

## **Higher Densities No Sprawl: Master Plan for the City of Ramat-Gan, Israel**

### **Israel is a small and densed country.**

Israel is a small country with a total area of 21,000 sq.km. and population of 7.2 million people (Central Bureau of Statistics, 2007). It is a densed country (340 people per sq.km.), similar to the Netherlands, Lebanon, Belgium, India, Japan and South Korea, and high relatively to world's average (60) or China (140) or USA (30).

There are only 5 cities with more than 200,000 people (26% of the population), 19 cities with population of 50,000-200,000 (28%), and 202 cities, towns and townships with 2,000-50,000 people (38%). The rest of the population (8%) lives in 938 rural settlements. A survey that has been completed lately (Kaplan, M. et al) shows that urban settlements require 70% of the total built area in Israel, while rural settlements require the rest (30%).

The average gross density in urban areas is 7,700 ppsq.km. but if we separate the small townships we find that 75% of the population in Israel requires 50% of the total built area in average density of 10,000 ppsq.km.

The main reason for the difference between high national density and comparatively low urban density is the large number of rural and small towns scattered all over the country and the small part of population in cities larger than 200,000 people. This also suggests high differences in densities of urban settlements (28,500 ppsk.km.) and rural settlements (500 ppsq.km.).

### **Tel-Aviv region is smaller and denser.**

Israel is divided into 6 regions. Tel-Aviv region is the smallest (171 sq.km.) and the denser of all (1.17 million people). The majority of economic activity takes place in this region, which causes a large number of commuters from other parts of the country. The total built area in this region is 111 sq.km. (65% of its area), of which 101 sq.km are residential and 7.6 sq.km. commercial. The gross population density is 6,900 ppsq.km. and the net density in residential areas is 18,000 ppsq.km. Among the cities in the Tel-Aviv Region there are substantial differences of densities, as can be seen in Table 1.

The relationship between the gross and net densities implies few facts about the city: the proportion between the built area of the city and its total area, and the proportion between residential area and the total area of the city. For example, cities which have developed already most of their area and are primarily residential will have an index closer to 1.

Table 1. Gross and net densities in Tel-Aviv Region (ppsq.km.)

| City           | Population | Total Area (sq.km) | Residential Area (sq.km) | Gross density (ppsq.km)* | Net density (ppsq/km)** |
|----------------|------------|--------------------|--------------------------|--------------------------|-------------------------|
| A              | B          | C                  | D                        | E                        | F                       |
| Or-Yehuda      | 31,300     | 5.141              | 1.722                    | 6,088                    | 18,177                  |
| Azur           | 10,200     | 2.415              | 1.025                    | 4,224                    | 9,951                   |
| Efal           | 4,100      | 4.97               | 1.086                    | 825                      | 3,775                   |
| Bnei-Brak      | 147,900    | 7.343              | 3.596                    | 20,142                   | 41,129                  |
| Bat-Yam        | 129,400    | 8.167              | 3.935                    | 15,844                   | 32,884                  |
| Givataim       | 49,400     | 3.246              | 2.458                    | 15,219                   | 20,098                  |
| Herzelia       | 84,100     | 21.585             | 8.961                    | 3,896                    | 9,385                   |
| Holon          | 167,100    | 18.927             | 7.061                    | 8,829                    | 23,665                  |
| Ramat-Gan      | 129,700    | 13.229             | 8.288                    | 9,804                    | 15,649                  |
| Ramat-Hasharon | 36,800     | 16.792             | 4.838                    | 2,192                    | 7,606                   |
| Tel-Aviv       | 384,400    | 51.788             | 22.311                   | 7,423                    | 17,229                  |
| Total          | 1,174,400  | 153.603***         | 65.281                   | 6,870                    | 17,990                  |

(Central Bureau of Statistics. 2007)

\* B divided by C

\*\* B divided by D

\*\*\* additional 17.4 sq.km of regional area

### **National and regional plans, Policy papers encourage regeneration and densification.**

Unlike many other developed countries, two major phenomena affect Israel's development, which also have an impact on both population distribution and residential density:

- Significant population growth (1.8% in 2006, CBS 2007) and large average household (3.4). CBS forecast suggests population of about 9 million people in 2020.
- Significant growth in standards of living, will cause growth in the total built area per person: it has been suggested (Mazor, A. et al) that the total built-up area per person, both for residential and other uses (commercial, sports, public etc.) will grow from 38 sq.m. (1990) to 68 sq.m. (2020) pp.

National Plan No. 35 (Asif, S., Shahar, A. 2005), emphasized the need to protect open spaces outside built areas and suggested the densification of cities and other settlements. The new borders of urban areas have been defined in maps and minimal net dwelling densities for every type of settlement have been set: for Ramat-Gan or Tel-Aviv a minimum of 110-120 dwelling units per hectare, and for rural settlements a minimum of 25.

### **How do we measure densities?**

The Israeli Planning and Building Law (1965) requires "to determine guidelines concerning the allowed building density" (article 63(5) for a local plan) and "to determine guidelines concerning the number of buildings on a lot, the number of apartments in each building, and the number of rooms in every building or apartment" (article 69(11) for a detailed plan). Practically, the most popular index for measuring density in Israel, is the net dwelling density, which refers to number of dwelling units per residential area.

There are many common ways to measure density of population, dwelling, or overcrowding. When we compare the population of the city to its total area we have a good idea of how well

we utilize the land, but we do not know more about the nature of residential areas of this city: is the population of the city spread equally all over its area in low-rise houses, or is it concentrated in a small area of residential towers? What is the nature of the rest of the area of the city?

### **How dense is dense?**

Density is a matter of geography. In US cities, gross density of 3,000 ppsq.km. are common. The densities in Barcelona or Paris are considered the highest in Europe and reach 16,000-20,000 respectively. Cities like Hong-Kong or Singapore have lower gross densities but much higher net residential densities, because of their large open spaces and other land uses. Both last cities have a large amount of residential towers built in very high FAR, relatively to other cities.

Net dwelling densities can vary from one city to the other: In Hong-Kong, average DSA density is 120-950 dwelling units per hectare, in the metroplan area. In Tel-Aviv and Ramat-Gan city centers, net density reaches 200 units per hectare.

Mercer publishes every year the list of 50 cities with best quality of living (see appendix 1). Is there any relationship between high densities and quality of living? Not according to the Mercer list: more than 50% of the cities have density lower than 3,000 ppsq.km. and only 4 cities above 10,000 ppsq.km (at the second place, 33th, 41th and 43th).

### **Are there limits to density?**

The majority of planners admit that high densities support urban activities. These contribute to urban infrastructure, services, transportation etc. There is of course the danger of overcrowding which can contribute to congestion, pollution etc. Also, there are certain parameters that should be checked before making a decision:

#### ***Public uses:***

In Israel, there are norms considering public uses: open spaces (parks, gardens etc) public buildings (schools, community centers etc) and roads. Some of these are measured as sq.m. per person (5 sq.m.pp for local open space, and 5 sq.m.pp for district open space) and some relate to level of service with thresholds for various buildings (e.g., 1 school per 4,000 people etc). Space required for roads depends primarily on the actual design, and on the average size of lot. Generally, total area of 20 sq.m.pp, can be considered as norm for all public needs.(these are not incorporated as part of planning law or regulations).

#### ***Building Height:***

Does higher densities result higher buildings? This has not been proven both theoretically and practically.

According to the above norms, and the Israeli Planning and Building Law which allows only 40% compulsory purchase, a plan for 19,000 ppsq.km. is the most dense before reducing norms. If higher proportion of land can be condemned (according to another planning process), density can be raised to 30,000 ppsq.km. (Boneh, M. Friedmann, R.): this will reduce the net residential area by 33%, enlarge the total area for public uses by 38% and change average building height from 4 storeys to 16. The total area for public uses will be 65% of the total area: this will have a substantial impact on the appearance of the built environment.

For many years, cities like Ramat-Gan approved plans that had gross dwelling densities of 60 units per hectare and net dwelling density of 10 units per hectare. In these plans average building height was 5-8 storeys. In some cases, mainly with small plans ("spot-zoning"), building height reached 16 and more storeys and gross and net densities were higher.

**Urban Tissue:**

The traditional urban structure of many cities in Israel, including Ramat-Gan, is based on privately-owned small parcels (500 sq.m and less) along narrow streets of 8-12 metres wide. The buildings are situated almost in the center of the Parcel, leaving space around them ("building lines") normally 4.0 meters to the front, 3.0 to the sides and 5.0 to the back. This suggests, for example, good natural ventilation and light to many rooms, including bathrooms and kitchens, but poor visual- and audio-privacy (due to short distances to neighbour buildings).

When discussing higher densities for Israeli cities, the urban structure of cities like Paris, Barcelona or Berlin is suggested as an alternative to high-rise high-density tissue, however this may require a significant change in customers habits, and also in the traditional parcel structure.

**The city of Ramat-Gan**

The city of Ramat-Gan, established in 1926, has an area of 13.5 sq.km. with population of 136,000 people. The majority of its area (63%) is for residential use and the rest for open spaces (17%), public buildings (7%), commercial (3%) etc. The total number of dwelling units is 57,000. The majority of buildings are 3-4 storeys high. During the last years, there are substantial amount of residential towers (30 storey and more) under construction. Most of Ramat-Gan municipal area (97%) has already been developed.

The average districts of the city, as can be seen in Plan 1, have densities described in Table 2:

Plan 1. Districts of Ramat-Gan

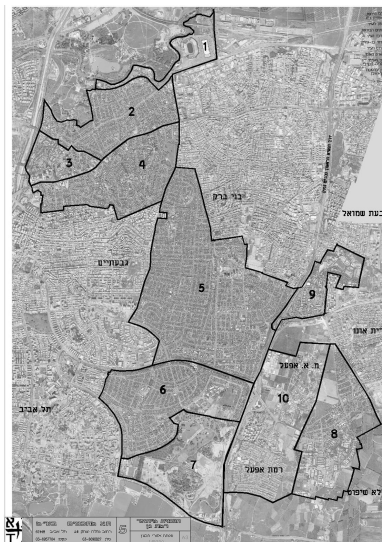


Table 2. Districts of Ramat-Gan

| District | Population |          | Area<br>(sq.km<br>) | ppsq.km  |          | DU per hectare |          |
|----------|------------|----------|---------------------|----------|----------|----------------|----------|
|          | existing   | forecast |                     | existing | forecast | existing       | forecast |
| 2        | 24,095     |          | 1.273               | 18,930   | 20,290   | 120            | 130      |
| 4        | 32,884     |          | 1.483               | 22,170   | 25,130   | 160            | 190      |
| 5        | 63,349     |          | 3.930               | 16,120   | 18,230   | 120            | 140      |
| 6        | 12,261     |          | 1.866               | 6,570    | 8,480    | 50             | 60       |
| 8        | 928        |          | 1.602               | 1,520    | 4,220    | 20             | 30       |
| Total    | 133,517    |          | 10.154              | 10,300   | 12,100   | 100            | 130      |

### Master Plan for the city of Ramat-Gan

In 2007 the city of Ramat-Gan has started to prepare its new master plan. This is in accordance with a comprehensive reform in the Planning and Building Law made by the government, which, among other issues, transforms planning powers from the central government to the local authorities.

One of the key targets of this plan is to create urban regeneration processes, which will lead, among other processes, to densification of the built environment. According to assessments made by the planning team, in order to reach the goal of 160,000 inhabitants in 2020, and to improve overcrowding density from 31 sq.m.pp to 39 sq.m.pp, an annual addition of 920 new dwelling units is required.

The plan has adopted few principles to enable this goal:

- Buildings 2-3 storeys high can be replaced by new 9 storeys buildings, at a net density of about 300 DU per hectare. This will provide a potential stock of 21,000 dwelling units, of which 5,500 will be constructed until 2020.
- The economic abilities of the population of Ramat-Gan and others has shown that the potential for dwelling units in residential towers reaches about 250 per year. The plan has suggested that 25% of the total amount of new planned dwellings will be in towers above 18 storeys.
- A light-rail is under construction at the north part of the city, leading to the central business district of Tel-Aviv. The plan suggests that at a walking distance of 500 meters from 3 train stations, densities can be higher than average.

Since the plan deals with built urban areas, the planning team has looked into the issue of additional annual dwelling units (920 per year) compared to the overall building stock that is needed to obtain it. It has been assumed that because of complexed processes due to multi-ownership in each parcel, the rate of realization will be very low (around 2% of the stock a year) and will last for 20-25 years, at the most. This has led the planning team to suggest a total building stock of 42,000 DU, a stock that has to be renewed all the time.

If this forecast will be realized as planned, and the population of Ramat-Gan will grow from 136,000 to 160,000 in 2020, the gross population density will grow from 10,000 ppsq.km to 12,000 ppsq.km. In the more crowded areas of the city, such as city-center, density will grow from 22,000 ppsq.km to 25,000 ppsq.km, and in less densified areas from 16,000 ppsq.km to 18,000 ppsq.km. In order to comply with public spaces norms, the Ramat-Gan Master Plan requires also the approval of 7.1 hectare of open spaces and 12.6 hectares for public buildings.

## **Bibliography**

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4. Asif, S., Shahr, A. (2005) *National Plan for Israel No. 35*, Ministry of Interior, Jerusalem.
5. Mercer, Quality of Living Survey 2007.
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**Appendix 1: The Mercer Quality of Living Survey 2007 with population densities**

| City              | Country         | Rank | Population | Area (sq.km) | Density (ppsq.km) |
|-------------------|-----------------|------|------------|--------------|-------------------|
| ZURICH            | Switzerland     | 1    | 380,000    | 92           | 4,130             |
| GENEVA            | Switzerland     | 2    | 184,000    | 16           | 11,500            |
| VANCOUVER         | Canada          | 3    | 590,000    | 115          | 5,130             |
| VIENNA            | Austria         | 4    | 1,650,000  | 415          | 3,976             |
| AUCKLAND          | New Zealand     | 5    | 405,000    | 246          | 1,646             |
| DUSSELDORF        | Germany         | 6    | 580,000    | 217          | 2,673             |
| FRANKFURT         | Germany         | 7    | 670,000    | 248          | 2,702             |
| MUNICH            | Germany         | 8    | 1,500,000  | 310          | 4,839             |
| BERN              | Switzerland     | 9    | 130,000    | 52           | 2,500             |
| SYDNEY            | Australia       | 10   | 4,200,000  | 1,687        | 2,490             |
| COPENHAGEN        | Denmark         | 11   | 500,000    | 88           | 5,682             |
| WELLINGTON        | New Zealand     | 12   | 180,000    | 290          | 621               |
| AMSTERDAM         | The Netherlands | 13   | 740,000    | 202          | 3,663             |
| BRUSSELS          | Belgium         | 14   | 1,000,000  | 162          | 6,173             |
| TORONTO           | Canada          | 15   | 2,500,000  | 1644         | 1,521             |
| BERLIN            | Germany         | 16   | 3,400,000  | 892          | 3,812             |
| MELBOURNE         | Australia       | 17   | 3,700,000  | 1,700        | 2,176             |
| LUXEMBOURG        | Luxembourg      | 18   | 77,000     | 51           | 1,510             |
| OTTAWA            | Canada          | 19   | 810,000    | 2778         | 292               |
| STOCKHOLM         | Sweden          | 20   | 800,000    | 190          | 4,211             |
| PERTH             | Australia       | 21   | 1,550,000  | 5,386        | 288               |
| MONTREAL          | Canada          | 22   | 1,600,000  | 500          | 3,200             |
| NURNBERG          | Germany         | 23   | 500,000    | 186          | 2,688             |
| CALGARY           | Canada          | 24   | 1,000,000  | 721          | 1,387             |
| HAMBURG           | Germany         | 25   | 1,700,000  | 755          | 2,252             |
| OSLO              | Norway          | 26   | 560,000    | 454          | 1,233             |
| DUBLIN            | Ireland         | 27   | 500,000    | 115          | 4,348             |
| HONOLULU, HI      | United States   | 28   | 390,000    | 272          | 1,434             |
| SAN FRANCISCO, CA | United States   | 29   | 750,000    | 120          | 6,250             |
| ADELAIDE          | Australia       | 30   | 1,100,000  | 870          | 1,264             |
| HELSINKI          | Finland         | 31   | 570,000    | 190          | 3,000             |
| BRISBANE          | Australia       | 32   | 1,800,000  | 5805         | 310               |
| PARIS             | France          | 33   | 2,200,000  | 105          | 20,952            |
| SINGAPORE         | Singapore       | 34   | 4,500,000  | 693          | 6,494             |
| TOKYO             | Japan           | 35   | 12,000,000 | 2190         | 5,479             |
| LYON              | France          | 36   | 1,200,000  | 490          | 2,449             |
| BOSTON, MA        | United States   | 37   | 600,000    | 232          | 2,586             |
| YOKOHAMA          | Japan           | 38   | 3,500,000  | 437          | 8,009             |
| LONDON            | UK              | 39   | 7,500,000  | 1579         | 4,750             |
| KOBE              | Japan           | 40   | 1,550,000  | 553          | 2,803             |
| BARCELONA         | Spain           | 41   | 1,500,000  | 100          | 15,000            |
| MADRID            | Spain           | 42   | 3,000,000  | 605          | 4,959             |
| OSAKA             | Japan           | 43   | 2,700,000  | 228          | 11,842            |
| WASHINGTON, DC    | United States   | 44   | 590,000    | 177          | 3,333             |
| CHICAGO, IL       | United States   | 45   | 3,000,000  | 606          | 4,950             |
| PORTLAND, OR      | United States   | 46   | 560,000    | 348          | 1,609             |
| LISBON            | Portugal        | 47   | 570,000    | 85           | 6,706             |
| NEW YORK CITY, NY | United States   | 48   | 8,200,000  | 1214         | 6,755             |
| MILAN             | Italy           | 49   | 1,200,000  | 181          | 6,630             |
| SEATTLE, WA       | United States   | 50   | 580,000    | 369          | 1,572             |