

The Jerusalem Institute for Israel Studies
The Center for Environmental Policy

Urban Environmental Quality

Editor: **Israel Kimhi**

2005

The Center for Environmental Policy Studies Series #12

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This publication was made possible by funds granted by
the Reuben and Edith Hecht Trust
and the Charles H. Revson Foundation

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URBAN ENVIRONMENTAL QUALITY — A SUMMARY

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The State of Israel is one of the most urbanized and densely built countries in the world. More than 90% of its residents live in urban localities. Nonetheless, spreading construction, both urban and rural, coupled with projections for continued rapid population growth relative to any other Western nation, raise the fear that Israel will run out of open spaces, particularly in the country's center. Therefore, Israel's planning policy has changed substantially in the last decade. Instead of encouraging the population to spread out in open spaces, it has set as a principal national objective the concentration of future development in or adjacent to existing built-up areas, particularly in the cities.

Although it could be argued that the process of densifying urban areas is helpful in preserving the open spaces outside the metropolitan areas, it is liable, at the same time, to exacerbate the damage within the cities. As a result of built densities, hazards such as noise and air pollution are likely to increase, since many of these problems are caused by transportation. Higher urban densities are also liable to damage open spaces within the cities, as well as the quality of life in over-crowded residential neighborhoods. In the event that the urban quality of life does, indeed, deteriorate because of the process of intensifying densities, the attractiveness of the suburbs and pressure on the population to leave the cities will rise. Thus, if we truly wish to avoid the continued process of suburbanization and damage to the open space outside the cities, we must ensure that higher densities are effected in such a way that does not jeopardize urban quality of life. Moreover, the success of any efforts to achieve higher urban densities depends, to a large extent, on improving the quality of life in the cities, among other things, by improving the environment within these centers.

In order to address the question of how we can increase residential densities in Israel's cities while still maintaining their quality of life — and even improve on it — the Jerusalem Institute for Israel Studies convened a special task team. The goal of this team is two-fold: first, to promote awareness of the importance and centrality of questions concerning intra-urban quality of life, both among planners

and the population at large; and second, to propose practical measures for improving urban environmental quality, even during the process of increasing urban densities, and to encourage a comprehensive and multi-systemic perspective towards environmental issues in the city. The team's findings comprise this book. The team focused its work primarily on physical domains (transportation, noise and air pollution, urban densities, the city's visual appearance, and the like). These topics were chosen because of their great impact on the quality of life in cities, and the health of their residents. The task team also discussed the issue of involving the public in the planning processes, believing this to be of great importance and to influence the quality of life in the city. This book does not discuss other issues, despite their tremendous environmental impact, such as energy savings, collecting and removing solid waste, or water quality and sewage treatment. The significance of these issues in the Israeli context is reflected primarily at the super-urban level (either regional or national), and is less an issue in the intra-urban context, which is the focus of the present document.

Of course, urban quality of life is not composed solely of physical parameters. No less important are the social parameters, including reduction of economic disparities, educational level, citizens' rights, social justice, and so on. Undoubtedly, these aspects must be discussed in the future as well. But in this first publication the emphasis is on the quality of the intra-urban environment.

This abstract outlines the principal recommendations in the domains examined by the team: transportation, noise, air quality, the relationship between population density and open spaces and the quality of life in residential neighborhoods, esthetics within the city, and environmental evaluation systems for buildings and the urban area. These recommendations are based on an exhaustive analysis of each one of these questions, which are presented at length in Hebrew in the various chapters of the book.

The Transportation Factor

As stated previously, one of the main factors that define urban environmental quality is transportation, which impinges upon an extensive array of environmental parameters. Transportation also affects urban quality of life because of the type of accessibility it allows.

Private cars are the most important means of urban transportation, though not the only one. In fact, a major focus of urban transportation policy efforts is directed towards balancing the use of private vehicles with that of other types of transportation, that is, public and non-motorized transportation.

Given the many hazards caused by transportation, the numerous goals of environmental-transportation policies, and the many modes of transportation, it is necessary to combine these different modes, in both policy and application, and create policy “packages.” Thus it becomes possible to cope with the environmental problems caused by transportation much more successfully and more comprehensively than by adopting a partial perspective or by using isolated means. In reality, in order to achieve the desired effect — reducing the variety of hazards, providing good access to all population groups, and increasing the proportion of public transportation and non-motorized transport in the types of traffic — it is necessary to combine a great many modes of transportation so that they complement one another. This requires precise planning that integrates transportation planning with specific design for access to public transportation stations, the stations themselves and pedestrian and bicycle paths; as well as urban planning that allows for mixed land use and population densities that support and encourage the use of public transportation.

To put it more concretely, it is recommended that plans be prepared that will define traffic cells, where noise-abatement measures can be used and along which public transportation lines can run. A high level of service must be provided to all market segments, while reducing emission factors. This type of reduction is achieved mainly by replacing the fuels used by the primary means of public transportation — buses. This is possible for a large and specialized fleet of vehicles, operated as a closed system. In order to encourage the use of public transportation, it is necessary to plan and produce attractive access to public transportation centers, particularly for pedestrians and bicycle-riders, in addition to “park and ride” lots near train stations located in more distant suburbs.

This type of strategic planning and its implementation require changes in the urban and transportation planning methods currently employed in Israel. To date, transportation planning is an offshoot of urban planning, and is focused on motorized transport; but in the future, transportation planning will have to become the focus for urban planning. Transportation planning must emphasize pedestrians

and public transportation users, rather than motorized transportation (even though motorized transport will continue to be the primary means for mobility within the metropolitan space). In other words, the non-motorized and public transportation system must become the starting point for comprehensive urban planning.

This is a substantive change in Israel's planning practices, compared with the past 50 years, and not all the facts have been assembled in order to fully implement it. It is necessary, therefore, to take several steps that will serve as a basis for the new practices:

- ❖ To research the effect of parking standards on the appearance of neighborhoods, the behavior of car-owners, and the attractiveness of areas to different types of businesses;
- ❖ To sample neighborhood planning for public transportation and walking paths under different conditions in Israel;
- ❖ To prepare design guidelines and programs for public transportation centers;
- ❖ To analyze the impact of mixed land uses on traffic patterns; and
- ❖ To characterize service levels with regard to public transportation and walking.

For each of these issues, we must examine international experience and investigate or research the situation in Israel. Obviously, these are preliminary proposals, but they are necessary to prepare the tools needed to implement an approach that places non-motorized and public transportation at the center of urban planning.

The direct environmental impact made by transportation on urban environmental quality is noted in two important parameters: the noise caused by vehicular traffic and air pollution as a result of exhaust emissions from vehicles.

Noise in the Urban Space

Noise hazards are one of the most prominent and influential factors affecting the quality of life of city residents and urban environmental quality. The main sources of noise include:

- ❖ Transportation infrastructures (ground and air);

- ❖ Specific sources, such as events in open spaces, land uses that attract large crowds of people, centers of industry, employment and commerce, and sources related to high-density areas;
- ❖ Various activities that take place at night; and
- ❖ Sources of noise related to the activities of the municipal authority.

Israel's statutory system includes a series of laws and regulations on the national level and on the local level (by-laws) with a view towards reducing the force of the noise. In addition, planning systems have various criteria for mitigating planning conflicts between noise-producing uses and sensitive uses that are liable to suffer from noise hazards.

Methods for reducing and preventing noise include dealing with the source of the noise, the environment in which the source of the noise is located, and the sensitive land use that must be protected from loud noise.

Below are several ways to reduce noise, according to its source:

Transportation infrastructures

- ❖ Gradually replacing noisy technologies with improved, quieter technologies;
- ❖ Encouraging the use of public transportation;
- ❖ Wisely choosing public transportation lanes (PTL), intersections where traffic can be separated on different levels, etc.;
- ❖ Reducing the volume of traffic; and
- ❖ Proper planning of sensitive buildings.

Specific sources

- ❖ Reducing noise from open spaces by setting rules for how they should be used, particularly with regard to sound amplification systems;
- ❖ Implementing solutions in planning specific uses that produce noise;
- ❖ Education and publicity campaigns; and

- ❖ Encouraging the use of improved, quieter technologies (“carrot and stick” approach).

Nighttime noise hazards

- ❖ Reducing the areas and sites where nighttime activity is permitted;
- ❖ Restricting permits for nighttime activities to streets that have no residential buildings, and preventing these activities from spilling over the seam between non-sensitive areas and residential areas; and
- ❖ Implementing licensing requirements for any business that is active at night.

Air Pollution in the Urban Space

Sources of air pollution can be divided into two types:

- A. Stationary sources; and
- B. Mobile sources (transportation infrastructures).

In the urban space, cars are the primary source of air pollution.

Stationary sources include power plants, manufacturing plants, high-tech businesses, hotels, hospitals, eateries — where the main exposure is to odors, etc.

Mobile sources include vehicles powered by gasoline and diesel engines, diesel-powered trains, and aircraft.

The information we have today regarding air pollution in Israel’s cities is based on monitoring stations scattered throughout the country (about 130 permanent stations). According to data from readings conducted by these stations, it emerges that the concentration of nitrogen oxides are particularly high. High concentrations of sulfur dioxide are found only near power plants and large industrial zones. High concentrations of ozone are usually found in the more interior regions of the country.

Current standards in Israel include “environmental standards,” which define maximum concentrations permitted in the environment, and “emissions standards,” which define maximum concentrations permitted for emissions by the source itself.

Ways to reduce air pollutants at the national and urban levels:

At the national level

- ❖ Improve fuels that are used by vehicles and industry; and
- ❖ Install technological means to reduce pollution emitted from various sources (cars, chimneys, etc.);

At the urban level

- ❖ Encourage the use of public transportation;
- ❖ Gradually replace polluting technologies with cleaner technologies;
- ❖ Increase enforcement against sources of pollution; and
- ❖ Encourage “green” initiatives as part of urban building plans, and activities by the local authority.

A city’s transportation activity, including that of public transportation, and the resulting environmental effects, are influenced to a large extent by the city’s physical structure, the system of land use, the population distribution, and the building density within the built urban fabric. Population and built density, and the relationships between open and built-up areas, have a tremendous impact on urban environmental quality. The outcomes are most obvious with regard to the measurable parameters mentioned previously, such as traffic volume, noise and air pollution. It is more difficult to define such effects in social-psychological spheres, in other words, the residents’ perception of the quality of the environment in their city. Built density is a measurable parameter (number of housing units per given area) and can be compared in different parts of the city, but residents’ feelings about built densities are subjective and cannot be quantified. A person can live in Manhattan and feel comfortable with the environmental quality, while someone else may live in a sparsely populated area and feel that the environmental quality is poor. Israel’s size, and its level of urban and rural development, require that it save on land and increase residential density wherever possible. Such a policy is also rooted in national and district planning. The question that arise from adopting such a policy pertain to the quality of the environment. How dense can the

population become before the environment and quality of life are jeopardized? We will try to answer such a question below.

Built Density, Open Spaces and Environmental Quality in Residential Neighborhoods

There is a tendency, as stated above, to increase built density in urban areas. This assumption derives from the lack of space in Israel, which is apparent not only with regard to open spaces left vacant, but also — and primarily — regarding the manner in which the built-up area is spreading. The physical basis for a policy of sustainable development of land resources allocates future additional construction to built-up areas that already exist. Therefore, it is important to discuss the impact of intensifying residential densities in urban areas on the various populations and different areas of the city's physical quality.

Raising built densities for residential purposes serves several goals. The most important of these touch on the desire to maintain the remaining open spaces and natural resources, and to save energy in order to preserve environmental quality. The social goals focus on enhancing social relationships and sense of community.

Generally speaking, the consequences of moderate and high built densities (net value: 8-20 units per dunam of land) are likely to benefit residents. These advantages are expressed as the ability to provide a variety of resources and opportunities with respect to housing, services and employment. In these types of densities, we find a relatively large number of services and jobs within walking distance from home, as well as an accessible, convenient, efficient and inexpensive public transportation system. On the other hand, the possible disadvantages of high built densities are manifested as noise, air pollution, unpleasant crowding on streets and other public services, unwanted anonymity, and a lack of open spaces. A survey of the literature also demonstrates that high residential densities can be achieved through proper physical planning, and that there is not necessarily a direct correlation between high residential density and very tall buildings.

Many studies have been conducted in recent years to examine whether increasing density via high-rise construction requires an increase in extensive open spaces, and if so, under what conditions would this be a preferred solution.

One of the conclusions of these studies points to the difficulty in integrating high-rise construction in an existing urban area, and it is not at all clear whether the advantages of high-rise construction would outweigh the disadvantages.

The proposed policy states that we should not rely on a comprehensive-qualitative specification of the number of units per given area as the sole index for measuring urban crowding. In order to define the desired level of construction density, we need to look at each region separately, within a specific framework of considerations regarding the quality of the place and the outcomes of overcrowding:

First, we must define the characteristics (both physical and social) of the neighborhood; second, we must use our judgment while examining the proposed densities, in light of environmental parameters. For the purpose of carrying out the first step, two matrices have been proposed that examine the relationship between density and several parameters that determine the characteristics of the location quality. The first, the “Applied Spatial Matrix,” refers to the following parameters: size of the city; topographical and climatic location; character of the city (a historic-ancient city with an ancient city in its center, compared with a new city that was built after the establishment of the State); the inner city or the outer city.

The second matrix is based on four definitions of residential density, relative to open spaces. This is assuming that it is not possible to define the density from the outset without examining the nature of the spaces to which they will be applied. The principle that underpins this policy states that the mix of the urban built density depends on the size of the space in question, and the size of the open spaces contained within it. The means for achieving a proper mixture are legislation, enforcement, imposition of taxes and providing incentives.

The responsibility for the practical application of the built densities policy is divided among the local authority and the implementing agency. The authority must provide municipal services and infrastructures so as to ensure good transportation access to the residential project. The implementing agency must ensure added values for residents who live at a higher density level and, in particular, must be certain that their quality of life is not compromised either during or after the change.

Environmental Evaluation System for Buildings and Spaces

One of the more interesting questions with regard to urban environmental quality is how to assess, objectively and comparatively, the quality of a city's built-up area — is it the environmental quality of an isolated residential building or that of a residential complex or a neighborhood? Many city dwellers could instinctively define what environmental quality means for them: they would emphasize the need for cleanliness in the streets and around the trash dumpsters, they would mention noise problems caused by a variety of sources, they would describe the lack of certain services, and so on. In order to objectively evaluate the quality of a home in a particular environment compared with a home in another part of the city, we would need objective data and a precise measuring tool.

A person spends most of his life in a built-up urban environment, whether in his apartment, his place of employment, or when traveling to other cities, and his economic activity has an effect on the environment and is influenced, in turn, therefrom. Nonetheless, Israelis cannot get clear, reliable and updated information on the ecological status of their immediate environment. What is lacking, therefore, is a comprehensive system of environmental data, as well as a channel for transmitting such data to the citizen. Israel's present social and legal structure makes it very difficult for citizens to receive such reliable information because of public bodies' dependence on various economic interests. Only an independent body can provide citizens with the latest objective environmental information in an ongoing and structured fashion.

This paper proposes a model for an environmental evaluation system of units built and built-up spaces based on a combined, uniform, parameter. These systems, which have been operating in different countries for decades, are known as "environmental evaluation systems for built-up areas."

Key functions of the environmental evaluation system are:

- ❖ To serve as an authoritative and objective source of information for the public and the authorities;
- ❖ To serve as a tool for planners and architects; and
- ❖ To serve as a tool for comparative valuation of real estate property.

Criteria for assessing the built environment, which are used to set land prices, include the level of functioning of the built object; its form, including its visual, artistic or historic value; and the possibility of saving (energy, water, etc.).

Citizens' accessibility to updated and comprehensible environmental information will increase the impact of environmental criteria on real estate prices, such that they would become part of the considerations used when an Israeli consumer purchases a property. These criteria would also take into account environmental conservation and protection of people's health. Using methods to assess the environment will be very effective for adopting proper maintenance of the environment and residential buildings, and imposing economic boycotts on goods and services that have a negative environmental impact.

A person experiences the urban environmental quality through his various senses. Noise — through hearing; air pollution — via smell; and overall environmental satisfaction — with the sense of sight. These sensations allow him to form his own narrative regarding pleasure and dissatisfaction with his environmental conditions, beauty of the scenery, cleanliness of the immediate and more distant surroundings, esthetics of the built-up fabric and the buildings, commercial centers, outdoor furniture and lighting, the interest he finds as a pedestrian walking down the streets, the care given to public gardens and playgrounds in his neighborhood or his own backyard, and the level of overall municipal maintenance of roads and sidewalks. Thus, one's sense of sight plays a key role in formulating an overall impression of the quality of the environment in which one lives, or of the environment in which one would like to live.

Esthetics and the Environment

The esthetic sense is highly individual, and it is difficult to form generalizations or to find a common denominator among people in this regard. Nevertheless, with studying and training, one can become skillful in understanding this topic.

It is hard to ensure esthetic quality by applying particular indicators, but it is possible to find three central urban domains which, if they are part of appropriate and sustainable planning, can help achieve a proper perspective on the topic: the public space, the built area, and the heritage of the past.

The most important public space is the street. There is an essential difference between a street and a road, in terms of the priority given to pedestrians on the street and to private vehicles on the road. A combination of the two can be seen in the wide European boulevard. Here, there is a special path for pedestrians, and the relationship between the height of the houses and the width of the boulevard gives one a wide field of vision. Landscaping and shaded walking paths, along with the pedestrians' interest in municipal activities on both sides of the thoroughfare, are the esthetic foundations of the typical urban boulevard. The size, distribution and quality of the open spaces, combined with squares surrounded by homes, complete the components for a city's esthetic quality.

Architectural differences and variety, the combination between the public and private domains, the relationship between the built and open spaces, the distinction between the monumental and the ordinary, the integration between different types of land use, the harmony of the language of architecture in which every detail is a piece in an elaborate mosaic, and the various means used to decorate the city (sculptures, murals, and the like) — all these contribute towards creating an esthetic portrait and the feeling of pleasure felt by visitors to the city.

The way in which the built heritage, throughout the generations, is considered part of the modern urban fabric can be used as a criterion for promoting urban esthetics. The degree to which architectural sites are preserved, restored and integrated within the changing city, while endowing them with new functions, also has an impact on the quality and esthetics of the built urban space.

The green parameter is a key factor in the esthetic quality of urban spaces, both old and new. In many cases, greenery and landscaping can restore a human-scale quality to the city.

Public Participation and the Urban Environment

Urban environmental quality is sometimes achieved only after public battles, between municipal authorities and planning institutions and between various groups of residents who may, at times, have interests that are contrary to the perspective of the local authority. Arguments that stem from conflicts of interest create different types of mechanisms for dialogue, which are generally referred to as “public

participation” or “public involvement.” In recent years there has been a growing public awareness of the need to play a more active role in designing the environment in which we live. On the other hand, the authorities have also learned, albeit sometimes the hard way, that they must include residents in issues that affect them directly, rather than surprise them with different plans or changes that are liable to jeopardize the environmental quality of large portions of the population.

At the dawn of the third millennium, most of the world’s population chooses to live in cities. Environmental quality, in the broadest sense of the term, is closely related to the quality of life of the urban resident. The two actors that have the strongest influence on the quality of life in the urban environment are: the residents — in the way they relate to environmental issues — and policy-makers and decision-makers — in the way they plan and implement a series of policy measures that could potentially improve, or destroy, the urban quality of life. Planning decisions that influence the urban environment are usually characterized by the fact that they are made by the administration, with the help of content experts and planners. Residents play a minor role and their ability to influence and change decisions that dictate the quality of their lives is limited. Decision-makers, or planners, tend to weigh various alternatives and choose the one they prefer in terms of “the public interest,” as they perceive it. This concept would seem to reflect a balance between the needs of people and groups of citizens often defined as “narrow interests” and between “the greater good,” as perceived by policy-makers. Realization of that interest is the rational basis underlying urban planning and development. But environmental quality is often trampled in the name of “the public interest” and various populations in the city are hurt in its wake.

Over the last decade Israel has undergone impressive development in the public’s awareness of environmental issues and planning, and the ability of individuals, groups and communities to influence urban environmental quality through planning and the use of policy tools. On the other hand, there are still many people who are not cognizant of the importance of planning and its impact on the environment. The last article in this collection calls upon four main target populations: decision-makers and policy-makers, the public at large, planners and professionals involved in urban planning, and advisors involved in process of public participation. Everyone wants to have a spacious apartment, and everyone wants clean air. The question is, what is “clean” and who gets to define it; and

what is the price we are willing to pay in order to reduce open spaces in the city for the sake of constantly increasing the size of the average housing unit? These are clearly questions of values, and therefore the answers cannot be based solely on the opinions of environmental experts, no matter how professional and well trained they may be. Issues pertaining to public participation are also a matter of values. They are based on an acceptance of democratic and pluralistic values, without which there is no conceptual basis for public participation. The idea that the public has a fundamental right to be involved in the decisions that affect their lives is a values statement, by definition. Since urban environmental quality is determined, to a large extent, by planners, decision-makers and policy-makers who influence the quality of life of each individual, the public has the right to have a say in these matters. Through involvement and participation, the public can have an influence on planning, the decisions that are made and policies that are formulated.