

## Towards more User-Friendly Public Open Space in Low-rise High Density Housing Areas

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### 1 ABSTRACT

Can we provide enough both affordable and attractive housing at locations where people want to live? Nowadays, low-rise high density housing represents more and more possible answer to this question, as well as the answer to the problems of (un)controlled expansion of cities and using high-quality agricultural soil, the problems of the urban sprawls and decay of city inner areas. Although there are many understandable differences between countries, caused by specific institutional, systemic and planning framework, several common principles can be identified: location and sense of a place, successful allocation policy and occupancy, successful management approach, and good and quality urban and architectural design. Attractive and popular low-rise high density housing can be achieved when a number of interrelated factors are applied - a network of user-friendly, effective and generous open spaces (multy-use squares, parks, green spaces, pedestrian walks, courtyards, gardens etc.) is one of key element of urban and architectural design approaches wich is preparing in order to support environmentally friendly housing and improving quality of resident lifestyles. Through the balance both private and public space for the residents, the high density living can promotes a greater sense of community, social interaction and cultural enrichment. This paper provides recommendations related to the significance and key principles of urban and architectural design of user-friendly open spaces in high density residential areas through theoretical approaches, institutional frameworks and good practice design.

### 2 INTRODUCTION

Despite many public and policy debates and researches, there is still a profound wariness about high density housing because of its assumed association with high rise, which has a bad reputation. High density housing causes many concerns, as majority of people connect it with unpopular housing types and lower quality of living. Certainly, high-rise living brings with it a set of preconceptions and physical and social problems (many of the tower block estates of the 1960s and 1970s proved to be social failures, with their monotonous, monumental forms and inadequate internal space standards). But, the compact city and intensive development does not necessarily imply high rise buildings. High-density living it could mean relatively low-rise blocks of five or six-storey buildings with their own communal space and variety of layouts and built forms. Due to this, the same number of units can be accommodated in different spatial forms - towers, terraces or courtyards, which have different social impacts on their surroundings and residential communities. Also, we often forget that high density housing also includes examples such as urban villages or historic picturesque towns. The important fact is density of a specific site, in relation to its design, facilities and the general standards and behaviors in the neighborhood and the people who will live in the housing.

According to many theoretical research and practical experience, there is a ten key criteria for a sustainable home and housing - **high density-low rise** and **open spaces** are most important. Another are: privacy; affordable; security; flexibility; adaptability; extendibility; economical; enhance environment. High-density residential areas have clear advantages. They are more economic to service; they have a lower impact on the environment; and they provide a wide choice of facilities within easy reach. Above all they make transport systems of high energy efficiency possible.

According to Sauer (1970) low-rise high-density housing is based ultimately on four principles:

- 1) to reach adequate real-estate densities suited to an urban setting (350-550 inhabitants per hectare) through blocks not more than four storeys high;
- 2) to provide each home-unit with a strong sense of individuality with the clear identification of separate elements of access, as far as possible directly from ground level;
- 3) to eliminate spaces without a precise territorial connotation, in particular to privatize most of the outside spaces by relating them directly to home-units;

- 4) instead of keeping housing blocks, streets and spaces separate, to create continuity of the constructions by a system of 'built fabric', governed by a grid and achieved by a system of overlapping home-units'.

So, the density itself does not appear to be an issue - there is no such thing as an optimum density, and density alone is not the key to successful housing<sup>1</sup>. Many other factors contribute to this - **good urban and architectural design** is one thing, the **quality of housing management** is another<sup>2</sup>. Cultural and social factors also contribute to whether high-rise living are a success or a failure.

The key principles behind **good urban and architectural design** are: 1) the way a place functions within its wider context; 2) the quality of the public realm - safety, amenity, vitality; 3) the right mix and density of uses connectivity; 4) scale and bulk effect of buildings; 5) character and heritage; 6) natural environmental qualities; 7) environmentally sustainable design and building. Poor design is often characterised by buildings that are out-of-scale with blank facades and no activity or interest at street level, vast areas of concrete and parking, spaces and places that are inaccessible to the pedestrian, unsafe or unpleasant spaces, empty, run down and underutilised.

The value of better urban and architectural design are: 1) better public health; 2) greater social equity; 3) enhanced land values; 4) a more vibrant local economy; 5) reduced vehicle emissions; 6) more sustainable use of non-renewable resources.

This paper shows how **user-friendly public open space in low-rise high density housing areas** can contribute to achieving some of these values and to better living conditions.

### 3 OPEN SPACES IN HOUSING AREAS – KEY ASPECTS AND CHARACTERISTICS

Open space is sometimes treated as a leftover, but it contributes greatly to the quality of urban life and quality of housing. Today, public spaces have become an asset upon which cities build their image and upon which developers sell real estate. But public space is more and more recognized as an essential ingredient to the sustainability of cities for social, economic, and ecological reasons. Public space stands as a reflection of a city's spatial and social organization and thus also constitutes a tool for social reproduction and social change.

There are three definitions of open space. For designers: public space has long been conceived of as "open space", meaning the publicly owned outdoor spaces such as plazas, parks, courtyards and all spaces in between buildings; it is a factor of **public health** both in terms of **recreation** and **respiration**. For political scientists: public space is an immaterial **space of debate**; it is thus a model for political discussion or at least a space of **conviviality**. For sociologists: public space is a place **accessible to anybody** and reflects a notion of **basic equality, social freedom** of circulation and anonymity. Generally, "hard" spaces such as plazas, streets, malls and courtyards provide settings for public activities of all kinds. "Soft" spaces such as parks, gardens, lawns, and nature preserves provide essential relief from harsh urban conditions and serve as space for recreational activities. These "amenities" increasingly influence which cities or housing areas will be perceived as desirable places to live.

#### 3.1 Aspects of open space

It is possible to identify four aspects of open space which are important for quality of life in low-rise high density areas: 1) design and comfort; 2) diversity and opportunity; 3) safety and 4) sociability (Table 1.).

##### 3.1.1 Design and comfort

This aspect is addressed by current national and local urban planning policies and activities. Many studies relates to the design and comfort of communal open space **provisions**, and indicated that there is a need for communal open spaces to be conveniently located and constructed to a size that allows a wide scope of activities and uses to occur. Attractive and popular low-rise high density housing can be achieved when a number of interrelated factors are applied, including generous external space standards. The examples of good practice show the benefits of that kind of open space treatment. Microclimate is also emerged as a key factor. The physical features and urbo-architectural structure and combinatorics provided impacted on communal spaces' perceived importance and actual usage levels. It is possible to identify a number of factors: facilities, materials, lighting, extent and type of greenery, useability throughout year, etc.

<sup>1</sup> High density housing is housing designed to hold significantly larger number of people than is typical for particular area of land in that particular region. There is no universal definition. There is usually a local definition in the zoning laws, such as *more than 10 units (separate living quarters: apartments, townhouses, etc.) per acre, or over 60 dwellings per hectare and generally five-storey or more high, for example apartment buildings* –

<sup>2</sup> Mounday, B: "Space invading", Society Guardian, 2002.

Aspects	Components
Design and Comfort	Layout and Size Microclimate Physical Features Accessibility
Diversity and Opportunity	Scope of potential uses Appeal and accessibility to different user groups Appeal and accessibility to different user groups
Safety	Surveillance Physical Features Maintenance of Communal Open Spaces Walkability
Sociability	Facilities Accessibility Design and Comfort

Table 1: Aspects of open space important for quality of life in low-rise high density areas

### 3.1.2 Diversity and opportunity

The second aspect important to residents relates to the potential range of activities and uses possible in communal open spaces. Scope of potential uses, appeal and accessibility to different user groups and appeal and accessibility to different user groups are key components of this aspect.

### 3.1.3 Safety

Communal open spaces should be safety for all users, equipped to facilitate active and passive surveillance. Physical features are most important for the sense of safety, belonging and caring for communal open space. Many residents don't "feel comfortable" in facilities leading to underutilization. Finally, levels of cleaning, repair and maintenance were key factors for residents.

### 3.1.4 Sociability

Communal open spaces may facilitate contact and relations between residents of high density residential developments (Randolph, 2006). The findings show that sociability was influenced by particular urban and architectural design aspects of the facilities. But, a certain open space can support, not initiate social interaction between residents.



Fig. 1: Borneo-Sporenburg, Amsterdam. The Borneo Sporenburg plan divides the grid of low-rise buildings in three zones with architecturally distinctive high-rise residential buildings, or "sculptural blocks", which create significant landmarks within the harbor landscape. These sculptural blocks also contain **collective open spaces** in the forms of **courtyards** or **gardens**. The **water surrounding** the docks serves as the **dominant public space**, open to Amsterdam's boating culture. These requirements resulted in a design that features a rhythmic interplay of built and unbuilt forms. Repeating the type in a great variety of dwelling models with maximum architectural variation. Each dwelling has also a front door onto the street creating a street frontage and its own, exterior space. All private outside spaces as well as parking places are to be found within the parcel.

### 3.2 Characteristics of open space

Characteristics and quality of open spaces are in direct causal relation with the applied principles of urban planning and design as well as architectural design of low-rise high density housing areas. Form of many of this areas or districts can be defined as “**compact**” **urbanism**, often follow a grid structure with a semi-open block form, which providing open access to the courtyards of residential blocks, private gardens for each home on the ground floor of the blocks as well as varieties of open spaces. Good practice examples has adapted the urban design theories of New Urbanism, Transit Oriented Development, and Smart Growth into its core. New Urbanism principals can be found in the project’s approaches towards achieving sustainability. These strategies are “minimum impact development, eco-friendly technologies, respect for ecology and value of natural systems, energy efficiency, less use of finite fuels, more local production, and increase walking and reduced automobile dependency” (New Urbanism 2007). Transit Oriented Development (TOD) Theory is applied in the transportation infrastructure dimension of the some projects. This is an urban design theory which focuses on sustainable urban living as based on a medium density living being connected to public transport systems. Smart Growth Theory is applied to the some projects by focusing on concentrating urban growth in city centers by planning and transportation systems to avoid urban sprawl. The theory advocates for compact urban development, TOD, **walkability**, and **mixed development land use planning** (Smart growth Network 2007)<sup>3</sup>. Some of projects demonstrated how high environmental targets can be met through the use of a well developed master plan with high levels of investment in infrastructure to support **environmentally-friendly housing** and residents lifestyles.

The basic principle in **architectural design** is **great variety** of dwelling models with maximum **architectural variation** - the resulting designs include balconies and terraces, patios, roof gardens, private garden for ground floor units etc.



Fig. 2: Hammarby Sjöstad, Stockholm. The residential districts adjacent to the main spine follow a grid structure with a semi-open block form, which allows for maximum light and views as well as providing open access to the **courtyards** of residential blocks. Most apartments have **balconies, terraces and green roofs**, which provide overlooking onto the **streets, waterfront walkways and open spaces**. A **network of varied parks, green spaces and walkways** runs through the district as well as **pedestrian walks, quays and linear parks** across the waterfront. The street dimensions, block lengths, building heights, density and usage mix were designed to take advantage of water views, parks and sunlight. Reduce car usage and alternative transportation options at the planning and implementation, the possibilities to sporting and leisure activities, inner courtyard or play area, public spaces, restricted building depths, ecological building materials, solar panels etc. are just a few elements of design code which is preparing in order to support environmentally friendly housing and improving quality of resident lifestyles. Some of the **environmental goals for land usage** are: 1) open space standard: there shall be at least 15m<sup>2</sup> of courtyard space and a total of 25–30m<sup>2</sup> of courtyard space and park area within 300m of every apartment (equiv. 100m<sup>2</sup> BTA), 2) at least 15 % of the courtyard space shall be sunlit for at least 4–5 hours at the spring and autumn equinoxes, 3) development of undeveloped green public spaces shall be compensated for in the form of biotopes that benefit the biological diversity in the immediate area, 4) natural areas of particular value shall be protected from development.

<sup>3</sup> Hammarby Sjöstad Stockholm, Sweden: A Case Study, CP 249 Urban Design in Planning, 2007

The quality of low-rise high-density housing and treatment of open space varies enormously across the globe, but several common characteristics of quality open spaces can be identified:

- layout and size of open space,
- diversification and wide range of varieties of forms and contents of open space,
- hierarchical relationship between different types of open spaces,
- different ownership (private, semi-private, common),
- generous standards,
- walkability,
- social sustainability and equity,
- environmental friendly.



Fig. 3: Crown Street – Glasgow. Each of the residential developments is designed as a perimeter block and set around a **communal garden** that can be used by the residents. Each home on the ground floor of the blocks also has a **small private garden** that backs onto the **larger communal garden**. Each block has been designed by a different architect and features a theme of decoration and street art, either through murals or sculpture, in order to create distinctiveness and a sense of place.

Many projects focus also on the dimensions of creating a **sustainable social sphere**: social sustainability, human sustainability, social equity and environmental education.

In terms of social sustainability, the projects **balances both private and public space for the residents**, and ensures priority is placed on social capital. The high density living in Hammarby Sjostad, for example, **promotes a greater sense of community through development of programs and processes that promote social interaction and cultural enrichment**. A specific example of social sustainability in architectural design would be the inclusion of the overhanging balconies from individual apartments. This design element heightens the sense of a common space below the balconies, and encourages more social interaction (Natural Space 2007).

In many cities, specially in UK, higher density housing is not only necessary because land is scarce, but also desirable as it can deliver real social benefits. For example: 1) much of the more desirable housing in urban areas is of a higher density design; 2) higher density housing in existing urban areas creates vibrant, successful neighborhoods, and the number and variety of people who live there support local shops, transport and community facilities; 3) higher density neighborhoods do not mean all higher density housing is the same (a combination of housing types allows for different designs at different times in a person's or a family's life), and 4) higher density housing allows for private outdoor spaces and for shared a wide rang of open spaces and shared facilities.<sup>4</sup>

Typology and varieties of open space in low-rise high density housing areas are shown in Table 2.

Typology	Characteristics
Public parks	
Commons	A large green areas, now used for leisure activities, connected with housing areas.
Neighborhood park	Open spaces developed in housing areas, publicly developed and managed as a part of the zoned open space, or as a private residential development (may include playgrounds, sport facilities etc.).
Courtyard park	Small urban park bounded by buildings.
Streets	
Pedestrian sidewalks	Part of housing areas were residents move on foot, most commonly sidewalks and paths which connect one destination with another.
Traffic restricted streets	Streets used as a public open space, traffic and vehicle restriction can include pedestrian improvements and sidewalk widening, street tree planting, appropriate materials and street furniture.
Greenways and linear parkways	
	Interconnected recreation and natural areas connected by pedestrian and bicycle paths.
Waterfronts	
	Open space along the waterways in housing areas or districts, increased public access to waterfront parks.
Community open spaces	
Community garden	Neighborhood places designed, developed and managed by local residents (often on private land); may include viewing garden, play areas and community gardens
Playground	Play area located in neighborhood, frequently includes traditional play and urban equipment.
Courtyard	Small place bounded by buildings, frequently includes traditional and urban equipment and greenery.
Private (and semi private) open spaces	
Atrium/patio	Private outdoor space or common place for building residents.
Roof garden/terrace	Private outdoor space for top floor flats, or a as a common place for building residents.
Private gardens for ground floor flats	Private outdoor space, often private entrance to, for ground floor flats; thus mitigating one of the perceived disadvantages of apartment living.
Balcony and terrace	Private outdoor space which provide sense of individuality, perceived disadvantages of apartment living and provide overlooking onto the open spaces.

Table 2: Typology of open space important for quality of life in low-rise high density areas

**Safer streets** are one of basic principle as well as a great problem in urban design approaches of low-rise high density housing. Streets that are overlooked by homes not only feel safer but are safer, with much lower rates of burglary. Slower car speeds, more walkers and cyclists mean it is safer for children to walk to school or play outside. Higher density development can increase site values, which in turn can provide higher-quality open public spaces like home zones being introduced in some areas to provide safe outdoor playing space.

**Walkable** housing areas and communities are desirable places to live, work, learn, worship and play, and therefore a **key component of smart growth**. Their desirability comes from two factors. First, walkable

<sup>4</sup> "Better Neighborhoods: Making higher densities work", CABE, London, 2005.

communities locate within an easy and safe walk goods (such as housing, offices, and retail) and services (such as transportation, schools, libraries). Second, by definition, walkable communities make pedestrian activity possible, thus expanding transportation options, and creating a streetscape that better serves a range of users - pedestrians, bicyclists, transit riders, and automobiles. To foster walkability, communities **must mix land uses and build compactly**, and ensure **safe and inviting pedestrian corridors and open spaces**. As the personal and societal benefits of pedestrian friendly housing areas are realized – benefits which include lower transportation costs, greater social interaction, improved personal and environmental health, and expanded consumer choice<sup>5</sup>.

**Private outdoor space** is also very important characteristic for quality living. Most of people put a **high priority** on having a small place in the sun even if it was only their own balcony (the space might be only a few meters square but it gave residents the chance to relax outdoors in privacy, to read a book, do a spot of gardening or have a barbeque). This private outdoor space was seen as vital in making high density living acceptable for a wide cross-section of different households. The principles of high protection also applied to **balconies**. They were most useful when they afforded a degree of privacy to the householders. Screening might be provided by walls, railings, canopies or strategically placed pot plants and shrubs. Balconies were also valued when they were large enough to be used for relaxing outdoors and when they had a pleasant, sunny aspect. Some of residents sometime wanted their private garden, patio or yard to be fully screened by high fencing or walls so that outsiders could not easily see in. Bushes and trees can be also planted to give extra privacy.<sup>6</sup>



Fig. 4: Accordia, Cambridge. **Private outdoor space** at two levels, with first floor **terrace** and **courtyard** below.



Fig. 5: Angel Waterside, Islington. All apartments benefit from external private space, either in the form of **balconies**, which are big enough to sit out on, or **small gardens** for the affordable maisonettes in the northern block.



Fig. 6: Graham Street, Islington. **Roof garden/terrace** - private outdoor space for top floor flats.



Fig. 7: Accordia, Cambridge. The **patio** courtyards.

<sup>5</sup> "Complete" Streets, Courier-Journal 3/8/2007

<sup>6</sup> *Perceptions of Privacy and Density in Housing*, Report on Research Findings prepared for the Popular Housing Group, Mulholland Research & Consulting, London, 2003.

However, higher density living necessitates some sacrifices of private outdoor space: some form of communal garden is often provided to compensate for necessary strictures on private garden space.

**Shared outdoor communal spaces** can bring many social benefits and improving quality of life, but also can present problems. Residents of a block may all have different ideas about how they would like to use the space. A family may want their young children to play. Some residents may want to invite friends for socialising, while others may simply want a quiet outdoor area to relax. With all these competing wants, residents can easily become unhappy with how communal areas are used if it disturbs their own privacy or peace and quiet<sup>7</sup>. A key element in the success of communal space is whether it is made a **safety place for children play** as well as for other users. The form of the inner **courtyard** provides an opportunity for the realization of this objective. Aims of many research is to examine the potential of using the high density low rise courtyard house form as solution for creating family housing in urban areas that can adapt to changing needs of the users over time.



Fig. 8: Coin Street Community Builders, London. Communal open space/courtyard; safety **playground** for children and young people; **private garden** for ground floor flats/ railings, bushes and trees give extra privacy; use of **balconies**. All homes have access to a **central garden**.



Fig. 9: Adelaide Wharf, London. Communal open space at the centre/U shaped **courtyard**. About Adelaide Wharf is particularly striking its ambition of combining good quality private sector apartments with social housing in a non-hierarchical architecture. Whilst the private apartments overlook the canal, the social housing element enjoys views over the expansive park to the south.

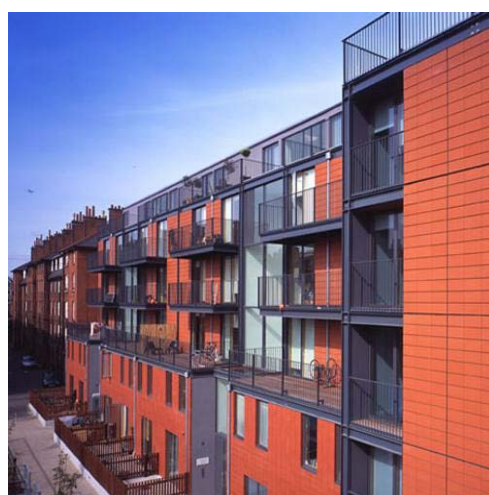


Fig. 10 and 11: Beaufort Court in Lillie Road, West London. The first social housing project in the U.K. to incorporate three off-site prefabrication approaches. The project has provided **open space** and **private amenity space** in the form of **gardens** and **balconies** that many residents had not enjoyed before as well as place for **sport activity** and **playground**; the project has created a high quality urban environment for a wide range of people, creating a much greater sense of community and comfortable living accommodation. Innovative and stylish design typical of high cost private sector developments has been used to provide affordable housing.

<sup>7</sup> <http://homedesign.wordpress.com/2007/09/09/high-density-housing/>



Waterfronts, greenways and linear parkways, pedestrian sidewalks and traffic restricted street and public parks are most important for build of social and environmental sustainable and user friendly open spaces network. It should give scope for adults and children to enjoy passive and active relaxation and psycho-physical regeneration, social contacts and contact with nature.



Fig. 12: Hammarby Sjostad, Stockholm. **Linear parkways.**  
Access to green space.



Fig. 13: Hammarby Sjostad, Stockholm. **Pedestrian street.**



Fig. 14: Angel Waterside, Islington, London. The scheme creates a **pedestrian and cycle friendly public space** along the canal with mature planting and public seating – the long-term goal is for a canal side linear park to connect all the way up the basin. Ornamental grasses form the highlights of bold mixed borders separating **public** and **semi-private spaces** and reflect the architectural rhythm of the buildings behind. On the canal side, large glazed elevations are punctuated by recessed and projecting balconies which maximise views of the park and waterside.

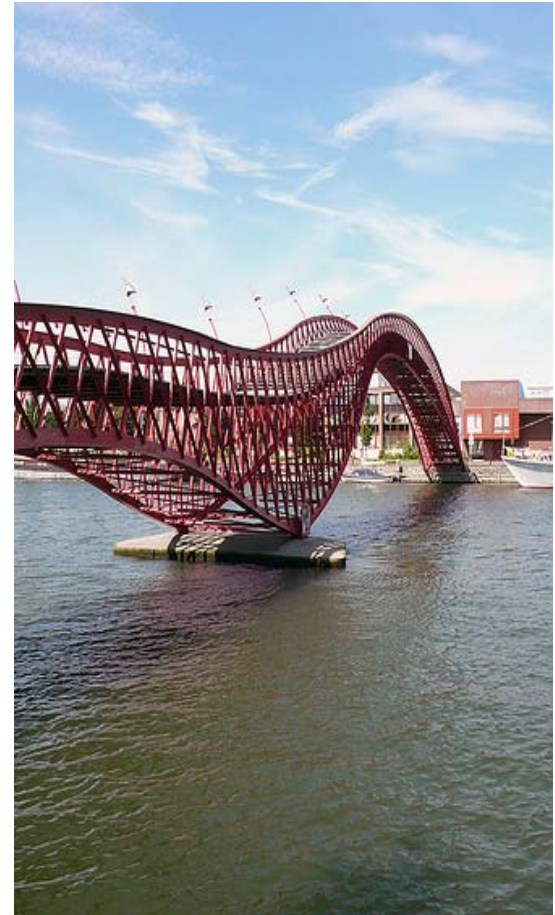


Fig. 15: Borneo Sporenburg, Amsterdam. Pedestrian bridge

## 4 CONCLUSION

Higher densities are sometimes controversial, and are not always appropriate. However, when well designed and built, in the right situation can be a means of creating better neighborhoods and life style. Many recent projects have shown that the benefits of low-rise - individuality of the dwelling, clear ownership structures and optimal privacy - can also be achieved in very high densities. Often used for larger urban extensions or comprehensive block redevelopment, high-density low-rise housing gives opportunities for personalising each dwelling.

There is enormous interest in urban design and the regeneration of our urban areas, but current thinking often concentrates on the built form, forgetting the important role that open spaces. Many research and best practical experience prove the opportunities and benefits of different types of open space in housing areas to society and individuals. Open spaces can provide the social, health, environmental and economic benefits and opportunities. The quality of low-rise high-density housing and treatment of open space varies enormously across the globe, but several common characteristics of quality open spaces can be identified: layout and size of open space, diversification and wide range of varieties of forms and contents of open space, hierarchical relationship between different types of open spaces, different ownership (private, semi-private, common), generous standards, walkability, social sustainability and equity, environmental friendly.

Successful housing depended of many factors, but **good urban and architectural design** the **quality of housing management** are the key factors which are in casual relationship with use, treatment and quality of open spaces. Features of successful low-rise high density housing schemes depend to a large extent, by way of treatment of open space: 1) good sound insulation between dwellings; 2) relationship with the surrounding area in terms of connectivity, scale and integration; 3) proximity to good (reliable, clean and safe) public transport; 4) **priority for pedestrians and cyclists**; 5) **high-quality open space** to provide visual relief and recreation; 6) some usable **private outside space, such as patios or balconies**; 7) **clear demarcation between public and private spaces**; 8) **adequate level of car parking that does not dominate the street scene**. The process of urban planning, urban and architectural design and construction of user friendly open spaces implies a set of coordinated activities which promote: 1) **better design**, 2) **sustainable development** and 3) **larger involvement of the community**. This implies: consensus and partnership between the actors involved in the process – local authorities, public and private sector, investors, planners and designers. Low-rise high density housing can provide better living conditions and become an efficient means of sustainable spatial, social and economic development of many cities and can be successful for all household types with any range of economic circumstances – but only if it is high-quality living, facilitated by quality design and intensive management, supported by appropriate occupancy levels, procured through sensitive allocation policies.

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