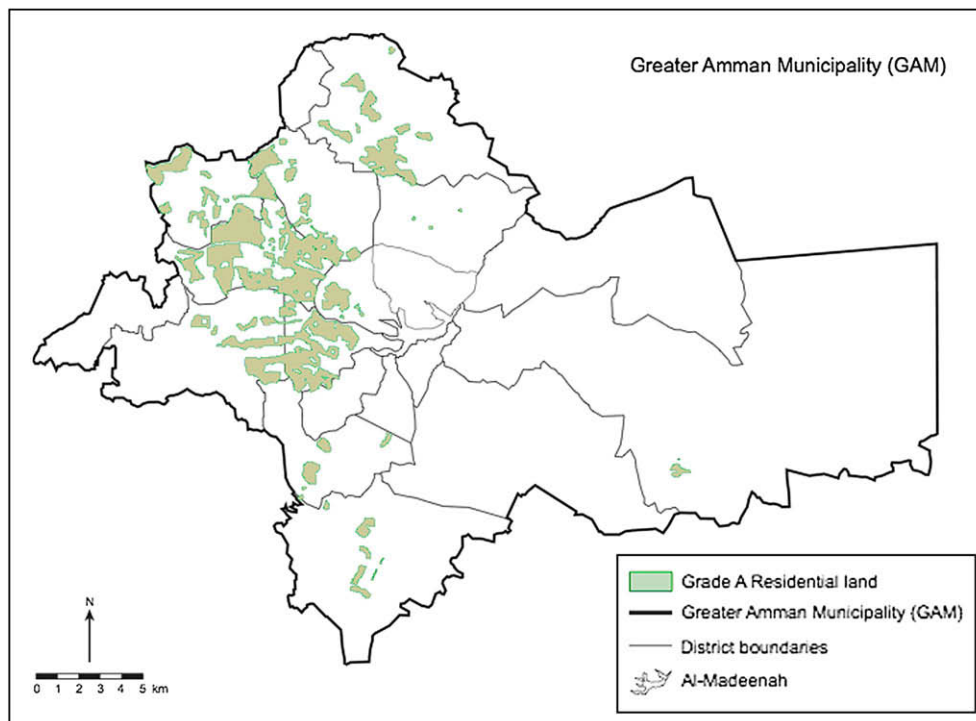


Fig. 3. 'Category A' residential land in Amman (adapted from original GIS data supplied to the authors by the GIS Department of the Greater Amman Municipality 2006).



Photograph 3. An opulent newly built house in Abdoun (Photo: Rob Potter).

Category B residential plots are between 750 and 900 m², with the house being more than 4 m from the front, 6 m from the back and 4 m from the sides. The built-up area of the plot can be up to 45%. Although overall category B residential plots are far more dispersed than category A plots, their remarkable concentration in the west of the city centre testifies to just how marked the divide is between the west and east of Amman (Fig. 4). Taken together, category A and B residential lands occupy entirely the western and northern portions of the city, reflecting larger residential plots sizes, more substantial buildings and higher overall levels of wealth and social status. In category A and B lands, residential taxes are higher, and urban

services such as street cleaning and water supply are more regular.

In contrast, category C land denotes plots of around 400 m², with residential buildings occupying up to 51% of the plot. Houses must be no nearer than 4 m of the front and back of the plot and 3 m from the sides. It is noticeable that such residential area plots are located throughout the city, including both the southern and eastern portion of the urban area (Fig. 5). If the pattern is looked at in greater detail, there is a broad zone of category C residential land encircling the Madeenah or central city. There are also two broad sectoral wedges extending to the south and a cluster toward the western edge of the GAM.

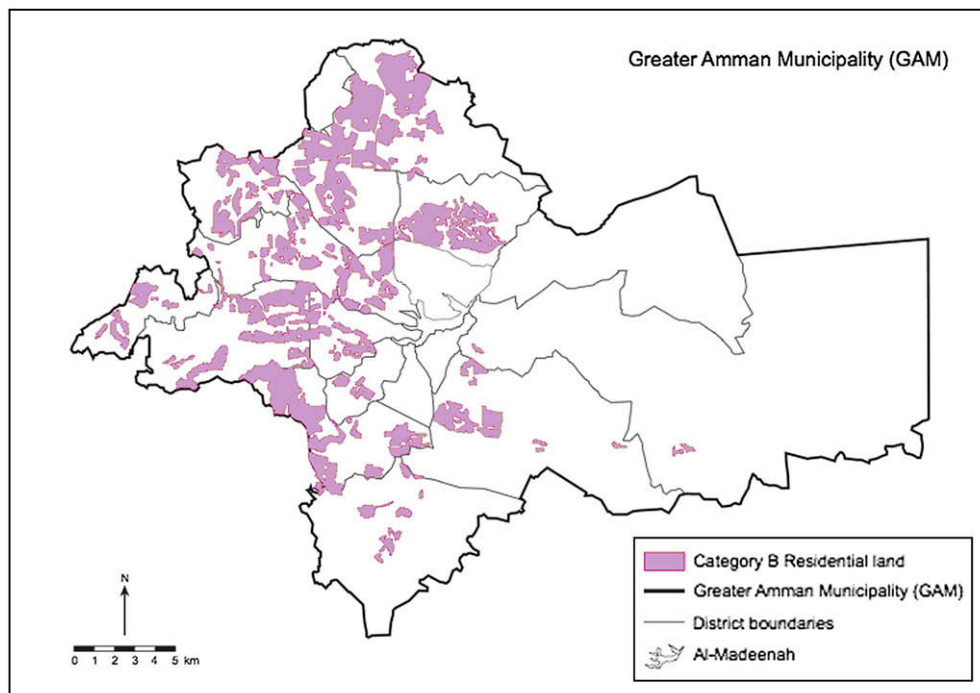


Fig. 4. 'Category B' residential land in Amman (adapted from original GIS data supplied to the authors by the GIS Department of the Greater Amman Municipality 2006).

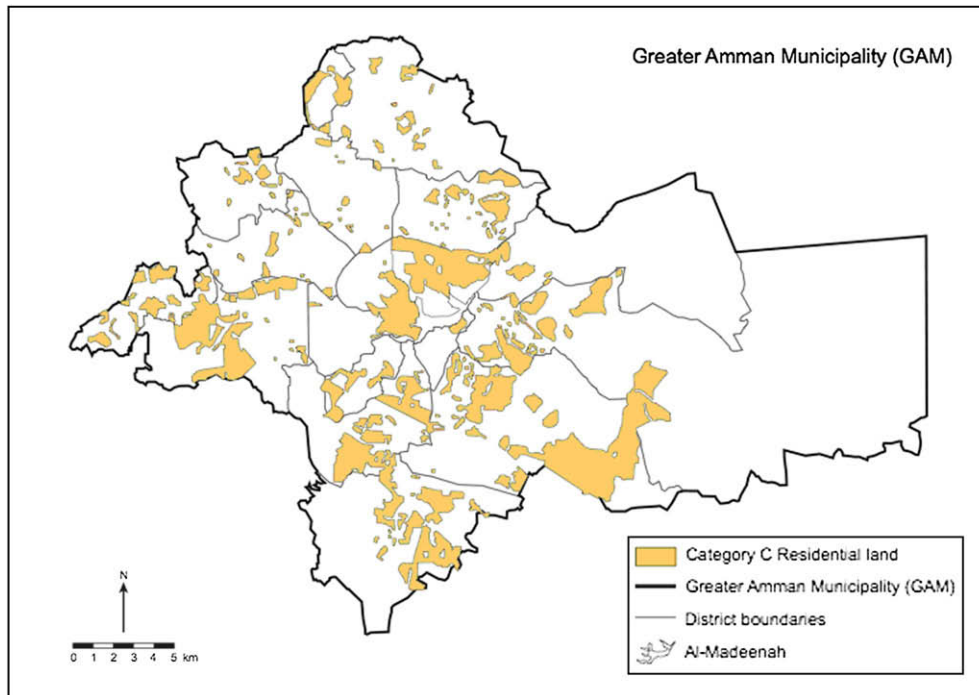


Fig. 5. 'Category C' residential land in Amman (adapted from original GIS data supplied to the authors by the GIS Department of the Greater Amman Municipality 2006).

Finally, category D describes smaller residential plots of up to 200 m², with a maximum permitted built-up area of 55%. The residential building should be no nearer than 3 m, 2.5 m and 2.5 m of the front, back and sides of the plot, respectively. It is noticeable that category D residential lands characterise the inner city, extending in a broad belt around al-Madeenah (Fig. 6). Particular concentrations are noticeable to the south and east of the downtown area (Fig. 6). In addition, the map shows two large areas to the

south-east of the city centre in the district of Al-Qwaismeh, and these include the Palestinian camp of al-Whedat just to the south-east of the urban core.

Overall, the analysis demonstrates that the contemporary social zonation of the city of Amman shows what may be referred to as a strongly 'modern' pattern, attesting to its dynamic development during the era of the automobile. The city is principally characterised by a Hoytian north-western sector of relatively high social

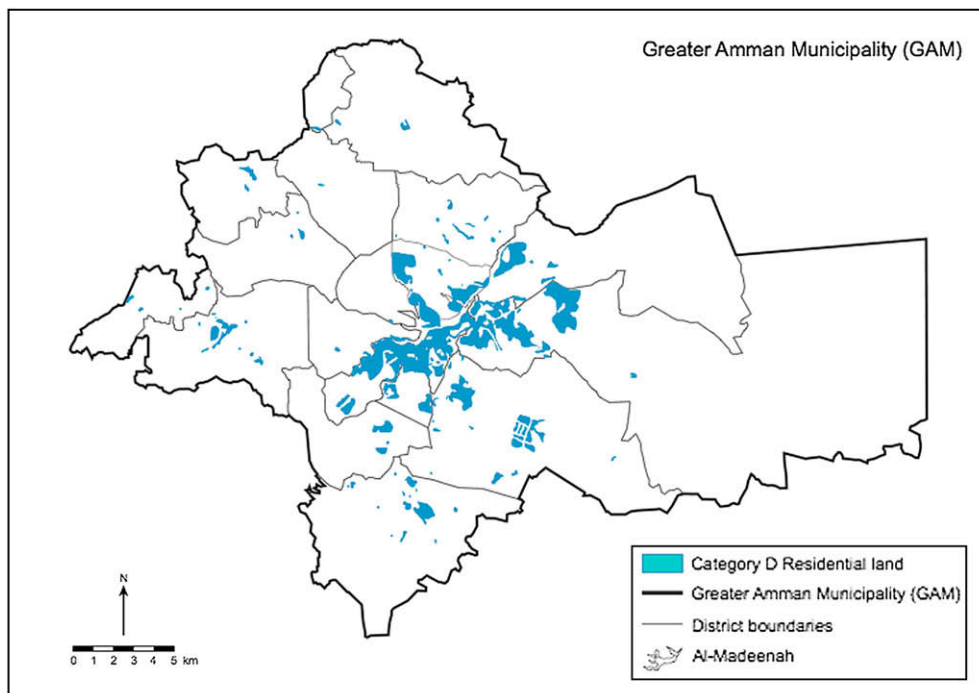


Fig. 6. 'Category D' residential land in Amman (adapted from original GIS data supplied to the authors by the GIS Department of the Greater Amman Municipality 2006).

status and land prices. At a broader level, there is a marked and well-recognised differentiation between the west and east of the city, which is best recognised when the distribution of category B residential lands is viewed (Fig. 4). But, if on the other hand, the distribution of smaller residential plots is examined in detail, a strong element of concentricity is revealed; one that in pattern, if not in terms of the details of the processes involved, is reminiscent of Burgess' (1925) concentric residential zonation.

The industrial and employment structure of the city

Notwithstanding some government efforts to decentralize economic activities, Amman remains the main economic centre of the Kingdom. Over 80% of all industrial and service activities are to be found located in the capital region of Greater Amman together with the industrial suburbs and peri-urban zone toward Zarqa and the north-east. As might be expected, general levels of prosperity and incomes are higher in the capital. According to the 2002/2003 *Household Expenditure and Income Survey* (Hashemite Kingdom of Jordan, no date) the average annual income of Ammani households was 6533 JD (1.40 JD equals £1 as of April 2008), while the national figure was 5590 JD. In comparison, the average annual income for all urban households throughout Jordan in 2002/2003 was 5751 JD, while for rural households the equivalent statistic was 4949 JD.

In terms of economic activities, the main employment categories for the Governorate of Amman in 2006 were wholesale and retail trade plus the repair of vehicles and personal and household goods, accounting for 22.3% of total employment, well above the national figure of 17.4% (Hashemite Kingdom of Jordan, 2007). The capital also shows a higher proportion of its workforce in manufacturing activities than the nation as a whole at 13.1%, as opposed to the national figure of 11.2%. The next two employment categories are slightly below the national total at 10.3% for education and 10.1% for public administration and defence. The next three employment categories, construction (7%), real estate, renting and business activities (5.8%), and other services (5.8%), are all above the national level. Amman is dominant in terms of the national tourism sector, with 75.2% of all direct employment in the sector being located in Amman. Likewise, over two-thirds of all hotel beds are to be found located in the capital. In 2006, the published unemployment level in Amman was 12.1%, as might be expected, lower than the national level of 14.0% (Kingdom of Jordan). However, female unemployment was as high as 22.5%.

In terms of the intra-urban location of jobs within the city, a number of spatial nodes stand out. These include the combined Abdali area, plus the old bus and taxi depot and the western entrance to the city with 8154 enterprises, Al-Qwaismeh (7258 enterprises), Wadi es Sir (7256), the downtown area (7095) and Tla' Ali (7019) to the north-west (Greater Amman Municipality, 2005). Once again a generalized west–east split emerges, with the western parts of the city housing the city's most modern shopping centers, universities, hotels, sports stadia and other services.

Key contemporary urban planning issues

Urban transport

If there is a single word that characterises the urban transport system of Amman it is 'congestion'. Al-Asad (2005) has lamented that since the 1990s Amman has "become a more congested city in which it is increasingly difficult to drive, and through which it is almost impossible to walk".

Reflecting its uncontrolled and uncoordinated growth, the city does not have an integrated public transport system, although the government has recently established a network of yellow city

buses. However, it is estimated that only 30% of Jordanians use public transport, and these are generally the relatively poor. As Al-Asad (2004a) observes, if people have the money they buy a car or use taxis. Thus, transport in the city is as socially polarised as the structure of the city itself. The same author argues that what is needed is an efficient bus system, using priority bus lanes. But at the present time the city is almost totally dominated by the automobile. Thus, long-established 'serveeces', or white shared taxis ply their trade on fixed routes radiating from the downtown, charging a flat fare. These are outnumbered by the near ubiquitous yellow taxis and it is estimated that around a quarter of all vehicles in Amman are taxis. Their metered fares are relatively inexpensive and around town trips generally cost little more than 1 JD.

The dominance of the automobile is also reflected in the city's network of major roads and tunnels, which grew phenomenally from the late 1960s into the 1980s, as the city expanded rapidly. This is clearly witnessed in the sequence of diagrams shown in Fig. 2. But notwithstanding such investment, the city suffers from considerable traffic congestion at peak hours, especially during the summer months when affluent vacationers from the Gulf region and Jordanian returnees flood into the city. Al-Asad (2004a) has bemoaned the fact that the city is so pedestrian unfriendly, with broken, interrupted or non-existent pavements and parking dominating all areas of the city. In 2003, 46.5% of households in Amman had a private car, compared to a figure of 35.9% for Jordan. In 2005, there were 679,700 licenced vehicles in Jordan, of which it is reported that 154,500, or 22.7% were involved in accidents. In the same year, there were 790 road casualties, amounting to over two deaths per day (Hashemite Kingdom of Jordan, 2006).

Two new urban transport projects, the Abdoun Bridge and the Amman-Zarqa light railway project witness the growing recognition of the pressing need to do something about the urban transport problem as well as at the same time supporting Greater Amman's growing role as a regional centre for trade and services. The Abdoun Bridge, located in inner-urban west Amman, was opened in December 2006 at a total reported cost of JD 10.8 million, having been undertaken by means of Japanese funding. The ultra-modern 45 m high and 425 m long bridge forms part of Amman's beltway or ring road (Photograph 4). The proposed Amman-Zarqa 28 km light track railway will extend from the centre of the city at Swaileh to the industrial suburb of Zarqa to the north-west of the city centre. The tender for the project was floated on 10 December 2006 and the project, which will cost \$140 million, will be offered on a build, operate and transfer basis. Both of these projects can be interpreted as key elements in the desire to modernise the urban fabric of Amman and bolster its regional significance.

The provision of urban water under conditions of 'water stress'

Reflecting the physical geography of the region and the rapid growth of the city itself, a major issue for Amman is the supply of potable water. In 2004, the total consumption for the city area was 105 million m³ (LEMA, 2004) and local resources are insufficient to meet this. In its *National Water Master Plan* (2004) the Government has stressed that the first priority is to meet the basic needs of the population. Indeed, as the population of the city has grown, various strategies have been implemented, most notably the transfer of waters from the Jordan Valley, from distant reservoirs and aquifers and the recycling of wastewater (Darmame, 2004; Potter, Darmame, & Nortcliff, 2007). Today, Amman receives around 50% of its water from the Jordan Valley. Water is pumped from –225 m in the Jordan Valley to a modern treatment plant at Zai, which is located to the north-west of the city at an altitude of 1035 m. The remaining water demands of the city are met from the Al-Mafraq well, the Azraq aquifer (some 70 km east of Amman), as well as from Qatrana, Swaqa and Wala to the south of the city.



Photograph 4. A section of the newly constructed Abdoun bridge at night (Photo: Rob Potter).

Unlike many cities in the developing world, 98% of households in Amman are connected to the water supply network. However, since 1987, the supply of water to households has been rationed. Up until 2004, for most parts of the city, water was supplied on just one or two days of the week, and the problem for households has been that of storage. Wealthy families have been able to invest in large underground storage tanks or cisterns, whilst less wealthy families have been dependent on the ubiquitous 2 m³ roof-top storage tank.

From the first, the rationing of the urban water supply reflected not just the relative scarcity of water, but also the deplorable physical state of the network. Until 1999, 54% of the water entering the city's distribution system was classified as "unaccounted for", with half of this being lost through leakage. This reflected the fact that over time, extensions to the network have not generally been planned and have consisted of small diameter pipes. Over the years, operators have often responded to problems of water pressure by increasing pump size rather than by reinforcing the network, thereby increasing overall pressures within the system (LEMA, 2004). The remaining 'unaccounted for water' has been due to inadequate billing, lax payment collection and the illegal use of water, which in 2004 amounted to over 30,000 instances. The water Authority of Jordan calculates that on average an illegal user of water consumes two to three times more water than a legal subscriber.

In order to meet the demand, especially in the dry summer months, various sub-markets for urban water have developed, such as private water tankers, water bottled from private wells and distilled mineral water derived from small reverse osmosis machines. In this context, household income and family size are vitally important variables. The cost of purchased water, storage tanks, pipe work and filters are prohibitive for poor households in the eastern and southern areas of Amman. This is one of the reasons for the low average domestic water consumption of 94 l per head per day in the city (GTZ & MWI, 2004). Not surprisingly, the social polarity that characterises Amman is, therefore, also reflected in patterns of water consumption within the city.

Looking to the future, providing the city with adequate water is a priority of the Government. One of the major proposals envisaged to achieve this is the Disi Project. This involves the proposed construction of a 325 km pipeline from the Disi aquifer which lies

on Jordan's border with Saudi Arabia. This would provide the city with around 100 million cubic metres per year at an estimated base capital cost of \$US 600 million.

In respect of management, Amman's water supply system was placed in the hands of the private sector in February 1999, when a four year contract was granted to ONDEO, the commercial arm of Suez Environmental, of which Lyon Water, France is a leading subsidiary. A local company known as LEMA was created, owned 75% by Suez Environmental and 25% by Arabtech Jardaneh (Jordan) and Montgomery Watson (UK). LEMA operated with an operational investment fund of \$US 25 million for urgent maintenance and repairs. The contract was extended twice and continued through to December 2006.

LEMA operated over an area of 3000 km², supplying 2 million people and managing 350,000 accounts. It is generally acknowledged that LEMA's major contribution has been in improved billing and debt collection, customers service in general, and in the regulation of rationing. For instance, in winter 2006, continuous supply was introduced to 15.8% of LEMA's customers, and it is clear that some technical sources feel that the entire system should move toward continuous supply both for technical and supply reasons. However, it seems equally clear that at the present time, Government does not feel this is a step in the right direction.

After much debate during the period 2005–2006, the era of privatisation came to an end in January 2007, with management of Amman's water being placed in the hands of a new 'public company' *Me Yehonna* ('Our Water'). This is owned by the Water Authority of Jordan (WAJ), but will be run on the lines of a private company. This is exactly the model that has been in operation in the second city Aqaba since 2004 and is being presented by the Ministry of Water and Irrigation as a crucial alternative to private sector involvement in the water sector in Jordan. In this sense, sources in the Ministry stress that while the water system of Amman is no longer privatised, it will remain commercialised.

Planning the development of Amman

Contemporary physical development planning for Amman commenced in 1938 when the then British Mayor proposed a land use plan for the city (Kadhim & Rajjal, 1988; see also Malkawi &

Adu-Dayyeh, 2004; Malkawi, 1996). But the most comprehensive plan came with Amman Municipality's *Greater Amman Comprehensive Development Plan 1985–2005* (GACDP), which was funded by the United States Agency for International Development (USAID) (Amman Municipality, 1987; see also Abu-Dayyeh, 2004). The aim of the Plan was to control and shape the growth of the city in order to accommodate an estimated population of 2 million by 2005, the level now reached.

Abu-Dayyeh (2004a) argues that the plan's recommendations were based on the British planning ideology, focussing in particular on the prevention of peri-urban and suburban growth, the establishment of Green Belts and the channelling of new growth into satellite towns. In setting out the preferred settlement pattern for Greater Amman for the year 2005, the intention of the Plan was to develop two satellite towns to the south and east of the Greater Amman urban region; one, a limited satellite located to the immediate south of Queen Alia Airport, and the second, a more extensive area lying to the south-east of the city on the Ring Road joining Zarqa to Queen Alia Airport, as shown in Fig. 7.

Such intentions are now referred to as the *Amman Development Corridor Project (ADCP)*, which has the status of a priority operation presented by the Government of Jordan for World Bank assistance as part of its Country Assistance Strategy. The intention is to develop the south-east section of the planned Amman Ring Road as an industrial development corridor. This will link the Zarqa industrial area to the north-east of Amman with the Desert Highway to the south of Amman, along which lies the Queen Alia International Airport. This expressway continues southwards to the Aqaba Special Economic Zone (ASEZA), and sole port for the nation.

The proposal for the Amman Development Corridor has to be seen as linking to the wider objective within the Kingdom as a whole, namely to decentralize away from the capital. With 80% of the economic activity and 70% of the population, it is clear that much needs to be achieved in decentralising away from Greater Amman (Al-Asad, 2005). The details for the Amman Development Corridor puts the combined population of Amman and Zarqa at over 50% of the national total and as accounting for over 80% of the nation's industrial sector. At the national level, the other direction of expansion is toward Irbid to the north. However, as a concomitant of this, urban sprawl is occurring along the highways, noticeably toward the airport (Al-Asad, 2005) and toward Salt and Madaba (see Figs. 1, 2 and 7).

Recently, successive increases in fuel and electricity prices, linked to globally rising energy costs, have had a negative impact on the Jordanian economy. The prices of goods and services have increased significantly after the government stopped its subsidies for oil, and consumers now have to meet the full cost of such increases. This situation has also started to affect the range of urban projects planned by the Municipality of Amman. This means that additional costs now need to be met in order to achieve given outcomes. The Government of Jordan aims to make the capital a major focus for trade, investment and cultural activities. Furthermore, the capital has been attracting huge investments, partly due to the fact that the large capital surplus of the Gulf oil-producing countries has since September 2001 been diverted from western countries to the Middle East. In order to respond to these contemporary challenges, the Municipality of Amman has established a *Master Plan* to channel increasing investments into the city.

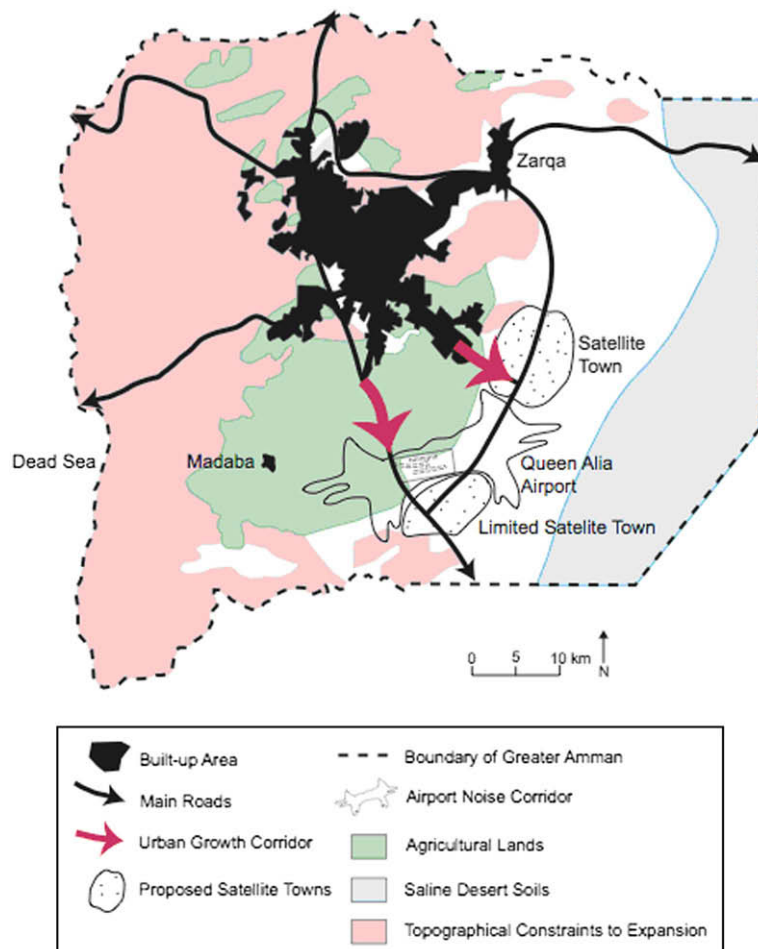


Fig. 7. Planned regional settlement pattern for Amman, including the Amman Development Corridor (adapted from Amman Municipality, 1987).

Two phases of the plan have already been approved and the third phase is due to be approved in May 2008. In addition, the Municipality of Amman has taken such developments into consideration in revising its *Strategy for 2005–2009*, which is updated each year, taking into account risks, such as further increases in the price of oil. However, it seems all too likely that the net outcome of such increasing costs and associated constraints will be the exacerbation of social polarisation within the Greater Amman urban area.

Conclusion: the growing geopolitical importance of AMMAN in the 21st century

The state of Jordan is playing an increasingly pivotal role both in the Middle East region and on the world stage, as part of the new geopolitical order born of the invasion of Iraq and the 'Second Gulf War'. On the one hand, the state of Jordan has traditionally followed a pro-western foreign policy and has maintained close relations with both the United States of America and the United Kingdom. On the other hand, Jordan's peaceful and non-confrontational approach in respect of its neighbours, in combination with its overall stability, means that it has acted as a magnet for Palestinians, Lebanese, Iraqis and indeed, those from all parts of the Middle East who are looking for a new 'home'. Both of these important geopolitical policy strands were exemplified by the fact that on ascending to power in February 1999, following the death of his father King Hussein, King Abdullah II moved swiftly to reaffirm both Jordan's peace treaty with Israel and its history of close relations with the United States.

Reflecting these strategic realities, as the capital of the Kingdom, the geopolitical and symbolic significance of Amman is increasing. Writing of the recent history of Amman, Al-Asad (2004b), a local journalist and urbanist, has recorded how:

"It became a sort of 'lung' that has provided much needed breathing space for populations in the region suffering from political displacement – Palestinians since 1948, Lebanese and Iraqis since 1990".

So that today, Amman "is playing an increasingly important role in the life of the region" (Al-Asad, 2004b). This increasing regional and geopolitical importance is reflected in the continuing rapid growth of the city and a number of urban redevelopment projects which are ongoing, some of which, such as the Amman light railway, the Abdoun Bridge and Amman Development Corridor, have been reviewed in this paper.

Less positively, however, Jordan's key contemporary strategic geopolitical position has recently made it vulnerable to terrorist attacks, most notably on 9 November 2005 when suicide bombers simultaneously attacked three major central Amman hotels. In these bombings, 57 people were killed and 115 were injured. 'Al-Qaeda in Iraq' claimed responsibility for these bombings, led by the now-deceased Jordanian national Abu Musab al-Zarqawi. In a further incident in Amman, on 4 September 2006, a lone gunman shot at a group of escorted tourists at the Roman Amphitheatre, killing a British man and wounding five other people. Reflecting the strategic vulnerability of Amman and Jordan, notably, in November 2005, following the three suicide bombs, King Abdullah II called for a "war on extremism". At the start of the 21st century, it is clear that as well as fulfilling its promise as a primarily modern Arab

metropolis, Amman increasingly stands at the contemporary geopolitical heart of the Middle East region.

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