

SECTION 2
HOUSING: DENSIFICATION AND SUSTAINABILITY

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I. Understanding densification

The anti-planner and urban activist Jane Jacobs's manifesto *The Death and Life of Great American Cities* opens with the statement: "This book is an attack on current city planning and rebuilding".¹ In outlining four qualities that any city neighbourhood must manifest in order to be healthy and desirable to residents, namely mixed primary uses, short blocks, aged buildings and high density, she revisits the subject of a timeless way of building and planning, radically different from the approach to urban planning at the time (the 1960s). She answers the question of what the proper densities for city dwellings should be as follows:²

"The answer to this is something like the answer Lincoln gave to the question, 'How long should a man's leg be?' Long enough to reach the ground, Lincoln said. Just so, proper city dwelling densities are a matter of performance. They cannot be based on abstractions about the quantities of land that ideally should be allotted for so-and-so many people (living in some docile, imaginary society). Densities are too low, or too high, when they frustrate city diversity instead of abetting it. We ought to look at densities in much the same way as we look at calories and vitamins. Right amounts are right amounts because of how they perform. And what is right differs in specific instances."

Residential density is a complex system in which various parts interact with each other and with parts of other systems in different ways, with influences on urban development and residential environments. It is impossible to establish all the components affected by or affecting density and the relationship between them. Moreover, the perception of density varies between countries, within countries among different social groups, and even within social groups, where factors such as gender, age, occupation, marital status and income affect people's perceptions of their environment.

There is no single definition of medium density. For the purpose of this resource book, 'medium-density housing' refers to increased gross residential density in urban areas by means of formal housing development. Medium-density housing, defined in terms of dwelling units per hectare (du/ha), is approximately 40–100 du/ha (gross). The dwelling types typically associated with residential densification referred to in the book are semi-detached housing, row housing, and three-storey walk-up flats.

I.1 Measuring density

Measurement of density consists of three components: building density, occupancy density and population density. They are interrelated, mutually dependent and determined by other factors. The relationship and interdependence between them and between the factors that determine them can be identified and calculated:

1. **Building density** refers to the number of dwelling units per area (usually expressed in terms of hectares and measured in floor area ratio) and is determined by the space between buildings, building width, building configuration and building height. Gross residential density refers to the number of dwelling units divided by the total site area, while net residential density refers to the number of dwelling units divided by the area of the site taken up by residential use only. Net residential density is always higher than gross residential density and can be increased by decreasing the size of units or plots and increasing the height and coverage of buildings. Different housing typologies (such as flats and row housing) can be compared using net residential density. The increase in gross density is limited by social facility and open space standards. When the number of people in an area increases, more facilities such as open space, schools and streets are needed, taking up more space and thereby lowering gross density.
2. **Occupancy density** (measured as floor space rate) is directly related to income, the cost of floor space, and the need for space in terms of family size, which refers to the number of people per dwelling unit.
3. **Population density** (measured as persons per hectare), is a product of building density and

occupation density. This is the number of people per hectare and is expressed as the number of people divided by the site area (for gross population density the total site area is applicable, and for net population density, only the area taken up by residential plots).

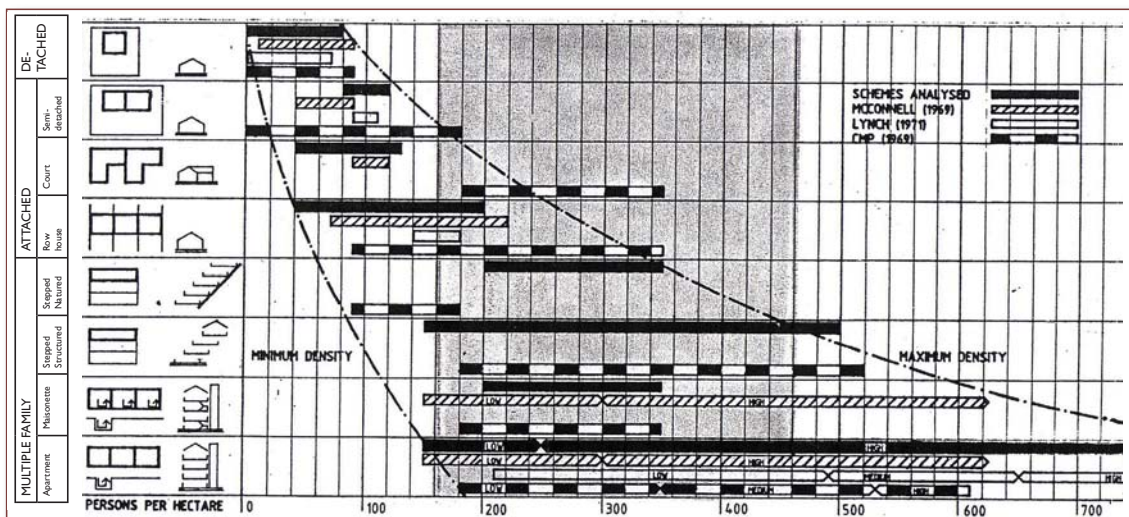
- **Perceived density** refers to the level of density which people feel an area has and is dependent on the individual and his/her background culture and on the nature of the built-up area.
- **Crowding** is closely linked to density and refers to too many people living or working in a room, dwelling, neighbourhood, or on a plot. There is an important difference between crowding and density: it is possible to have high-density housing without crowding.

1.2 Density, built form and housing layout

Building density is inherently bound up with built form and housing layout. Built form refers to the physical form of a residential area in terms of building height, land coverage and grain of the buildings, while housing layout is the organisation and utilisation of land for buildings, roads, cars, pedestrians, public and private open space and landscaping.

There is a constant trade-off between building density, building form and housing layout within the restrictions of standards and costs. The challenge lies in optimising these requirements. Density can be determined by decisions made on built form and housing layout. However, a prescribed density will restrict built form and housing layout. Senior states that existing theory poses the following:³

- as density increases, specific quantifiable patterns of housing form and layout emerge. For example, open space ratio falls rapidly as density increases;
- specific thresholds can be determined throughout the density range, below or above which certain characteristics of housing form and layout cannot be achieved;
- housing form and layout have social and economic ramifications – e.g. construction costs increase as density increases; and
- various researchers have ascertained that housing types conform to a regular density pattern.



A number of researchers confirmed that housing types conform to a regular density range. Housing types associated with approximately 30–90 du/ha are row/terraced housing, maisonettes, courtyard housing and three to four-storey walk-ups⁴

Building density does not determine the exact characteristics of housing form and layout, but creates certain limitations on them. Built form and housing layout options at any specific density are limited by the standards adopted for that specific scheme. Where different standards are applied to similar density ranges the housing layout and built form are changed and thresholds are affected.

A standard is a quantity regarded as having special value for the housing environment. It can be a by-law, design criteria or societal norm and is expressed numerically. An example is where a development with no parking and little space between buildings achieves a much higher-density than a similar development with normal parking requirements and greater space between buildings.

Terms and definitions pertaining to density

- Plot size – the total erf area.
- Setback – regulations specify the distance between buildings and plot boundaries.
- Coverage – this refers to the percentage of erf area that can be built upon. Coverage is determined by three elements: the width of buildings, the space between them and their configuration. Maximum coverage is usually 50% for single residential zones and 33,3% in general residential zones where flats are developed.
- Height – regulations specify the permissible number of storeys.
- Floor area is the key to building density, as it is a precise and absolute measure of amount of accommodation, irrespective of standards. It is valid across the whole spectrum of cultural and socio-economic boundaries as it requires no judgement relating to space utilisation or how the building is occupied.
- Floor area ratio (FAR) is the most relevant density control measure for buildings, being the ratio of floor area to land area. It is more complicated than residential density and is suitable for mixed-use development. Regulations specify the total permissible floor area in relation to plot size. FAR is considered the most effective way of expressing a density limit; i.e. the total floor area of the building (adding all floor levels) divided by the ground area of its plot. Ratios may range from 0.1 for very open areas to 2.0 for very dense areas, and have distinct effects on traffic, utility loads, street life, massing, public services etc.
- Rural farmland generally has a FAR of between 0.0005 and 0.02 (built up between 0.05% and 2% of total land area), while suburban areas generally have a FAR of between 0.05 and 0.18 (less than 20% of total land area occupied by buildings.) Inner city densities can range from 0.88 for townhouses to 5.05 for apartment buildings.

FAR is an appropriate density measure for mixed-use developments including business and other uses, whereas building density is suitable to residential areas only.

$$\text{Floor area ratio} = \frac{\text{total floor area of buildings}}{\text{total site area}}$$

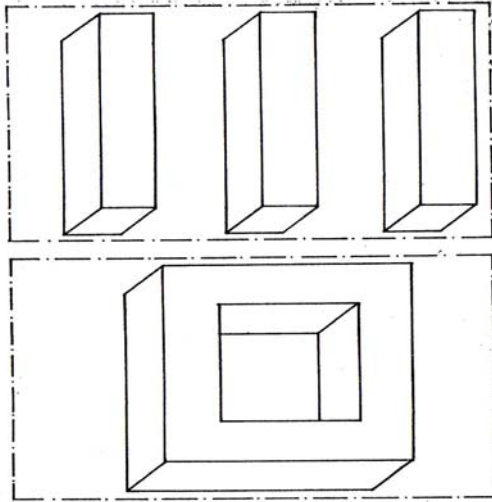
The density at which floor area is occupied determines the population density. The amount of floor space occupied by one person (floor space rate) is the measure of occupancy that can be used for direct conversion from building density to population density or vice versa:

$$\text{Population per hectare} = \frac{\text{floor area ratio} \times 1000}{\text{floor space rate}}$$

Therefore: the size of the plot, the amount of plot which can be built up (coverage) and the height of the building (FAR) give the dimensions of the most visible aspect of density: the amount of space which is built. This is determined by designers in the design phase, and reinforced and controlled in building and planning approvals and development controls. However, this does not necessarily guarantee success, as density is sensitive to external factors.

Acioly and Davidson 1996, Lynch and Hack 1984, Gillham 2002 in Arbury

Coverage and height are directly related to built form, and thus there is a direct relationship between built form and floor area ratio. However, a specific building density does not produce a specific built form because the



Two possible built forms at FAR 0.28⁵

way in which the coverage is distributed on the site can vary considerably – the coverage could be distributed in three buildings or in one building. The height remains constant, yet various built forms are possible.

1.3 Density as a standard

There is a tendency to associate poor environmental quality and low incomes with high-density development, and *vice versa*. User preferences based on experiences with medium-high density housing (for example, flats rented from City Councils), contribute to the negative light in which this type of housing is seen. Hence, the single dwelling unit is still the predominant model of state subsidised housing within the low-income group in most South African towns and cities.

However, environmental quality varies independently of density, with good and bad environments occurring at both high and low densities. It is impossible to relate residential density to environmental quality, as residential environments are determined by more than just density controls. Jensen⁶ states that “(d)ensity expressed as an intensity of occupation is not by itself the sole qualitative measure of housing development, which also depends greatly on planning and amenity standards, and the liveability of homes”. Density cannot be used as an all-encompassing measure of the environment, but is one of many factors affecting environmental quality. In an attempt to achieve better quality urban environments in South Africa, higher densities for new developments should be seriously considered.



High quality medium-density housing on well-located land



Marginalised low quality medium-density housing

Density controls were originally established when a correlation was identified between overcrowding and disease. Since its inception as a basis for public health legislation, density has been used in a variety of ways, for example in strategic planning, development control, detailed design, in the definition of development standards and as a means of maintaining property values in certain areas.

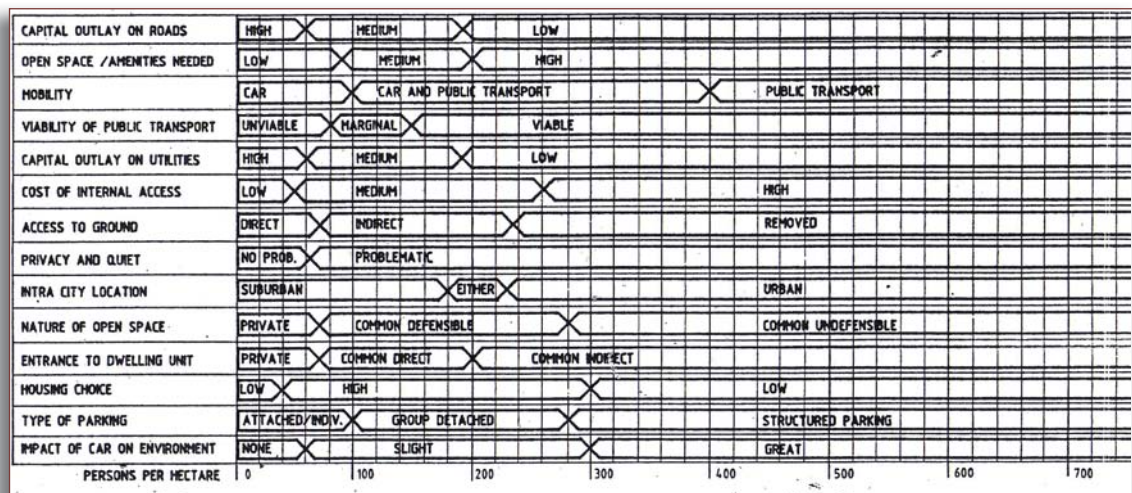
Density is one of the most important indicators and design parameters in the field of housing and human settlement planning and development. It is central to the technical and financial assessment of the distribution and consumption of land, infrastructure and public services in residential areas.

Density has implications for practitioners involved in urban development: planners, engineers, economists and architects use density as the basis for their decision-making. Local authorities, education and health authorities use density as a means of assessing the provision of facilities and services. Planning is strongly regulated by technical and programmatic standards such as density measures. Authorities dealing with urban development operate according to (usually inflexible and fixed) minimum standards formulated in isolation for the ‘optimal’ requirements of different urban elements.

The result is often highly dysfunctional environments that undermine sustainability and frustrate human activity. According to Turner⁷ "...standards are relative and must vary greatly from place to place and from time to time. They cannot have general applicability and should not be thoughtlessly transferred from one environment to another where they may be economically and culturally irrelevant". In principle, it is assumed that higher densities result in better utilisation of land and infrastructure. However, this does not hold true for all situations, as high-density settlement schemes may overload infrastructure and services and apply additional pressure on land and residential spaces, resulting in crowded and unsuitable environments for human habitation. Conversely, low densities may increase the *per capita* costs of land, infrastructure and services, which affects sustainability and constrains social interactions.⁸

There are no absolute standards of density. Four to six square metres of built dwelling per person might be a reasonable standard for low-income areas in developing countries, with 60% private space, 20% public space and 20% circulation as a reasonable guide in practice.⁹ The CSIR *Guidelines for the Planning and Design of Human Settlements* (the Red Book)¹⁰ recommends a minimum gross residential density of 50 du/ha for 'developing areas' in South Africa in order to support commercial enterprises and public transport. Internationally, Alexander and Tomalty found that a density of at least 25 du/ha (\pm 100 people per hectare) is required to make frequent transit services feasible,¹¹ while Maluleke and Luthuli¹² ascertain that densities lower than 80du/ha (nett) are unable to support commuter rail.

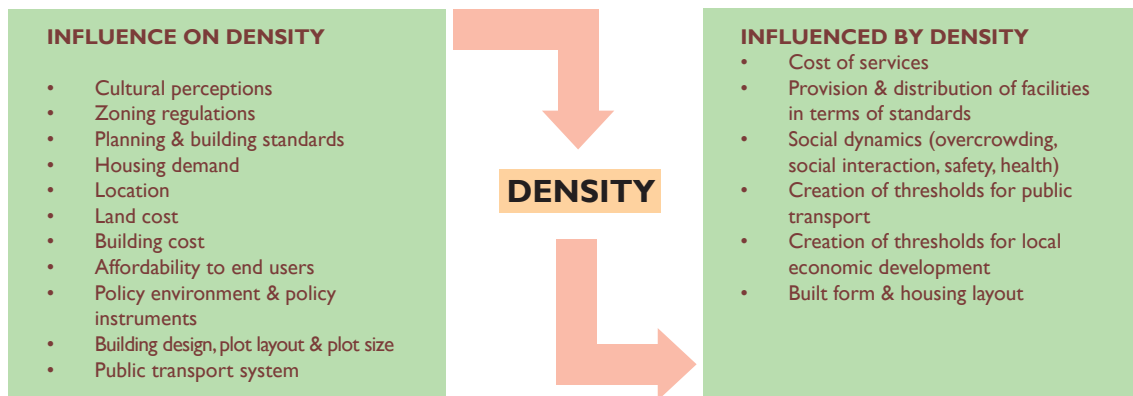
The table below¹³ sheds light on the linkage between a range of densities (measured in persons per hectare) and different features of residential environments. An optimum gross density range of between 150 and 450 persons per hectare (approximately 30 to 90 du/ha) is suggested on the basis of the following:



Certain characteristics do not occur above or below certain density thresholds¹⁴

- capital outlay on roads would be low;
- there would be a significant need for open space and amenities in this environment;
- modes of mobility would be cars as well as public transportation;
- capital outlay in utilities would be low;
- cost of internal access such as passages and stairs would be high, especially for densities higher than 260 persons per hectare;
- access to the ground would be limited;
- lack of privacy and noise become problematic at densities as low as 60 persons per hectare; at higher densities, serious consideration should be given to design of units and defensible space to optimise privacy and ensure ownership;
- housing would be provided in a highly urban or inner-city environment;
- entrances to dwelling units would probably front onto common 'undefensible' passages;

- the choice of housing would be high for densities up to 300 persons per hectare, but would decrease for densities between 300–450 persons per hectare;
- parking would be detached from units; and
- the impact of cars on the environment would be significant.



A summary of factors influencing density and implications of density

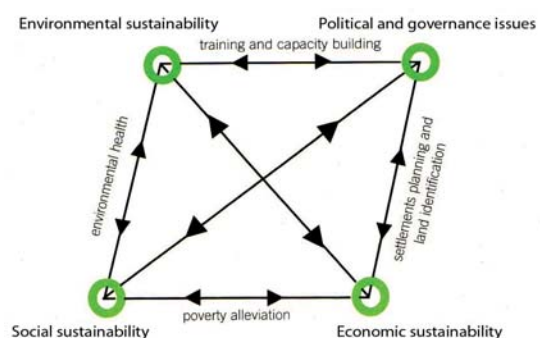
The demand for more efficient, sustainable and affordable urban environments where land is used more intensively, infrastructure and financial spending are applied more wisely, natural resources are used more sustainably and human resources are considered more carefully (especially resources available to the poorer inhabitants of the city), call for the importance of increased density to be recognised.

2. Understanding sustainable development

Sustainable development is defined by the World Commission on Environment and Development¹⁵ as:

“...development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organisations on the environment’s ability to meet present and future needs”.



Four pillars of sustainability¹⁶

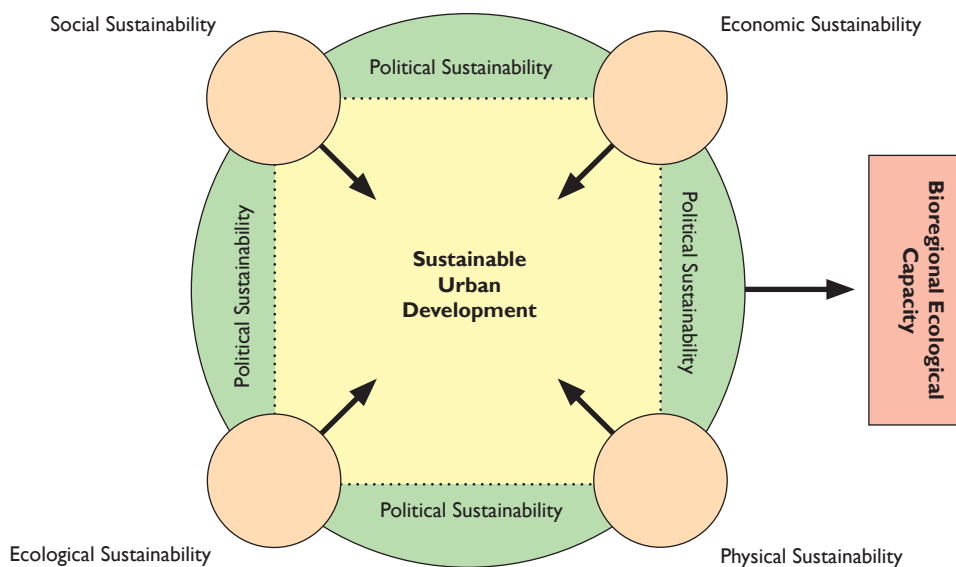
Adriana Allen, an Argentinean scholar, argues that overall sustainable urban development is possible when five distinct spheres are sustainable. These spheres are set out below:

1. **Economic sustainability** – the local economy sustains itself without causing permanent damage to natural resources and without increasing the city’s ecological footprint.
2. **Social sustainability** – policies and actions aim at improving quality of life, equitable access and distribution of rights over the use and appropriation of the natural and built environment.
3. **Ecological sustainability** – the impact of urban production and consumption on the city-region and

global carrying capacity is balanced.

4. *Physical sustainability* – the capacity and aptitude of the urban built environment and technological structures to support human life and productive activities.
5. *Political sustainability* – the quality of governance systems and frameworks guiding the relationship and actions of different actors among the preceding four dimensions. This includes the democratisation and participation of civil society in all areas of decision-making.

Allen asserts that political sustainability is the link between the four other spheres of sustainability, and highlights the importance of having strong political support for processes formulating policies and programmes that advance sustainable development. Importantly, she includes global political economic factors and their local manifestations as major determinants of policy decisions, as subsequent actions are often beyond the decision-making power of bodies such as local governments. In this way, a rebalancing of power is necessary where democracy, participation and discourse are put into effect by the poor and 'powerless' in decision-making processes. This model presents a politically informed approach to urban development in general and integration in particular.¹⁷



The five dimensions of urban sustainability according to Allen et al¹⁸

Achieving sustainability in each sphere is challenging and has rarely been achieved in the South African development context, where trade offs are often made by decision-makers both consciously and unconsciously. Nonetheless, it is important to realise that in order for housing development to be sustainable in South Africa, it must address poverty and the disparities in society. Without achieving sustainability in these spheres, housing development is ultimately unsustainable.

This book demonstrates that medium-density housing provides numerous opportunities to contribute to achieving sustainability if the right conditions are in place. It is critical for sustainable resource utilisation for productive, inclusive, redistributive and well-governed cities. Exploring these conditions is the motivation for the book. The case studies reveal in different ways that working with this framework for sustainability results in higher levels of community cohesion, resident satisfaction and the long term sustainability of vibrant housing environments.

3. The case for medium-density housing

Breaking New Ground (BNG), government's sustainable human settlement plan, promotes densification and integration as key objectives to “integrate previously excluded groups into the city and the benefits it offers, and to ensure the development of integrated, functional and environmentally sustainable human settlements, towns and cities”.¹⁹ A mindful move towards low-rise medium-density housing that makes efficient use of land and resources is necessary. With a commitment to meeting and understanding the needs of end users, planning and design will open up possibilities of accessibility, affordability, integration, efficiency, safety, privacy and community development.

3.1 Urban sprawl

The most predominant form of urban development in South African cities is *urban sprawl*. This manifests in the separation of activities and land uses, the suburban or township ethos, freestanding buildings surrounded by private space, inwardly-oriented neighbourhood units and the domination of the private motor car. Sprawl involves more than just low densities and is a complex and contested subject that ultimately deeply entrenches segregation. Some major disadvantages that result from low residential densities and low levels of compaction are:²⁰

- where the market is thinly spread and thresholds are insufficient (as in sprawling cities) there are detrimental effects on small-scale economic activities. Small businesses are likely to be dominated by larger enterprises that can afford higher rents;
- in sprawling systems, unit costs of social and other services are high, due to low levels of support per facility, and the range and levels of commercial and social services are low, as are convenience and equity of access to them;
- a lack of mix, diversity and overlap of activities resulting in inconvenience for urban dwellers;
- access for pedestrians is particularly problematic. Public transportation is inconvenient, inefficient and unaffordable, especially for the poor;
- an increase in the rate of land consumption and environmental degradation; and
- large plots are costly to maintain, and often become derelict and unsafe.

Rather than the creation of compact, vibrant human settlements that encompass a range of housing types and densities, and a variety of urban opportunities and activities, housing delivery in South Africa has been characterised by low density, sprawling settlements. However, this form of urban development is irreconcilable with the notion of sustainability and has been condemned recently due to its high social, economic and environmental costs, which are often hidden and are borne by the poor.

The cost of providing adequate infrastructure, roads and services has become unaffordable and unsustainable for government. The time and financial implications are severe for the large number of people located on the periphery of urban areas. These are most often vulnerable groups such as the poor and women, who must travel long distances to access urban opportunities and employment. Urban sprawl is inappropriate in the face of growing environmental concerns, the shortage of land for development, changing household profiles and family composition and the shifting nature of employment environments.

3.2 Land and property markets: excluding the poor

However, sprawl is not the only factor standing in the way of human settlements meeting the needs of all inhabitants. Growing concerns about the rapid formation of informal settlements, overcrowding in backyards and existing housing, segregation entrenched by suburbanisation and the inaccessibility of well-located land for the poor in general, make this shift towards more compact and dense settlements imperative. The struggle of access to land for the urban poor is a critical issue in post-apartheid South Africa. The operation of land and property markets excludes the poor and exacerbates existing inequalities and is in contravention of legislation that protects the right of the poor to adequate housing. Government needs to intervene in the land and property markets to ensure that they work for the poor and increase the provision of higher-density housing in strategic locations.

3.3 Meaningful change in urban form and function

The provision of freestanding freehold houses cannot be sustained and there is a need for end-users and society in general to change attitudes towards medium-density (and particularly rental) housing environments. Meaningful change is required in the form and function of urban environments. Attention must be paid to developing a stronger sense of community and to the needs of pedestrians, a mix of different income groups and land uses must be accommodated and consideration must be given to livelihood considerations and the eradication of poverty.

A major challenge for a developing country like South Africa is to facilitate the redistribution of wealth in order to narrow the huge economic differences between rich and poor. Human settlement projects provide various opportunities to contribute to the economic and social empowerment of civil society and to bring about physical and social integration. Sustainable housing promotes the safety and dignity of residents and results in more vibrant human settlements which meet human and environmental needs.

3.4 Community cohesion and ownership

People living in medium-density housing environments are a community by virtue of sharing spaces, housing units in close proximity to each other, and are bound by these and other common factors. This is often a source of conflict, but if the necessary attention is afforded to design details, environments have the potential for high levels of community cohesion and ownership of the shared housing environment.

It is therefore essential that government makes the necessary processes of participation and capacity building an inherent part of medium-density housing delivery, and further, that funding for these components becomes part of the housing subsidy. The majority of community representatives interviewed for the case studies emphasised the importance of providing community meeting spaces as well as office space for community leadership. They saw these as central to the functioning of the housing environment. Equally important is funding for the creation of dignified shared spaces that become important extensions ('outdoor rooms') of the already small units that accompany medium-density housing on well-located land.

3.5 An integrated approach

This implies an integrated, multi-sectoral approach where co-operation between a range of non-government role players, the private sector and government departments is crucial in the creation of a milieu that serves the widest possible range of household and community needs. Such an approach, if participatory, is more likely to yield successful results relating to social, institutional, financial, economic, environmental and physical design issues. Sustainability, as defined by Allen, must form part of all medium-density housing provision.

The development of higher-density housing should form part of an integrated approach to sustainable human settlement development. It should be pursued in a regulatory environment where the 'triple-bottom line' and developmental local government are objectives for a city as a whole.

Poverty is multi-dimensional and complex. A multi-sectoral, holistic approach to development needs is required to improve the social, economic and physical conditions of poor households and to further the agenda of sustainable development. Effective integrated urban development is underpinned by good inter-governmental relations, collaboration between key role players, and active civil society participation in urban processes, such as the formulation of municipal Integrated Development Plans (IDPs) and local economic development strategies. The availability of sufficient resources to provide a wide range of social and economic programmes, including the delivery of housing, infrastructure and facilities to address community needs, are vital components of the integrated approach. Housing policy should be expanded and the subsidy increased in all medium-density housing environments to make provision for social objectives such as recreation, social amenities and the needs of children and youth. Co-operation between the housing department and other government departments is crucial in this regard. Spatial integration rooted in access to facilities, amenities and urban opportunities is paramount.

The legacy of racial and economic inequality in South Africa makes it imperative to achieve integration between races and income groups. A mixed-income development is more likely to be sustainable than a project where poor people are doomed to 'ghettoisation'. However, real integration of very disparate income groups is difficult to achieve. The distribution of affordable housing among higher-income housing, and the design of affordable housing that is visually indistinguishable from surrounding higher-income housing are important factors in reducing perceived negative impacts on property values as well as social security.

3.6 A range of housing type and tenure alternatives

The provision of higher-density housing should form part of a mixed-use environment that encompasses a range of housing types and associated densities and tenure, as well as a variety of urban opportunities and activities. Higher-density housing provides the opportunity for higher levels of services, due to higher levels of support. The bottom line is that a range of land uses in close proximity to each other must be manifested in the planning and development of sustainable human settlements. Housing is not about the provision of a house alone, but also includes security of tenure for both rental and ownership housing. The promotion of alternatives to individual ownership is important as it allows for innovative designs (higher densities, communal spaces), while simultaneously providing some protection against downward raiding. Infill developments on small pockets of land (Springfield Terrace is located on an area smaller than a hectare) in existing areas present ideal opportunities for densification. **ST**

Innovative use of different housing typologies opens up new ways of increasing densities in the form of infill housing in urban areas. The provision of innovative medium-density housing that is able to meet the wide range of resident needs and create a unique sense of place and belonging requires a shift to performance-based planning controls. These should aim to achieve urban design, environmental performance, social, affordability and safety objectives rather than numerical restrictions on setback, height, plot ratio and density. Moreover, a range of house types and tenure will encourage social equity, as people of different income levels can interact in an environment that provides equal opportunities. It will also allow residents to move up or down the housing ladder at different stages of their lives without having to relocate.

3.7 Good location

Good location is a complex concept to define, but access to employment, transport and urban opportunities and facilities are useful indicators. Through efficient use of state and other well-located land (including infill housing in lower-density suburbs), and the use of value capture and tax mechanisms, government should ensure the provision of affordable higher-density housing on well-located land for households earning below R3,500 per month, including security of tenure in the form of both rental and ownership housing. Appropriate well-located sites in close proximity to transport, economic activities and services should be identified and 'banked' for the development of affordable medium-density housing. For the poor, location is often more important than housing quality as it directly impacts on the accessibility of urban opportunities and underpins social networks and livelihood strategies critical for survival. Greater social integration may also result from the location of low-income households on well-located land.

3.8 Sustainable design

The design of higher-density housing should give due consideration to all components of sustainability. Decisions should be rooted as far as possible in 'green' design principles and human needs. They should recognise the importance of sustainable building and construction in terms of environmental impact, affordability, end-user satisfaction and settlement quality. Energy efficiency and environmental sustainability have been explicitly addressed in very few of the medium-density housing projects discussed in this book, but given growing resource constraints (water, energy, agricultural land) this needs to change.

People are at the centre of sustainable development and therefore the pursuit of sustainability will only be successful if individuals, households or communities consciously choose to adopt the principles of

sustainable development as they manifest in medium-density housing opportunities. Ultimately, the construction sector will have to be completely transformed, from the materials used and how they are manufactured, to how development and the methods used to achieve it are viewed, and how end-users are engaged to commit to them. Developers, builders, architects and land-use planners should be involved, as should government, tenants and owners. Sustainability objectives will be achieved only if they are taken into account at all stages from design and construction to long-term use and eventual disposal and recycling.

3.9 A sustainable livelihoods approach

Unemployment and the often low levels of income among residents of government-subsidised higher-density housing necessitate the promotion of economic development and of opportunities to strengthen livelihoods as part of the planning and implementation of such developments. A livelihoods approach is based on understanding the way people make their living and recognises that there are differences within and between households in a given community. The approach enables implementing agents, together with the community, to design processes that take into consideration these differences in order for households to cope with risk and uncertainty. It recognises that households and livelihoods are constantly changing in response to shocks, stresses and seasonality.

Successful poverty reduction strategies have to address a range of issues over time, but a holistic diagnosis achievable through the livelihoods framework allows for the identification of the most strategic interventions. Moreover, a participatory, livelihoods approach to developing higher-density housing provides a useful framework for monitoring the impacts of the development initiative. This can be measured through indicators of affordability levels, livelihood sustainability, identifying unintended consequences, as well as devising meaningful interventions. Local economic development linked to livelihood assessments is a central component in the quest for redistribution. Complementary activities, co-operation and partnerships between different spheres and departments of government, the private sector and civil society produce improved living conditions, integration and diverse economic activity, resulting in empowerment of lower-income households.

3.10 Social and human capital formation, leadership and resident participation

Positive linkages exist between social and human capital formation on one hand, and developmental outcomes on the other. Everyone involved in the development of medium-density housing must place the sustained development of social and human capital at the centre of project planning at every stage of the process. Mobilising resources on the basis of trust, common norms and constructive communication, together with the prioritisation of information sharing, skills training, learning and education, will help to form networks that increase community participation, empowerment and sustainability.

The quality and extent of leadership and resident participation has a profound impact on the sustainability of a community or housing project. Part of the constitutional right to adequate housing is the right to participate in decision-making strategies and projects. Government and its agents should support the creation of active and knowledgeable leadership, so that poor communities can access their rights and resources. In this way, collective, ongoing participation in urban development policy formation and practice can be facilitated. To ensure sustainability, government and its partners should also have an informed understanding of and corresponding strategy to engage in a meaningful way with community needs and dynamics.

Participation requires time and resources. The provision of sufficient financial and human resources for meaningful and sustained community participation and capacity development should become part of government's engagement strategy and subsidy housing delivery mechanism. This needs to be developed together with the formation of appropriate platforms to engage at the local level. This includes a people-intensive engagement with communities in the planning and incremental phases of implementation (before, during and after), as well as intensive information sharing, education, capacity building and social capital formation. Social and human capital formation is at the root of sustainable communities – without

investment in people, investment in places and spaces is bound to be futile. Economic and environmental sustainability are underpinned by institutional, political and social sustainability factors, particularly strong and dependable, democratically elected leadership. This has proven to be a critical element of overall sustainability. The positive outcomes of community initiatives and projects, disputes, negotiation and decisions often depend on strong and reliable leadership.

3.11 Vulnerable groups

Vulnerable groups consist of a wide range of sub-groups with a variety of individual needs and are often at risk of poverty and destitution. The needs of women, often the caregivers of other vulnerable groups, are particularly important. Securing women's access to adequate housing is about more than just supplying physical shelter – housing is a facilitative right that allows women to enjoy other rights and basic needs like water, sanitation, electricity, health care, schools, employment and economic opportunity.

Government and implementing agents should consider the range of special needs of residents of medium-density projects and should develop integrated packages of services to address these needs in addition to housing. Design, organisational and institutional attention should be given to matters that concern them directly.

A multi-sectoral human rights approach is required where public, private, community based and non-government partnerships are able to co-operate effectively in meeting the needs of women, children, the elderly, the frail and disabled. A physical space such as a community centre in each higher-density housing development is paramount, as it will serve as the focal point of activities and initiatives that will meet the needs of everyone in the community.

3.12 Vibrant environments

There is no direct relationship between density and quality of housing. Consideration of and attention to a range of design and process factors relating to housing typology has the potential to enable vibrant and sustainable higher-density environments in well-located areas with high levels of resident satisfaction. Vibrant medium-density housing environments result from a range of higher-density housing typologies arranged carefully and creatively in relation to each other, public open spaces, the surrounding area and natural characteristics of the site. A range of different housing typologies and the creative application thereof should be used to achieve different densities and types of housing environments that meet the social, physical and economic needs of the greatest number of households.

With smaller housing units and diminished private outdoor space, the importance of shared spaces becomes increasingly important. Attention should be paid to those factors that help build a positive sense of place. These include:

- landscaping and planting;
- orientation of buildings;
- environmentally sustainable technologies and practices;
- urban design;
- safety; and
- contextual suitability.

Additional funding from government and an innovative approach to maximising limited resources will significantly alter the appearance and functioning of medium-density housing environments. This will lead to increasing levels of resident satisfaction. Some interventions require low financial investment but have major impacts.

3.13 Social housing and public rental housing

The success of settlements depends largely on the availability of a range of affordable housing options. The rental housing sector has the potential to contribute significantly towards urban renewal, restructuring of

the apartheid city, poverty alleviation and meeting critical housing needs, especially for people who work in well-located areas. However, government's choice of rental instruments (such as social housing) does not currently meet the needs of the majority of the urban population.

Social housing as it is currently operating in South Africa serves a small segment of the population, is not truly social, and is unaffordable to households with monthly incomes below R2,500. The social housing model should be revised to enable a significantly larger number of households to access affordable rental housing and to make social housing 'social'. In addition, the re-introduction of public rental housing as an opportunity to provide well-located affordable housing for low-income households would fill a crucial gap currently existing in the housing continuum.

Well-located, adequate, well-designed and well-managed public rental housing is an important collective asset that can be used by successive generations for sustainable human settlement advancement. Capacity should be built in local and provincial government to develop and manage a programme for public rental housing. In addition, government should encourage small-scale formal and informal landlords to provide adequate housing and provide the necessary regulatory frameworks, such as a landlord/tenant backyarder assistance programme.

Government policy calls for all spheres of government to ensure that housing development includes a wide range of tenure options and housing types. These include individual and collective home ownership as well as a range of rental options. Rental housing is the most widely used tenure option for medium-density housing and is especially suited to low-income households. Before deciding on tenure, government, implementing agents and households need to be aware of the advantages and disadvantages of different tenure options and of their applicability to particular community contexts and income levels. Importantly, residents need to understand their tenure type in order to exercise their rights and responsibilities, to take 'ownership' of their housing environment, and to avoid compromising the economic and social sustainability of their housing. Consumer education and capacity building of end-users in the language of their choice is vital.

3.14 Access to urban land

The land and property market excludes the poor and exacerbates existing inequality. Government needs to intervene to make it work better for the poor. A number of mechanisms should be used to support the efforts of poor communities to access urban land. Government could enter into new fiscal relationships with its citizens aimed at capturing unearned increases in land value and directing urban land development for the common good of all citizens. This could be achieved through land value taxes, land banking and land pooling/readjustment, and other mechanisms. Appropriate use of these mechanisms could potentially increase the provision of medium-density housing in strategic locations.

3.15 Partnerships

The main lesson learned from the case studies with regard to enhancing capacity for appropriate housing delivery is the importance of partnerships between the state and other role players. Additional resources for housing and urban development need to be mobilised from as many sources as possible – the state, household savings, micro-loans, international donors, the private sector and others. With support from technical and social support organisations, communities themselves can be capacitated to play an important role in both delivery and sustainability of their housing environment.

3.16 Affordability and forward planning

Affordability impacts on a wide range of factors and is in turn a function of a variety of dynamics, ultimately influencing overall sustainability of settlements and society. Affordability levels for the majority of the population are very low and render them dependent on state subsidised housing. Matching the tenure type, socio-economic profile and needs of target households with the housing product and overall settlement environment is an overriding factor in affordability.

Government must take responsibility for the performance of the entire housing market and should expedite and streamline housing development functions. Barriers and enablers influencing housing demand and supply in all sub-markets must be monitored and addressed. Mechanisms should be implemented to intervene in and rectify blockages that undermine a functioning market.

In addition to ensuring that land, property and housing markets are functional, it is important to both apply existing instruments and devise innovative new instruments for effective spatial planning and land development. Spatial Development Frameworks (SDFs), restructuring zones, zoning regulations, urban edge instruments and Integrated Development Plans (IDPs) should be focused on achieving spatial and social equity in land and property markets. This will involve developing pro-poor mechanisms for value capture from surplus values accruing from ‘boom conditions’ in the upper end of the land and property market. These mechanisms will promote densification, integration and the generation of resources for low-income residential developments on well-located land. Government needs to explore both the ‘carrot’ of incentives and ‘stick’ of legislation in implementing inclusionary housing programmes.

Social and human capacity development and resident participation are decisive factors in the provision of medium-density housing to reduce household vulnerability and ensure financial and economic sustainability. This will help realise the social, financial and economic asset value of housing. National government subsidies should include a financial component for capacity development of beneficiary communities, with an emphasis on livelihood considerations and local economic development. An integrated approach to housing and settlement development is key to affordability.

4. Characteristics of medium-density housing

The key guidelines in this book are based upon certain performance criteria, key principles, or urban qualities. *“Beneath the underbrush of particular situations and special groups, we find some common ground – fundamental criteria shared by all human users.”* This statement by Lynch and Hack²¹ illustrates that ideally an understanding should be sought of the specific end users of a particular environment, but that some generalisation about the interaction of people and place can be made. In order to remain desirable over many years, housing and urban environments must display timeless qualities that transcend the values of any particular generation or group of end users. The following table²² summarises the most significant qualities:

Table 2: Performance measures for medium-density housing environments

Balance	<ul style="list-style-type: none"> • An over-arching quality that embraces all other qualities. • Encompasses the quality of ‘sense of place’ (“how we perceive an image and feel”²³), acknowledging natural, cultural, social, historical and spatial distinctiveness of a certain place or time. • Balance in the interaction between people is evident in the way in which spaces, places, channels of movement and institutions contribute positively to the interactions between people.
Integration	<ul style="list-style-type: none"> • Integration of processes, institutional and urban management arrangements, role players and stakeholders, various sectors, and physical aspects that contribute towards the creation of medium-density housing environments. • Different parts and elements must be integrated to ensure optimum performance and satisfaction of needs. • Medium density allows for a greater range of opportunities and facilities to be generated with increasing agglomeration. • In positively performing medium-density housing environments, poorer residents have access to opportunities and facilities generated by the wealthy.

Freedom	<ul style="list-style-type: none"> • Encourages and supports the highest degree of freedom for individuals to act in a medium-density environment. • High degrees of freedom are achieved through provision of stimulating, complex and diverse environments: medium-density housing units close to employment opportunities, adequate public facilities, safe and efficient public transportation, safe recreation areas and usable open space and meeting places.
Equity	<ul style="list-style-type: none"> • Enhances and promotes urban activities and processes of urban life. • Through affordable, well-located medium-density housing, low-income citizens are also allowed easy access to urban opportunities.
Intensity, diversity and complexity	<ul style="list-style-type: none"> • Densification and compaction are vital preconditions for high performance urban environments that provide the necessary complexity, diversity and intensity. • Presenting diverse opportunities over a relatively short distance, with high population thresholds created by medium-density housing to support urban activities and opportunities. • Urban dwellers are able to exercise real choice when they can choose to live in high-intensity environments without completely sacrificing access to privacy, quiet and nature, or in lower-intensity environments without totally sacrificing access to the benefits of urbanity, that is, high levels of service, opportunity, convenience and interaction.
Densification and compaction	<ul style="list-style-type: none"> • Compact urban environments offer higher levels of support per facility, thereby reducing unit costs of social and other services. • They offer greater range and higher levels of social and commercial services, with more equitable and convenient access to them, particularly for pedestrians. • Public transportation is more viable in higher-density than in sprawling environments. • Places of economic opportunity are more widespread, which benefits small economic enterprises. • Greater diversification and specialisation occur, as agglomeration and scale economies stimulate the generations of new economic opportunities. • In order to limit sprawl “people should have the freedom to choose between ranges of intensity, convenience and arcadianess, but only within limits defined by the good of the overall system. The critical issue in this regard is not maximum densities, but the achievement of minimum densities sufficient to support public transportation and basic services within a range defined by movement on foot. This restriction offers not less, but more freedom”.²⁴
Community	<ul style="list-style-type: none"> • Community is a complex issue relating to a sense of identity and belonging. • There is no simple correlation between community and space/territory. • Primary places where interaction and communication occur are vital – they affect processes of urban socialisation, people’s sense of identity and richness of urban experience. • All needs cannot be met at household level: communal spaces provide experiences and opportunities. • Supports social ties in medium-density housing environments. • Complex social and cultural fabric should find freedom of expression in the built environment – not reflecting imposition of uniform values.

Sustainability	<ul style="list-style-type: none"> • Sustainable development encompasses interdependent and mutually reinforcing pillars – economic, social and environmental, physical and political. • It relates to balancing the need for economic and social development so that society, its members and its economies are able to meet their needs and express their greatest potential in the present, while preserving biodiversity and natural ecosystems, and planning and acting to maintain these ideals in a very long term.²⁵ • It should be a central guiding principle of government and private institutions, organisations and enterprises, as the declining state of the human environment and natural resources has negative implications for economic and social development.²⁶
Urban generation	<ul style="list-style-type: none"> • A medium-density environment sufficiently meets the needs of its inhabitants if it generates and creates necessary pre-conditions for economic, social, cultural and recreational opportunities and facilities. • This is achieved through the agglomeration of people, and the way the urban environment is structured.
Access	<ul style="list-style-type: none"> • Refers to both spatial and a-spatial aspects. • Spatially, access should be maximised through the availability of opportunities and facilities within walking distance of medium-density housing or the vicinity of an efficient and co-ordinated public transportation system. • A-spatial barriers (economic, social, political, regulatory, attitudinal and others) need to be broken down to allow people to maximise the benefits provided by medium-density housing. • To ensure equity, existing opportunities and facilities (to sustain livelihoods, for example) must be accessible to the majority (often the poorest) of the urban population.
Promotion of collective activities and contact	<ul style="list-style-type: none"> • Places where formal and informal interaction and communication take place usually offer the widest range of opportunities. Attention should be given to the provision of these spaces in medium-density housing environments. • Emphasis should be placed on the collective activities and social networks provided as part of medium-density developments as they impact significantly on residents' quality of life.
Individual need	<ul style="list-style-type: none"> • Pre-conditions to meet individual needs such as physical, social, psychological and sensory needs must result in freedom of choice and action for residents to engage constructively in their housing environment.

Endnotes

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