

Hildebrand Frey

Urbanising Suburbia The Handbook

**Establishing threshold, average and target values of
sustainable urban quarters**

Preface

The project *Urbanising Suburbia*, the responsibility of the University of Strathclyde's Urban Design Studies Unit (UDSU) at the Department of Architecture, was part of the investigation of the *CityForm (Sustainable Urban Form) Consortium* funded by the Engineering and Physical Science Research Council (EPSRC) under its Sustainable Urban Environments Programme (Grant number GR/520529/01).

The Consortium comprised a multi-disciplinary team based at the Universities of De Montfort, Heriot-Watt, Oxford Brookes, Sheffield and Strathclyde. The key task of the core research was to investigate to what extent and in what way urban forms impact social, environmental, ecological and transport sustainability. Information on the consortium's work is available on the *CityForm* page, www.city-form.org.uk.

Urbanising Suburbia was one of the satellite projects. It examined ways in which (sub)urban areas – housing developments, often, but not always, at the city fringes considered to be unsustainable due to their low population and dwelling densities and their lack of local amenities – can be transformed into become more sustainable settlements.

The research team members and their responsibilities were as follows:

- **Hildebrand Frey**, retired Senior Lecturer and Director of UDSU at the Department of Architecture, University of Strathclyde; *CityForm* Co-Investigator
He held overall responsibility for the project, but specifically for the development of a *Tool* with the help of which levels of sustainability of urban areas can be assessed on the basis of threshold, average and target values of sustainable urban form. He was also responsible for the application of the *Tool* in a number of theoretical and concrete urban regeneration and development projects to measure their performance values and, based on this, formulate regeneration programmes.
- **Samer Bagaen**, Research Associate April 2004 to October 2006
He carried out the review of all relevant literature and related research projects; area surveys, including land and building uses, built form, transport infrastructure; processing and mapping of primary data (survey data of case study areas) and secondary data (the Valuation Roll, Census Statistics and information provided by the Glasgow City Council) using MapInfo and ArcGIS.
- **Charalampos Giachis**, Research Associate November to December 2006
He generated a base map and a three-dimensional model of the existing conditions of Glasgow's Greater Govan area, using a number of software packages.
- **Pedro Faria**, Research Associate June to September 2007
He developed three dimensional models of three neighbourhood areas of Govan as existing and as proposed, following the regeneration programmes based on the comparison of the areas' existing (largely 2001) values with the threshold and target values generated for the *Tool*.

The research was informally supported by the Glasgow City Council Department of Regeneration Services (DRS) that specifically influenced the choice and investigation of Glaswegian urban areas on either side of the central River Clyde corridor, specifically the areas of Glasgow-Govan. The research team has generated a number of publications and has presented its work and findings at a number of occasions; details can be found on the *CityForm* web page www.city-form.org/uk/publications_plus.html. However, at no stage during the development of the project has

it been possible to present a holistic summary of the research objectives, the theoretical and methodological underpinning of the project, the *Tool* and its underlying target and threshold values, the application of the *Tool* in specifically selected case studies in Glasgow and the other four Consortium cities as well as a number of best practice cases, and the assessment of the *Tool's* viability and usefulness for the systematic development of regeneration programmes. To present such an overview is the purpose of two parallel documents, the *Summary Report* and *The Handbook*.

Hildebrand Frey (June 2010) *Urbanising Suburbia: Summary Report on Research Project*

The paper presents an overview of all stages of the project including its application in selected urban areas and the achievements and problems that were encountered in this process.

Hildebrand Frey (June 2010) *Urbanising Suburbia: The Handbook – establishing threshold, average and target values for sustainable urban quarters*

This parallel document in hand explains in some detail how the target and threshold values were formulated, what sources of research projects, publications, and best practice cases they are based on and what arguments lead to their adoption.

Introduction

This document explains in some detail how the target and threshold values of sustainable urban quarters were formulated and for what reasons. It explains the focus of this project on strategic urban form characteristics that are important for the planning and conception stages of urban development and regeneration projects. It argues that the city in its physical manifestation is a construct of urban quarters as its smallest building blocks (urban quarters are defined in Chapter 2). It suggests that any smaller-scale investigation of urban development has to take place within a strategic framework of an urban quarter just as any larger-scale strategic framework for an urban district, town, city or city region has to make reference to their modular structure at urban quarter level. It then documents the process of establishing target, average and threshold values for the three key sustainability indicator categories investigated in this research project: the strategically important built form, social and socio-economic characteristics, and key environmental characteristics of sustainable urban quarters that need to be considered in the strategic stage of planning and conception.

The *Handbook* also discusses the need to consider a prioritisation of indicators and values based on local conditions. Although all characteristics are essential to attain sustainability, prioritisation allows the community of an urban quarter to focus on achievable characteristics of sustainability and allow, under current conditions and constraints, less achievable characteristics to be compromised.

The *Handbook* furthermore reiterates that currently only very few urban values are supported by strong empirical evidence as only very few research groups have to date focused on, and succeeded in establishing, such evidence. The *Handbook* argues that it is undesirable to operate without any 'predefined values' as this would result in the continuation of the current approach of establishing 'negotiated values' that are temporarily important only for those who are part of that negotiation (mostly the leaders in urban development such as the planning authorities, investors and developers and other powerful stakeholders). The weaker members are frequently excluded from negotiations or only informed about the outcome of the negotiations by the leaders paying lip service to a 'participatory approach'. But even when participation is taken more seriously, those representatives of communities and other groups of interests involved in the process are hardly ever representative of the community at large and tend to pursue their personal or their group's interests, leaving unrepresented the needs and aspirations of other individuals and groups, and excluding those targets that need to be pursued to achieve sustainable urban development.

To conclude, the *Tool* has to be understood as a working instrument that must be adaptable to changing socio-economic conditions, needs and aspirations on the one hand and to new perceptions of characteristics and values of sustainable urban development on the other. The *Tool* suggests target and threshold values on the basis of the best arguments on sustainable urban development currently available that need to be upgraded or replaced as soon as further research, through investigations of best practice cases based on sustainability indicators and goals, come up with values that are more strongly underpinned by empirical evidence. It is furthermore evident that social and economic conditions differ widely even within one urban area or neighbourhood and certainly in different parts of the UK, and that target and threshold values need to reflect these local or regional conditions. In the *Handbook*, many of the proposed targets reflect the specific urban conditions in Glasgow or Scotland to support the investigation of the Glasgow Govan areas presented in the *Summary Report*; they need to be adjusted to local conditions elsewhere. The *Handbook* gives advice when such adjustments need to be made.

Acknowledgements

I would like to thank the Vauban Office at the Building Department of the City of Freiburg im Breisgau for valuable information on the planning framework for the urban quarters Vauban and Rieselfeld and for the provision of land use data of Vauban. Without your help I would not have found it easy to understand the motives behind and concepts for these inspiring urban quarters.

Apologies

I wish to apologise for the late publication of the two reports *Final Report* and *The Handbook* on the *Urbanising Suburbia* Research project. The enormous delay is due to family problems and bereavements that made it extremely difficult for me to concentrate on academic work after retiring in 2006. This made it also difficult to update information on the Freiburg Vauban and Rieselfeld case studies and to edit the reports.

Apologies to the readers for any mistakes that may have crept into the reports or have not been ironed out.

Apologies to the Vauban Office in case of any misinterpretations of the information and data you provided for me; should you have any misgivings, let me know and I will make the necessary corrections and changes.

Apologies to my late cousin Charles who in his darkest hours wanted me to stop work on the reports altogether and was sad that I could not promise him to do so.

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Chapter 1

The range of investigation of sustainability indicators and target values for urban areas

The key task of this chapter is to select appropriate sustainability indicators for urban development and regeneration and establish for each of them qualitative and quantitative values that are suggested to render urban areas sustainable. These indicators and values will be the most important element of a *Tool* with the help of which levels of sustainability of urban areas can be systematically measured and assessed.

Due to limitations in terms of time and resources this project focuses on the planning and conception stages of urban development and regeneration. Accordingly, only threshold and target values for indicators of sustainable development relevant to these two stages are derived from available sources. Indicators and values relevant for the design stage (such as the creation of high-quality urban form and spaces, high quality affordable housing), construction stage (choice of technology, materials and support systems / infrastructure) and post-occupancy stage (evaluation of the actual performance values of recently developed or regenerated urban areas and feedback from inhabitants and users of these areas) need to be established in live cases of regeneration projects way beyond the framework of this research.¹

The relevant key indicators for the planning and conception stages of urban regeneration are those concerned with the operational, social, economic and environmental/ecological viability of urban areas which in turn generate the quality of life for those who live and work there. The threshold, average and target values are therefore largely quantitative as no actual design is yet generated except for the strategic investigation of available or potential urban quarters and their linkages to other urban areas. There are 3 categories of sustainability indicators for which ‘threshold’ (minimum), ‘target’ (optimum) and occasionally ‘average’ values² are formulated:

Built form characteristics of sustainable urban quarters entail values for

- the size the urban quarter’s population;
- the required local services and facilities;
- the size, area, population and dwelling density of a walkable urban quarter;
- graded densities from edge to centre of the urban quarter;

¹ The limitation of this research to strategic issues of the planning and conception stage of urban regeneration should not be a problem for potential users of the *Tool* developed here. Issues of the design of urban quarters have been covered in great detail by a considerable number of publications, among them Bentley et al. *Responsive Environments – a manual for designers*, the English Partnerships *Urban Design Compendium*, and Barton et al. *Shaping Neighbourhoods* which covers the planning, conception and design stages of urban development and regeneration. There are also a great deal of publications on sustainable construction and there are reports from the ongoing Millennium Villages Programme set up by the then Secretary of the Environment John Prescott and the Millennium Communities Programme set up by English Partnerships in conjunction with the Office of the Deputy Prime Minister. However, hardly any of the available *Tools* for sustainable development cover the strategic stages of planning and conception of urban area regeneration and intensification completely in the sense that many values of urban areas are only verbally described but not quantified. This project sets out to fill the gaps, expand the list of indicators and derive threshold, average and target values for them.

² The reason why minimum, average and optimum values are formulated is that not all urban areas in specific urban, political, social and economic contexts and in varied geographical and topographical conditions can be expected to have the potential of achieving optimum values. Average and minimum (threshold) values represent fallback positions in case of optimum values being unachievable. A further way of adapting to local needs and constraints is by prioritising indicators and values as will be discussed later. The application of target, average and threshold values and their prioritisation is described in the *Summary Report*.

- graded densities from edge to centre of the town and city to achieve a sound mixture of development forms that suit a range of socio-economic conditions.

Social characteristics of sustainable and socially inclusive urban quarters entail values for

- a balanced population age profile;
- a balanced mix of dwelling types as well as household types and sizes;
- a balanced mix of tenure types;
- a balanced profile of qualifications of people of working age as a sub-indicator of the social and economic balance or imbalance of urban quarters;
- balanced health conditions and deprivation indicators in urban quarters.

Socio-economic characteristics of sustainable urban quarters entail values for

- a balance of economically active and inactive persons in urban quarters; and
- a balanced range of property prizes and rent levels as key to socially inclusive urban quarters.

Environmental/ecological characteristics of sustainable urban quarters

Due to time and resource restrictions, the investigation of environmental and ecological concepts and values had to be excluded, important as they are. However, the document *Urbanising Suburbia – Final Report* includes in chapter 5 the investigation of one of the best practice cases studied by the research team, the urban quarter Vauban at Freiburg im Breisgau, Germany. The Vauban project team of the City of Freiburg's Building Department has developed a planning framework based on sustainability indicators and target values that include a number of important ecological concepts:

- Ecological energy concepts;
- Ecological transport/mobility concepts;
- Ecological sewer, waste water and rainwater concepts;
- Ecological landscaping.

In the *Final Report* these concepts are described and their effects on the urban quarter are illustrated.

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- The City of Freiburg, Building Department, Vauban Office, Fehrenbachallee 12, D 7916 Freiburg im Breisgau. Germany. [online] <http://www.quarties-vauban.de/Mail:veithro@stadt.freiburg.de>

Chapter 2

The urban quarter as building block of urban districts, towns and cities

Threshold, average and target values should be formulated as properties of a specific 'urban entity' such as the city or town, individual districts of the city, or what are normally called 'neighbourhoods' or 'urban villages'. The choice of area for which such values are formulated depends on the three major demands that are made on the city and its constituent parts: accessibility, proximity, and functional mix (Ciuffini 1995, p.viii; Frey 1999, p.38). To reduce the need to travel and increase accessibility for people who are less mobile requires that local workplaces, services and facilities and other amenities are accessible on foot. This necessitates their proximity to people's homes and accordingly a degree of functional mix in the targeted area. To reduce car dependent travel, the city's district and central facilities and workplaces have to be accessible by public transport. This in turn necessitates access to public transport stops from people's homes and workplaces on foot. The research team has decided to call the smallest urban spatial unit or module 'urban quarter'³ (compare Frey, H. 1999, chapter 3 and Figure 3-01).

As a consequence of demands for accessibility, proximity and functional mix, traditional towns and cities have a modular structure of urban quarters that are often synonymous with 'guild quarters' or 'parishes'. The Merchant City of Venice, for instance, was developed as an agglomeration of guild quarters that are physically separated by canals but linked by major pedestrian routes; each of these quarters has a (not necessarily geographically) 'central' square with a church, a guild house, a fountain, educational and entertainment facilities, shops and a market. This organisation of Venice enabled the residents of urban quarters to have access to all local services and facilities on foot and gives the city still today a memorable structure. In the 14th and 15th century, Florence has also the structure of urban quarters and parishes, but spatially they are not as clearly separated from each other as those in Venice and overlap. London, as seen from the dome of St Paul's, is often described as an agglomeration of 'villages' with parish churches marking their location. In our suburbs and urban fringe areas such a modular structure based on urban quarters has been lost or has never developed. As a result, in such suburbs or fringe areas one of the most valuable characteristics of 'urban villages', the possibility of inhabitants to meet people in the streets for casual exchanges while on the way to local shops or other facilities, cannot develop because there are no local amenities and because people consequently do not walk in the streets as there is nothing to walk to.

One of the first who, for that very reason, fiercely advocated for the preservation of neighbourhoods like Greenwich Village in New York or the North End of Boston was Jane Jacobs. She described the key physical conditions necessary for dynamic city life: multifunctional neighbourhoods, short urban blocks and connected streets, residential areas of varied age, and a high concentration of people (Jacobs, J., 1961). Sociologists like Bell and Newby (1978) dismissed neighbourhood planning. In their judgement the role of a local basis of human interrelationships is overstressed. Indeed, many

³ Ciuffini calls it 'urban cell' or 'proximity unit' (Ciuffini 1995:xix and 29-40). The connotation of 'urban cell' with biological entities is somewhat disturbing because the urban quarter as physical entity does not grow on its own but is built by people; to call it 'proximity unit' omits to a degree the other demanded characteristics of the unit, accessibility and functional mix. In the UK, this unit is often called 'neighbourhood' although today its inhabitants do not necessarily form any social bonds. In France, the unit is called 'quartier', which is the most meaningful term to classify an urban living and working area of a specific socio-economic and/or physical identity. Despite the fact that the translation of 'quartier' into 'quarter' does not get anywhere near the meaning of the French term the team decided to use it even though only one of 25 different meanings listed in the Encarta World English Dictionary is that of an area in a town. To make it absolutely clear what is meant the expression 'urban quarter' is used.

neighbourhoods of 1960s new towns in the UK have not developed strong social ties or true communities. For the research team the urban quarter is first of all a 'convenience unit' that provides access to amenities and public transport. The availability of local amenities, however, provides the opportunity of local interaction, casual meetings of people in streets, shops and the market. Herbert and Thomas ([1990]1991) point at a rebirth of localism with the emergence of groups seeking some political decentralisation. 'Neighbourhood associations and community councils have expanded in the 1980s and locality-based action groups have responded rigorously to urban environmental issues' (ibid. p.272). A fitting example of this is the urban quarter Vauban at Freiburg im Breisgau, Germany, investigated in the *Summary Report*.

Today many urban theorists support the concept of the organisation of the city, at least its physical manifestation, as a construct based on urban quarters for a number of reasons.

- First, an urban quarter has a sufficiently large and socio-economically sufficiently mixed population to bring all cultural, political, social and economic values and activities into play that are the trademarks of the city at large. The urban quarter is therefore a micro model of the city with built form, social and economic characteristics similar to those of the city.
- Secondly, as a result of its similarity to the city, an urban quarter is in socio-economic terms a functional unit with rather similar characteristics compared with those of the city at large: it accommodates (or potentially accommodates) local services and facilities providing for the day-to-day needs of residents. The facilities are accessible on foot, a characteristic that is specifically valuable for those less mobile – mothers with young children, elderly or disabled people – but potentially also helps to reduce the necessity to travel to places outside the urban quarter in order to provide for daily needs. The final report of the Urban Task Force *Towards an Urban Renaissance* has adopted the 'neighbourhood' as the smallest building block of the town or city, clustering to form urban districts that themselves cluster to form towns which in turn cluster to form cities (Urban Task Force 1999, p.53). Although the hierarchical structure this generates is useful it cannot be expected to be fully achievable in existing cities and conurbations due to the almost random patterns of settlements the processes of urbanisation and decentralisation have generated (compare Frey, H. 1999, chapter 3 and Figures 3-08 to 3-11).
- Thirdly, an urban quarter is (or is potentially) an imageable urban unit specifically if it has a focal point that generates a sense of place and centrality. The imageability of the city depends, therefore, not only on its central, usually historical core, but also on the way in which urban quarters are interconnected and compose the city network.

Threshold, average and target values are accordingly formulated for urban quarters in the understanding that, if these quarters work efficiently and sustainably as identifiable and imageable places that provide their population with amenities for daily needs and workplaces, then a town or city formed by clusters of such quarters is also likely to work efficiently and sustainably as identifiable and imageable place (compare Lynch [1960] 1986, p.112). The *Handbook* starts the investigation with urban quarters located at the edge of the city, as it pursues a keen interest in urbanising suburbia. It will later investigate how target, average and threshold values change for urban quarters in more central locations. For those interested in the concept of the urban quarter as building block of the city, a more detailed discussion of the notion of the city as modular construct is given in the *Summary Report*.

References

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Chapter 3

Built form characteristics of a sustainable urban quarter

If today, as is likely, social ties are least effective in the formation of urban quarters, then their operational logic may have much to do with the scale of economics in terms of the viability of services and facilities as well as public transport. This means that the size of the population of an urban quarter, in conjunction with the population's socio-economic profile, support or deny viable local amenities. Threshold, average and target values for key indicators of well-functioning and socio-economically balanced urban quarters are therefore investigated in this chapter. The urban area assessment *Tool* that is developed in this research project will be predominantly tested in urban areas of Glasgow. For that reason values are largely based the Census 2001 data of Scotland's General Register Office (GRO (Scotland) Census 2001). The format deviates somewhat from that used in England, Wales and Northern Ireland. Nevertheless, comparisons are made with other areas of the UK not least to show the considerable differences of value expectations and averages.

3.1 The required population to sustain local services and facilities and public transport

The key issues that are now further investigated are access to amenities and sustainable mobility. There are two objectives.

- The first is to enable all inhabitants of an urban quarter accessing local amenities on foot. This would be especially valuable for those in the community who are not highly mobile (the elderly, disabled people, young mothers with small children, households without a car) but might also encourage the highly mobile inhabitants to avoid using the car inside the urban quarter.
- The second is to enable all inhabitants of an urban quarter accessing higher level amenities provided in district, town and city centre core areas using public transport; this would again be specifically valuable for the less mobile in the community, but might also encourage the more mobile inhabitants to become partners in a Park and Ride system by leaving the car at home (or in community car parks at the edge of their urban quarter) and using public transport throughout the city.

A good example of the response to both objectives is the mobility concept of the urban quarter Vauban at Freiburg im Breisgau, Germany, discussed in the *Summary Report*. The pursuit of these objectives helps generate traffic-calmed urban quarters and reduce road congestion and pollution exported from suburbs to more central areas of the city.

The assessment of the size of an urban quarter's target population is based on the catchment population required to sustain local services and facilities and public transport. The population size that would support local amenities is often said to be 4,000 to 10,000 people but the lower figure is likely to support only a small number of services and will not support a viable bus route connecting the urban quarter with other areas and district, town and city provision centres whereas the upper figure may be too small for urban quarters located in more central areas of the city. It is therefore essential to establish more accurately the required population for urban quarters in edge, intermediate and centre locations. The Urban Task Force states that '... about 7,500 people might support a viable local hub of facilities' which are shown with their catchment population in Table 3.01 (Urban Task Force 1999, p.61). To present a complete picture, the amenities located in district, town and city core areas with increasing catchment population and travel distances are listed as well.

It is clear that the hierarchical structure of nodes for the provision of services and facilities needs to be paralleled by a hierarchy of public transport systems to provide easy access, for instance walking from home to local amenities located in the urban quarter's central area, using a bus to get from there to district centres and changing to a LRT system or a higher-capacity bus network to get from there to town and city centre and beyond. The Urban Task Force illustrates this in Figure 2.1 and Figure 2.5 of its final report (ibid., p.53 and p.61).

An average population of 7,500 is seen by the Urban Task Force to be the size of a typical neighbourhood (ibid., p.60). This population size is also considered to be the threshold for an urban quarter to support a good bus service, given a gross development density of 100 persons per ha and a socially mixed population (ibid., p.61). In order to change suburbs into sustainable urban quarters they ought to have the amenities and the supporting target population listed in Table 3.01.

Table 3.01 Services and facility of urban quarter, district, town and city core areas, indicative catchment population and travel distances

amenities	distance	target amenities	source
Access to local hub amenities	150-250 m walk	Primary school (1 shared by 2 hubs) Medical surgery Corner shop Nursery school Community park Playground	Urban Task Force (UTF) 1999, p.31; Research Team
Access to urban quarter amenities	400-600 m walk	Public house / inn / café Group of shops / convenience store Post office Community office Community centre and square Access to public transport stop Youth meeting place Adventure playground Sports fields (football, volleyball etc.)	UTF 1999, p.31; Barton et al. 2003, pp.96-9; Research Team
		Connectivity to other urban quarters, district, town and city centres and beyond A permeable internal street network, all streets connected	
Access to district amenities	1,500 m	Secondary school Playing fields	Barton et al. 2003, pp.96-9 Research Team
	2,000 m	District Centre Superstore / larger shops Leisure Centre Natural green space Integrated public transport system	
		Health centre Library Sports centre	
Access to town amenities	5,000 m	Cultural / entertainment. centre Higher education General hospital Integrated public transport system	UTF 1999, p.31, Research Team
Access to city amenities	up to 20 km	Stadium Cathedral City Hall Key museums Major theatre + public facilities University Regional exhibition centre Integrated public transport system	

Box 1 summarises the target population size of an urban quarter located near or at the edge of the city and the local hub and urban quarter amenities listed in Table 3.01 that all urban quarters ought to have regardless of their location in the city. The box suggests that the target population of urban quarters in intermediate and

central locations is likely to be larger than 7,500. The box also suggests that the support of local amenities is not only a function of the population size of the urban quarter but also of the socio-economic profile of its population and the density of its development. These are issues that are further investigated in subsequent sections of this chapter.

BOX 1	
Indicator group 1	Built form characteristics of sustainable urban quarters
Indicator	The required population of the urban quarter at town/city edge location
Comments	<p>The population size of urban quarters at or near the edge of towns and cities is considered to sustain the local services and facilities specified in Table 3.01, including public transport (e.g. a bus service), if the following conditions are met:</p> <ul style="list-style-type: none"> • people are able to access local amenities and public transport stops on foot and district, town and city amenities as specified in Table 3.01 using public transport (e.g. LRT or higher-capacity bus system); • the population is socially mixed (as specified under the indicator groups 2 and 3, social and socio-economic characteristics); • the net population and dwelling densities correspond, at the least, with the threshold densities specified in Box 2.
Generally valid target value	The target population of any urban quarter at the town/city edge location should be 7,500
Location, city or region-specific target value	<p>Although for all urban quarters at the town/city edge location the target population of 7,500 is generally valid, the net population and dwelling densities within an urban quarter are likely to vary depending on the location of housing, whether closer to the urban quarter's edge or centre, to generate a variety of housing types that cater for households with different socio-economic profiles and lifestyles (see Box 3a).</p> <p>Furthermore, the population of urban quarters located closer to the centre of an urban district, town or city may be as large as 10,000 or more to allow for a variety of built form characteristics and their corresponding socio-economic population profiles within a town and city (see Box 3b).</p>

3.2 The size, area and the gross and net population and dwelling densities of a walkable urban quarter at city edge location

The key constraints with regard to the accessibility of local services and facilities are the walking distance between the edge of the urban quarter and centrally located services and facilities on the one hand, and the maximum time people are prepared to walk on the other. There is general agreement that the maximum walking time to access amenities is 10 minutes, but there are some discrepancies regarding the walking speed. According to the Urban Task Force, a 5-minute walk covers 500m (Urban Task Force 1999, p.60). This walking speed is equivalent to a distance of 4 miles or 6 km per hour, which About.com classifies as 'moderate to brisk walk' (About.com). Barton et al. suggest that the average walking speed is 1.4m per second (Barton et al. 2003, p.119), which About.com classifies as 'easy health walk around the neighbourhood', and a 5-minute walk covers 400m, a 10-minute walk 800m. Considering that there is a difference between walking on level or sloping ground and considering elderly people and young mothers with little children, a speed of 2 to 2.5 miles or 3.2 to 4 km per hour, classified by About.com as 'tracking your daily step', seems more appropriate. A 10-minute walk would accordingly cover between 530 and 670m, with an average distance of 600m. Regarding the size, gross and net population densities and the net dwelling density of an urban quarter, three scenarios are accordingly thinkable. (Tables 3.02, 3.03 and 3.04).

Table 3.02 The best urban quarter scenario at edge location: target values for a population of 7,500⁴

Distance edge to centre	530 m		Close to the UTF optimum 540 m (p.61)
Total area	88 ha	100%	
Mixed-use land	35 ha	40% ⁵	Communal uses, workplaces & main access roads
Housing land	53 ha	60%	Incl. local roads
Gross population density	85 ppha		Persons per ha over total area
Net population density	141 ppha		Persons per ha over housing land
Net dwelling density	67 dpha		Dwellings per ha, average household size 2.1 persons (Glasgow average)
	64 dpha		Dwellings per ha, average household size 2.2 pers. (UTF average; Barton et al. 2003, pp.201-3)

Scales: ppha persons per hectare
dpha dwellings per hectare

Table 3.03 The average urban quarter scenario: average values for a population of 7,500⁴

Distance edge to centre	600 m		Close to UTF 1999, p.61, average 610 m
Total area	113 ha	100%	
Mixed-use land	45 ha	40%	Incl. communal uses + main access roads
Housing land	68 ha	60%	Incl. local access roads
Gross population density	66 ppha		Persons per ha over total area
Net population density	110 ppha		Persons per ha over housing land
Net dwelling density	52 dpha		Dwellings per ha, average household size 2.1 persons (Glasgow average)
	50 dpha		Dwellings per ha, average household size 2.2 pers. (UTF average; Barton 2003:201-3)

Scales: ppha persons per hectare
dpha dwellings per hectare

Table 3.04 The worst urban quarter scenario: threshold values

Distance edge to centre	670 m		Close to UTF 1999 p.61, worst 780 m
Total area	140 ha	100%	
Mixed-use land	56 ha	40%	Incl. communal uses + main access
Housing land	84 ha	60%	Incl. local access roads
Gross population density	54 ppha		Persons per ha over total area
Net population density	90 ppha		Persons per ha over housing land
Net dwelling density	43 dpha		Dwellings per ha, average household size 2.1 pers. (Glasgow average)
	41 dpha		Dwellings per ha, average household size 2.2 pers. (UTF average; Barton 2003, pp.201-3)

Scales: ppha persons per hectare
dpha dwellings per hectare

It is now possible to compare these values. To facilitate the comparison of values, a table is arranged to show comparable values next to each other (Table 3.05).

^{4,5} In this project 40% of an urban quarter's total area is dedicated to a mixture of uses such as housing, communal spaces, services and facilities, workshops and other non-housing uses, including main vehicular access roads. This percentage is based on studies of the land use patterns of best practice urban quarters with the size of their mixed-use areas ranging around 40% of their total area; for instance, the housing land of the urban quarter Vauban at Freiburg, Germany, is 61.49%, that of the mixed-use land 38.60% of the total area (Data from the Freiburg Planning Department). The Urban Task Force suggests for a population of 7,500 people a communal area of 42ha without specifying what uses this communal area accommodates (Urban Task Force 1999, p.61). This area is 7ha larger than the mixed-use land in the best urban quarter scenario (Table 3.02) whereas the average and worst urban quarter scenarios provide a mixed-use land of the size equivalent to that recommended by the Urban Task Force for a population of 9,000 and 10,500 respectively (Tables 3.03 and 3.04). When discussing graded densities of urban quarters located around district, town and city centres, the question of the size of the mixed-use land needs to be returned to (see section 3.4, Table 3.07).

Table 3.05 Comparison of size, population and dwelling densities of urban quarters at city edge location with a population of 7,500

	Scenario 1 (best)		Scenario 2 (average)		Scenario 3 (worst)	
Distance edge - centre	530 m	100%	600 m	+13.0%	670 m	+26.0%
Total development land ⁶	88 ha	100%	113 ha	+28.4%	140 ha	+59.1%
Mixed-use area (40%)	35 ha		45 ha		56 ha	
Housing area (60%)	53 ha		68 ha		84 ha	
Gross population density	85 ppha	100%	66 ppha	-22.0%	54 ppha	-37.0%
Gross area per person	117.33 m ² pp		150.66 m ² pp	+28.4%	186.66 m ² pp	+59.1%
Net population density	140 ppha	100%	110 ppha	-21.0%	90 ppha	-36.0%
Net area per person	70.66 m ² pp		90.66 m ² pp	+28.3%	112.00 m ² pp	+58.5%
Net dwelling density, 2.1 pph (Glasgow 2001 average)	67 dpha	100%	52 dpha	-22.0%	43 dpha	-36.0%
Net dwelling density 2.2 pph (UTFR, Barton et al)	64 dpha	100%	50 dpha	-22.0%	41 dpha	-36.0%

Scales: ppha persons per hectare
m²pp square metres per person
pphh persons per household
dpha dwellings per hectare

It is obvious that with growing distance edge to centre the total area, the gross area per person and the net area per person of an urban quarter grow exponentially. For the Urban Task Force's worst scenario with a 780m distance edge to centre the area is 2.17 times that of the best scenario. This shows that the lower the density more and more land is needed, but conversely that less and less land is saved the higher the density gets. There is an additional reason for the smaller reduction of land at higher densities which is pointed out by Barton et al.: 'Beyond 60 or 70 dph [dwellings per hectare], studies suggest land savings are not very great because the land-take of other uses such as schools and parks goes up in proportion to population.' They conclude that densities higher than 70 dpha are only beneficial in city, town or district centre areas 'where high land values justify the more complex infrastructure costs' (Barton et al. 2003, p.202). The range of values is comparable with recommendations by the Urban Task Force (1999, p.61). Earlier suggestions of the Urban Task Force and the call for a target range of 30-50 dpha in Planning Policy Guidance Note 3 on Housing (DETR 2000) seem to have had an impact on new-build densities: the average between 1996-2001 was 25 dpha; according to statistics published by the ODPM (2001-02) the average density of new-build houses on greenfield sites is 39 dpha and on brownfield sites 44 dpha, and the average density of new-build homes in London is 73 dpha. This confirms that Scenario 3 values are almost today's standards of development and therefore threshold values. This coincides with an investigation of the Department of the Environment in 1992 into the viability of Combined Heat and Power (CHP) which requires a threshold residential density of 44 dpha or about 100 ppha (quoted from Barton et al. 2003, p.200).

Box 2 summarises the set of data for the best, average and worst urban quarter scenarios at city edge location. These are the values on which all other investigations are based.

⁶ It is important to note that the total development land referred to here comprises housing land, mixed-use land (services and facilities, workplaces and local parks and green areas plus housing), but not the town's or city's major infrastructure land for vehicular traffic and railway, the town/city wide culture, administration and education facilities, parks, sports areas, and water bodies. Of the total land needed for a town/city, what is here called 'development land' amounts to only approximately 60%.

BOX 2	
Indicator group 1	Built form characteristics of sustainable urban quarters
Indicator	Size, population and dwelling densities of an urban quarter with a population of 7,500 at a town/city edge location
Comments	<p>As already indicated in Box 1, the net population and dwelling densities within an urban quarter are likely to vary depending on the location of housing closer to the urban quarter's edge or centre to generate a variety of housing types that cater for households with different socio-economic profiles and lifestyles (see Box 3a).</p> <p>Furthermore, the net population and dwelling densities of urban quarters located closer to the centre of an urban district, town or city are likely to be considerably higher than those tabled below for the town/city edge location (see Table 3.06 and Box 3b).</p> <p>The division of the urban quarter's area into housing and mixed-use land is based on case study investigations in which the division of the land was rather close to 60% for housing and 40% for mixed use.</p> <p>Target, average and threshold values are established below in response to local topographical conditions and constraints.</p>
Generally valid target, average and threshold values	<p>Target values for an optimal urban quarter at a town/city edge location:</p> <ul style="list-style-type: none"> • a radius of 530 m (max. walking distance edge to centre) • an area of 88 ha, housing land 53 ha, mixed use land 35 ha • a net population density of 140 persons per hectare (ppha) • a net dwelling density of <ul style="list-style-type: none"> ○ 67 dwellings per hectare (dpha) at 2.1 persons per household (pphh) ○ 64 dpha at 2.2 pphh ○ 61 dpha at 2.3 pphh etc. <p>These values are essential if the terrain of the urban quarter is sloping</p>
	<p>Average values for an average urban quarter if the target values cannot be achieved:</p> <ul style="list-style-type: none"> • a radius of 600 m (max. walking distance edge to centre) • an area of 113 ha, housing land 68 ha, mixed use land 45 ha • a net population density of 110 ppha • a net dwelling density of <ul style="list-style-type: none"> ○ 52 dpha at 2.1 pphh ○ 50 dpha at 2.2 pphh ○ 48 dpha at 2.3 pphh etc. <p>These values are feasible on flat terrain</p>
	<p>Threshold values for the absolute bottom line in terms of area and density of an urban quarter which should not be negotiated:</p> <ul style="list-style-type: none"> • a radius of 670 m (max. walking distance edge to centre) • an area of 140 ha, housing land 84 ha, mixed use land 56 ha • a net population density of 90 ppha • a net dwelling density of <ul style="list-style-type: none"> ○ 43 dpha at 2.1 pphh ○ 41 dpha at 2.2 pphh ○ 39 dphh at 2.3 pphh <p>These values should only be pursued in exceptional cases</p>

Location, city or region-specific values	All values for the three Scenarios are generally valid for all urban quarters in town/city edge locations with the exception of the net dwelling density. It depends on the average size of households, and these vary considerably between rural and urban regions and even between different areas of one and the same town or city. It is essential to investigate the local, city or city region household sizes when computing the net dwelling density for an urban quarter. The Glasgow average, for instance, is 2.1 pphh, but values closer to the UK and England averages are established for 2.2 and 2.3 person household sizes as well.
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3.3 Graded densities from edge to centre of the urban quarter

Graded densities in urban quarters are strongly recommended by both the Urban Task Force (1999, p.53) and Barton et al. (2003, p.201). The reasons are fairly clear: an urban quarter with a continuous density from edge to centre would tend to favour similar development forms throughout and might therefore, at least with a conventional design of urban blocks and dwelling forms, reduce the variety of dwelling types that are required to achieve a socially mixed population. The argument is that both elderly people and young professionals generally prefer more central locations in flatted accommodation with higher densities and a mixture of uses in order to be closer to services and facilities and live in a more vibrant environment. In comparison, young families with small children generally prefer edge locations with lower densities in form of family houses in a quieter and greener environment. Higher densities around the mixed-use centre of urban quarters also provide the opportunity to generate a sense of centrality and a focal point.

Although recommending graded densities of the urban quarter, the Urban Task Force does not explicitly suggest density values for edge, intermediate and central locations. For the urban quarter Barton et al. (2003, p.201) recommend graded net residential densities of 30 dwellings per hectare (dpha) at edge, 50 dpha at intermediate and 70 dpha at central locations with an average density of 50 dpha. They generate the grading of the density of an urban quarter by subdividing their neighbourhood into four sub-neighbourhoods and each of those into four equally large strips of land, one at the centre with a density of 70 dpha, one at the edge with a density of 30 dpha and two strips in between with a density of 50 dpha. If the same organisation principle were to be adopted then the density of the best, average and central urban quarter scenarios of Table 3.05 could be graded as shown in Table 3.06.

Table 3.06 Graded densities for best, average and threshold urban quarter scenarios at city edge location

Best scenario	Area / location	Size	Density	Dwellings	Population	pphh
Total land 88 ha	Core	13.25 ha	82 dpha	(1,087)	(2,283)	
Housing land 53 ha	Intermediate	26.50 ha	67 dpha	(1,775)	(3,728)	
Mixed-use land 35 ha	Edge	13.25 ha	52 dpha	(689)	(1,516)	
Average density 67 dpha,	Total/Average	53.00 ha	67 dpha	3,551	7,457	2.1

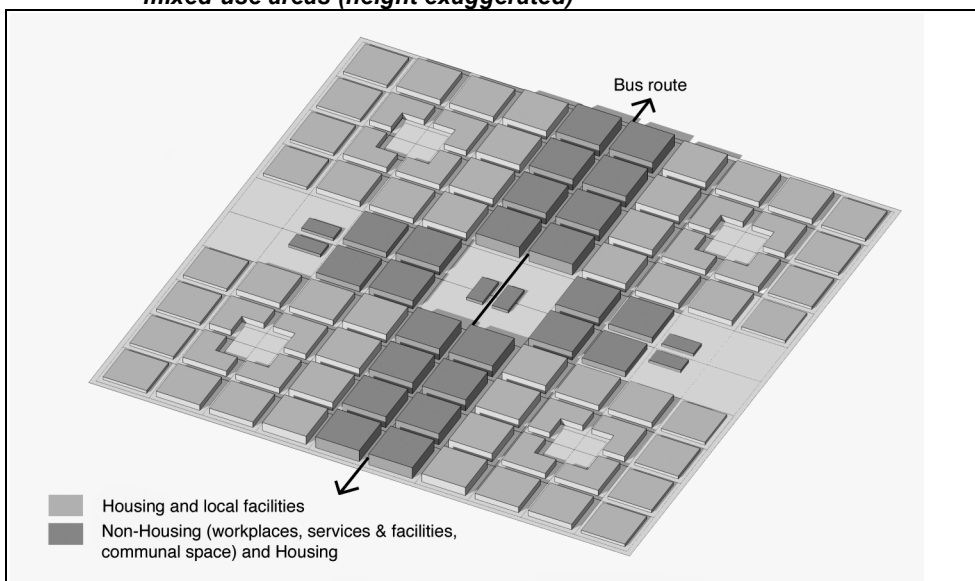
Average scenario	Area / location	Size	Density	Dwellings	Population	pphh
Total land 113 ha	Core	17.00 ha	67 dpha	(1,139)	(2,392)	
Housing land 68 ha	Intermediate	34.00 ha	52 dpha	(1,768)	(3,713)	
Mixed-use land 45 ha	Edge	17.00 ha	37 dpha	(629)	(1,447)	
Average density 52 dpha	Total/Average	68.00 ha	52 dpha	3,536	7,552	2.1

Threshold scenario	Area / location	Size	Density	Dwellings	Population	pphh
Total land 140 ha	Core	21.00 ha	58 dpha	(1,218)	(2,558)	
Housing land 84 ha	Intermediate	42.00 ha	43 dpha	(1,806)	(3,793)	
Mixed-use land 56 ha	Edge	21.00 ha	28 dpha	(588)	(1,235)	
Average density 43 dpha	Total/Average	84.00 ha	43 dpha	3,612	7,586	2.1

Scales dpha dwelling per hectare
 pphh persons per household

In the average scenario the lowest density of 37 dpha is below the recommended threshold value of (41 to) 43 dpha, but as long as the average density of 52 dpha is achieved this drop below the threshold is compensated. The same grading of the threshold scenario produces a lowest density of 28 dpha, the kind of suburban dwelling density no longer acceptable today. Although the average dwelling density equals the threshold value, this scenario should be pursued only if neither target nor average values can be achieved. This grading concept is used to generate a diagrammatic representation of the urban quarter (Figure 3.01). It shows the graded densities of the four sub-areas or local hubs adding up to the 60% housing land but also of the 40% mixed-use land, represented to its true scale. For simplicity reasons the diagram is developed for the average scenario and on a 100 by 100m grid for 1 ha large urban blocks similar to the neighbourhood diagram by Barton et al. although in practical terms these blocks need to be split for lower-density (terraced) housing.

Figure 3.01 Scaled urban quarter diagram with graded densities for the housing and mixed-use areas (height exaggerated)



Source: The Research Team

The diagram shows a subdivision of the urban quarter into four local hubs (lighter grey blocks) with housing and local facilities as listed in Table 3.01; two local hubs share a primary school located between them. The darker grey blocks accommodate non-housing and housing uses. At the core is a central community space. The mixed-use blocks are primarily located along a central boulevard that also accommodates a bus route. The division between housing and mixed-use blocks is diagrammatic and primarily for the purpose of showing how much land the non-housing uses occupy.

There is one issue that needs to be investigated further: unless carefully handled, graded densities of housing in the urban quarter might result in the zoning of different dwelling types in the urban quarter rather than a true mix of different dwelling types. To investigate whether this may indeed be a problem, the typical urban block configurations for the different densities need to be investigated and, if zoning does occur, alternative approaches need to be explored.

3.4 Graded densities of urban quarters from edge to centre of the town and city

The Urban Task Force recommends an increase of the development density of a town or city from edge to town or city centre (Urban Task Force 1999, p.61). The urban quarters forming a district have the lowest average dwelling density; the urban quarter forming a district centre has a higher average density; urban quarters surrounding the town core have a higher average density similar to that of a

district core area; the urban quarter forming the town core has an even higher average density; the urban districts surrounding the city core have average densities similar to that of a town centre area; and the urban area forming the city core has the highest average density. The resulting organisational structure of the city is hierarchical although it is somewhat doubtful whether this hierarchy can always be achieved in full.

The Urban Task Force also suggests a hierarchy of public transport systems, e.g. inside a district a bus route connecting all urban quarter cores with each other and the district core, and a faster transport system, say a tram, connecting all district cores with each other and the town core and so on. It is essential that such an integrated public transport system is developed in order to increase the degree of accessibility while at the same time reducing the need to travel by car. The Urban Task Force does not suggest actual density values; what the graded densities between city edge and city centre might be remains to be investigated. For the best scenario urban quarter that clusters to form urban districts, located close to the city edge, a target population size of 7,500 and the lowest overall target dwelling density of 67 dpha was already suggested (Figure 3.01). Considering the same increase of its dwelling density in steps of 15 dpha as used in section 3.3 allows deriving average densities for urban quarters closer to the city centre. In district, town and city centres the density is higher than that of the surrounding urban quarters and the land required to accommodate amenities is likely to be larger than the core area of a standard urban quarter at city edge location. This results in graded densities as shown in Table 3.07.

In the best scenario, the urban quarters – with 60% of the land used for housing – are all having the target area of 88ha (radius 530m) to maintain the shortest distances from edge to central facilities. The core areas of districts, towns and city are larger and the land allocation of the urban quarter has been reversed to 60% mixed-use land (non-housing and housing) and 40% housing land.

However plausible this may sound, the worries that graded densities may generate zones for different dwelling types become stronger when examining these target values. The best way to investigate this issue is to compare typical development forms of dwelling types and the densities they achieve.

Table 3.07 Graded average densities between city edge and city centre and resulting population size

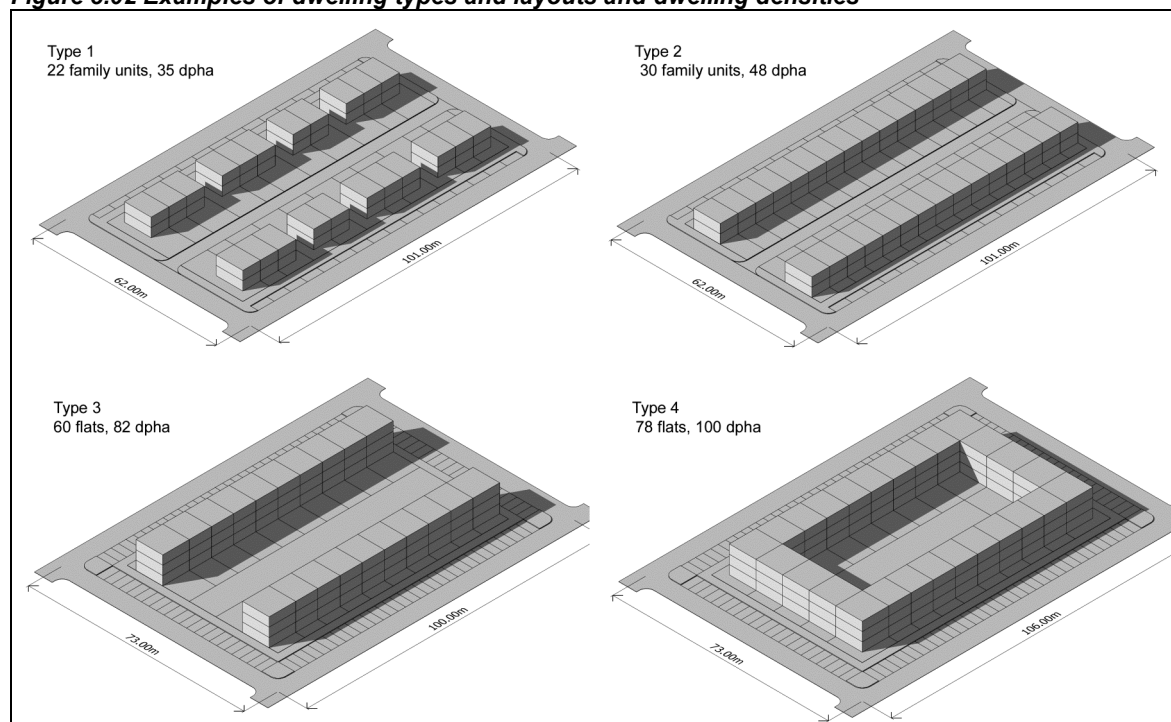
Location of urban quarters (UQs)	Average dwelling density	Number of dwellings	Number of people (at 2.1 pphh)	Target population
UQs at edge of the town/city r=530m, 88ha, 60% housing land = 53ha, 40% mixed-use land = 35ha	67 dpha	3,570	7,500	7,500
UQ as district centre r=600m, 113ha, 40% housing land = 45ha, 60% mixed-use land = 68 ha	82 dpha	3,690	7,560	7,500
UQs around town centre r=530m, 88ha, 60% housing land = 53ha, 40% mixed-use land 35ha	82 dpha	4,346	9,126	9,000
UQ as town centre r=600m, 113ha, 40% housing land = 45ha 60% mixed-use land = 68ha	97 dpha	4,365	9,166	9,000
UQs around city centre r=530, 88ha, 60% housing land = 53ha, 40% mixed-use land = 35ha	97 dpha	5,140	10,794	10,500
UQ as city centre r=600m, 113ha, 40% housing land = 45ha, 60% mixed-use land = 68 ha	112 dpha	5,040	10,584	10,500

Scale: dpha dwellings per hectare
pphh persons per household

An overall dwelling density close to the 67 dpha target has been achieved by the Homes for Change at Hulme, Manchester (69 dpha) with varied numbers of floors to achieve graded densities and a variety of dwelling types (Urban Design Compendium p.49). An overall density a little higher than 97 dpha has been achieved in the Crown Street Regeneration project in Glasgow (105 dpha). A comparison with densities proposed in the Urban Design Compendium's density matrix (p.48) shows that much higher densities are possible but not necessarily suitable in all locations except perhaps in very dense city centre core areas. Our own investigations of layout and dwelling types have resulted in examples that get rather close to some of the target values listed in Table 3.07 but it seems that there is a gap between two storey family housing densities of around 50 dpha and three floor flatted accommodation starting with densities around 80 dpha. There seems to be no smooth transition between dwelling types with private gardens and those with communal green spaces (Figure 3.02).

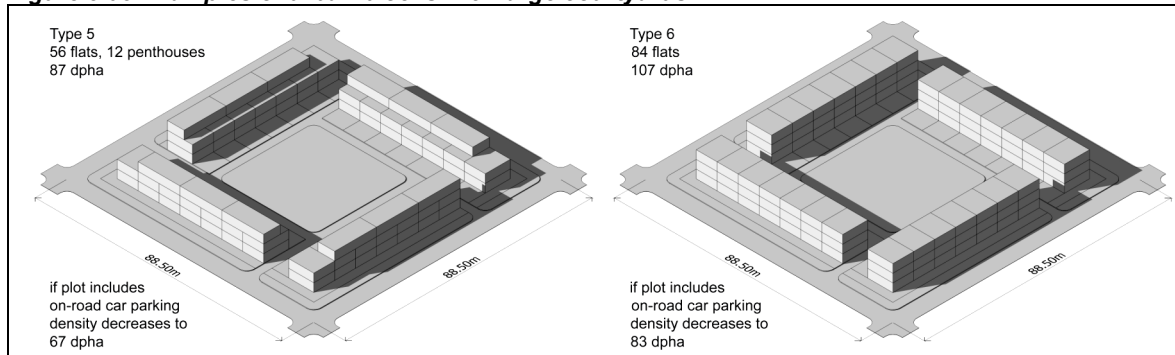
Type 1 has a typical suburban layout (semi-detached and terraced housing) and a density below the threshold value of 43 dpha. Type 2, with terraced housing and a density of 48 dpha, is a little denser than the threshold value and therefore suitable for the lowest density in the edge area of urban quarters forming districts; the problem might be that this kind of housing will be excluded in urban quarters in more central locations, located around town and city centres. Type 3 meets the target density for district core areas and of the recommended overall density of urban quarters around a town centre. Type 4, a typical Glaswegian tenement block, is suitable for the city core area but shows that there are shadow problems. Two more diagrams try to minimise the shadow problem of closed blocks and show different configurations that also meet target densities (Figure 3.02).

Figure 3.02 Examples of dwelling types and layouts and dwelling densities



Source: The Research Team

Figure 3.03 Examples of urban blocks with large courtyards



Source: The Research Team

Type 5 (Figure 3.03) achieves a density of 87 dpha provided the car parking is in the shared courtyard or underground. If car parking is along, and perpendicular to, the access roads the plot size grows to 1 ha and the density reduces to 67 dpha. Type 6 (Figure 3.03) achieves a density of 107 dpha with car parking in the courtyard or underground. If the cars are parked along, and perpendicular to, the access roads the plot size increases to 1 ha and the density decreases to 83 dpha. These two examples illustrate the potential to achieve target densities without compromising the quality of housing and environmental conditions. But the gap between conventional dwellings with private garden and conventional dwellings with communal outdoor space remains. This means potentially that the social mix in more central urban quarters will be compromised as a result of the recommended densities. There are, however, two ways to overcome this problem.

One way to solve this problem is to develop a vertical mix of dwelling types as in the Crown Street project in Glasgow (Figure 3.04). At first sight it looks rather like the traditional 4-storey tenement block development with flatted accommodation and densities well above 100 dpha. The 4 storey tenements have been modified. Ground and first floors are combined to form maisonettes with their own entrances and private gardens in the courtyard. Above the maisonettes are flats, thus achieving a mixture of flats with communal garden space and family housing with private gardens in one and the same urban block and net density of around 120 dpha with a split of half flats, half family units. That way it is possible to generate family units in areas with densities even higher than that recommended for city centre housing. The type 3 block configuration of Figure 3.02 could also have family units on ground level with own entrances as well as front and back gardens and achieve at a density of 82 dpha a mix of one third family homes, two third flats.

Figure 3.04 Vertical mixture of dwelling types - Crown Street Regeneration Project, Glasgow



Source: The Author

Another way to solve the problem is to develop a horizontal mix of dwelling types as adopted in the well-publicised urban quarter of Vauban in Freiburg im Breisgau, Germany, one of the best practice cases investigated in this project. Rather than having housing development dictated by large developers, plots of land of varied sizes were predominantly sold to individual and groups of families who developed them with their own architects according to their needs and aspirations. As a result, flatted accommodation is right next to town houses and terraces (Figure 3.05). The overall density varies from plot to plot but is overall fairly consistent; assuming an average household size of between 2.3 and 2.1 persons, the average dwelling density of the new built area is between 77 and 84 dwellings per hectare⁷.

Figure 3.05 Horizontal mixture of dwelling types – Freiburg–Vauban



Source: The author

There are accordingly approaches to the generation of mixed dwelling types that include high-quality family units as maisonettes or town houses and terraces that are achievable even in rather high town and city centre densities.

There is a difference between the vertical and horizontal mix in so far as the first needs to be pre-planned largely without influence of future inhabitants on the design, the second allows an almost random development of plots of land without any of the schemes being constrained by other schemes except for the subdivision of plots of land and the general development framework. Even more importantly, in the case of the Crown Street project individualistic designs of family units have not been achievable whereas in the case of Vauban each project of individuals or groups of people is directly planned and designed by architects for individual private developers or developer groups. If in the first case community participation was restricted to the planning phase; in Vauban future inhabitants have been and still are actively

⁷ According to information received from the Amt für Bürger Service und Informationsverarbeitung, Freiburg), in 2005 Vauban's population was 4,588 including 656 students living in converted barrack blocks (Studentenwerk) and 331 people also living in converted barrack blocks (SUSI). Accordingly it can be assumed that the number of people living in new built accommodation was 3,601. The total land size of the new built accommodation areas is 33 ha, the housing land is 61.49 % of this land area or about 20.3 ha. This means that the average population density in the new built areas is 177 persons per hectare. At an assumed household size of 2.1 persons the net dwelling density is about 84 dpha, for a household size of 2.3 persons the dwelling density drops to 77 dpha.

involved in the construction of the urban quarter. The only coordinating framework for development was set by the city council in form of a rather loose urban design framework, which regulated the location of housing rows and their minimum/maximum number of floors. There were no limitations in terms of design, choice of materials and colour, and the resulting design quality is surprising and refreshing.

BOX 3a	
Indicator group 1	Built form characteristics of sustainable urban quarters
Indicator	Graded net dwelling densities for urban quarters at town/city edge location with target, average and threshold values
Comments	<p>Graded dwelling densities from edge to centre of the urban quarter allow a variety of dwelling types to cater for different household needs and lifestyles: from family houses (detached, semi-detached, terraced) with their own gardens to apartment buildings with communal garden space.</p> <p>To establish graded densities inside the urban quarter, the housing land (100%) is divided into a core area (25%), an intermediate area (50%) and edge areas (25%) (see Table 3.06 and Figure 3.01).</p> <p>The population of urban quarters located closer to the centre of an urban district, town or city may be as large as 10,000 or more to allow for a variety of built form characteristics and their corresponding socio-economic population profiles within a town and city (see Box 3b).</p>
Generally valid target, average and threshold values	<p>Core area of the urban quarter (25% of housing land)</p> <ul style="list-style-type: none"> • target values: area 13.25 ha, net dwelling density 82 dwellings per ha (dpha) • average values: area 17 ha, net dwelling density 67 dpha • threshold values: area 21 ha, net dwelling density 58 dpha <p>Intermediate area of the urban quarter (50% of housing land)</p> <ul style="list-style-type: none"> • target values: area 26.5 ha, net dwelling density 67 dpha • average values: area 34 ha, net dwelling density 52 dpha • threshold values: area 42 ha, net dwelling density 43 dpha <p>Edge area of the urban quarter (25% of housing land)</p> <ul style="list-style-type: none"> • target values: area 13.25 ha, net dwelling density • average values: area 17 ha, net dwelling density 37 dpha • threshold values: area 21 ha, net dwelling density 28 dpha
Location, city or region-specific target values	The net dwelling densities above are calculated on the basis of an average household size of 2.1 persons. Should in urban areas the family size differ from this value, the net dwelling density should be established on the basis of the local, city or city region family size (see Box 2).

BOX 3b	
Indicator group 1	Built form characteristics of sustainable urban quarters
Indicator	Graded target densities of urban quarters at edge, intermediate and central locations of a town/city
Comments	<p>Graded net population and dwelling densities from the town/city edge to a central area, as proposed below, allow a variety of dwelling types and achieve an intensification of urban life and a sense of place in core areas.</p> <p>However, higher densities in housing areas of urban quarters closer to the town and city centre make it difficult to include traditional family housing (detached, semi-detached and terraced) due to the densities of such housing being lower than target values. The problem can to a degree be avoided by developing a vertical mix of dwelling types (as at Glasgow’s Crown Street project) with ground and first floor maisonettes and flats above, or by developing a horizontal mix of dwelling types (as at Freiburg–Vauban in Germany), with family units and flatted accommodation next to one another, or by a mixture of both (see sections 3.3 and 3.4).</p> <p>To allow for the accommodation of services and facilities with higher capacities in central areas, the size of urban quarters forming district, town and city core areas is larger than that of the urban quarters surrounding them, and their housing land is reduced to 40% of the total area.</p>
Generally valid target values	<p>Urban quarters around a district centre (town/city edge location):</p> <ul style="list-style-type: none"> • area 88 ha, average net dwelling density 67 dpha on 60% of the area, population 7,500 <p>Urban quarter as district centre:</p> <ul style="list-style-type: none"> • area 113 ha, average net dwelling density 82 dpha on 40% of the area, population 7,500 <p>Urban quarters around town centres:</p> <ul style="list-style-type: none"> • area 88 ha, average net dwelling density 82 dpha on 60% of the area, population 9,000 <p>Urban quarter as town centre:</p> <ul style="list-style-type: none"> • area 113 ha, average net dwelling density 97 dpha on 40% of the area, population 9,000 <p>Urban quarters around a city centre:</p> <ul style="list-style-type: none"> • area 88 ha, average net dwelling density 87 dpha on 60% of the area, population 10,500 <p>Urban quarter as city centre:</p> <ul style="list-style-type: none"> • area 113 ha, average net dwelling density 112 dpha on 40% of the area, population 10,500
Location, city or region-specific target values	The net dwelling densities above are calculated on the basis of an average household size of 2.1 persons. If locally the average family size differs from this value, the net dwelling density should be established on the basis of the local, city or city region average family size (see Box 2).

3.5 Household density and total number of dwellings

The last investigation within the section on built form is the influence of shrinking household sizes on the number of dwellings required. The average size of households in Glasgow is 2.1 persons per household (pphh) (GRO (Scotland), Census 2001), which is adopted for the calculation of the number of dwellings of urban quarters in Glasgow. Barton et al. (2003, p.201) suggest a household density in England of 2.3 pphh; the Urban Task Force (1999, p.61) uses a household density of 2.2 pphh. To achieve reasonably accurate figures for the number of required dwellings, it is recommended to adjust the household size to the local average. Based on a household size of 2.1 ppha and a total

population of an urban quarter of 7,500, the total number of dwellings is 3,570. With growing household density the number of dwellings is shrinking: for a population of 7,500 and 2.2 pphh the number of dwellings is 3,409 and for 2.3 pphh 3,260. The effect of different average household sizes on the required number of dwellings for recommended target population sizes is illustrated in table 3.08.

Table 3.08 The impact of household sizes on dwelling numbers

Population size	Average 2.3 pphh ¹	Average 2.2 pphh ²	Average 2.1 pphh ³
7,500	3,261 dwellings	3,409 dwellings	3,571 dwellings
9,000	3,913 dwellings	4,091 dwellings	4,286 dwellings
10,500	4,565 dwellings	4,773 dwellings	5,000 dwellings

Sources 1) Barton et al. 2003

2) Urban Task Force 1999

3) GRO (Scotland) 2001 Census: Glasgow average

Scale pphh persons per household

Over and above the difference of household densities, there are strong differences of household sizes in some ethnic and religious groups, which have to be responded to in order to provide the dwelling sizes required by the population of urban quarters.

BOX 4	
Indicator group 2	Social characteristics of sustainable urban quarters
Indicator	The average household size
Comments	As already indicated in Boxes 2, 3a and 3b, the number of dwellings required in urban quarters depends not only on the total population but also on the average household size to be accommodated. The household size differs considerably in diverse towns and cities of the country, and also in urban areas of one and the same town or city. Therefore no generally valid value can be established, as varied local conditions need to be reflected.
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>The value for an average household size needs to be established on the basis of local conditions. For example: the Glasgow average household size is 2.1 persons; this value is used to establish the number of dwellings in Glasgow's urban quarters. The local conditions of urban quarters in the Glasgow-Govan area are investigated and appropriate target values are established and documented in the Urbanising Suburbia Summary Report.</p> <p>To reflect local conditions, it is important to investigate the composition of local social, ethnic and religious groups and their housing needs.</p> <p>The number of people working from home is growing and this too has implications for the variety and sizes of dwellings in an urban quarter. As conditions change, housing should become more adaptable to changing spatial demands. In the core areas of urban quarters, districts, towns and the city adaptability is especially important to allow a change of use from housing to studios, shops, small offices, specifically on the ground floor of buildings.</p> <p>There has also been a steady reduction of household sizes in the UK between 1961 and 2001 and this tendency is continuing. This generates pressure, not only to build more housing, but also necessitates the available housing stock to be much more adaptable to changing spatial needs.</p>

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Chapter 4

Socio-economic characteristics of sustainable urban quarters and corresponding physical and economic characteristics of their built form

The indicators and values regarding overall population size, dwelling density, types of local services and facilities, and availability of public transport are important for the strategic planning and conception stage of urban regeneration and development are not the only characteristics of a sustainable urban quarter. Much of the built form of an urban quarter or city is directly or indirectly the result of social and economic needs and aspirations of the inhabitants, and the political, cultural and socio-economic systems of which they are a part. What is generally seen to be of key importance regarding socio-economic sustainability is that an urban quarter's population should be 'socially inclusive' and 'economically balanced'. The characteristics upon which inclusiveness and balance are said to depend are the focus of this section.

Social inclusiveness of an urban quarter expresses itself in a combination of specific characteristics (see section 4.1):

- *a balanced population age profile*: it influences population renewal and the steady need for, and support of, services and facilities;
- *a balanced mix of household types and sizes*: it prompts the type and size of the accommodation required by households;
- *a balanced profile of educational achievements of people of working age*: it affects employment and income levels, a balance of economically active and inactive people, and the steady use of a wide range of services and facilities.

The population's general health and levels of deprivation are additional indicators.

Economic sustainability of the urban quarter's population expresses itself clearly in one key characteristic (see section 4.2):

- *a balanced profile of economically active and inactive people of working age*: this profile is the result of social characteristics of households (population age profile and educational achievements).

These social and economic characteristics and profiles are partially dependent on, and partially responsible for, three **built form characteristics** of the urban quarter (see section 4.3):

- a balanced mix of dwelling types;
- a balanced mix of tenure types; and
- a balanced range of land and property prices and rent levels.

Environmental / ecological sustainability of the urban quarter expresses itself in a number of ecological concepts:

- energy use and conservation;
- sewer, waste water and rainwater reuse;
- landscaping.

This section investigates the target values and value profiles of the socio-economic characteristics of sustainable urban quarters and their influence on the urban quarter's built form in dependence on current conditions.

4.1 The factors responsible for social exclusion in residential areas and the scale at which spatial segregation becomes a problem

The call for socially inclusive urban residential areas is supported by virtually all political institutions – from the United Nations to the European Council and Executive and the UK governments – but seems to be one of the values of sustainability most difficult to define let alone achieve. The research team’s study of areas in Glasgow and elsewhere has clearly shown that residential land-use shows strong patterns of social as well as spatial segregation. Two main factors are responsible for the difficulty to overcome such segregation.

The first factor is that households with similar socio-economic profiles make similar choices in the selection of the place in the city they want to live in. Accordingly, similar households tend to cluster in particular locations. The choice of location is a function of a household’s age profile, type and size, educational achievement and income level, health, and ethnicity, but also of the quality, price and rent levels of dwellings on offer, the quality of local facilities and the quality of the surrounding built and natural areas (compare Herbert and Thomas ([1990] 1991, pp.207-253).

The second factor is that both the private and public housing agencies tend to provide dwelling types as uniform clusters, for example: suburban detached units for young families with children; high-density flatted ‘executive’ units in and close to the CBD and other prestigious locations in the city; ‘affordable’ family units in less prestigious locations; ‘private-rented’ units in areas around the city centre for migrating people; ‘old people’s homes’ in the surrounding countryside; ‘social-rented’ units in peripheral estates. Accordingly, not only dwelling types with their different price and rent levels are spatially segregated, but also the dwellers and their households are socially and spatially segregated according to ethnicity, age, educational achievements, employment and income. A particular problem causes the clustering of social-rented accommodation, often in the environmentally poorest areas of the city. In the UK, national governments have made local authorities responsible for those with the lowest incomes, who tend to be heavily dependent on housing benefit. This necessitates the provision of social housing in response to housing needs. The Urban Task Force (1999, pp.296-7) states: ‘The statutory homeless obligation on local authorities for rehousing vulnerable families and individuals combines with the 100% housing benefit system to create ever greater pressures towards polarisation and poverty within social housing’. The main problem is not the provision of social housing but that it is concentrated in social housing estates rather than integrated into mixed tenure areas.

To achieve a socially inclusive city generally requires the transformation of its residential areas, specifically social housing estates, into mixed tenure areas. In the report *Towards a Strong Urban Renaissance* published by the Urban Task Force in 2005 it recommends that a target should be set ‘to transform all social housing estates into mixed tenure communities by 2012’ to ensure mixed tenure, income and ethnicity communities (Urban Task Force, 2005, p.11). To achieve this would necessitate at least in Scotland, if not generally in the UK, the review of current responsibilities of Housing Associations and Cooperatives for the improvement of most of the social housing estates. As long as they have little other remit than improving the existing social housing stock in their areas it is virtually impossible to transform social housing estates into mixed tenure areas. A viable, balanced and well functioning community is only achievable if, in addition to housing provision and quality, all other human needs and aspirations – access to workplaces, education and training, local shops and community services, schools, open spaces, recreation facilities, and access to public transport – are considered and responded to. Housing Associations and Cooperatives would have to be transformed into something like ‘community councils’, fully supported by the Local Authorities and with a full remit of responsibilities and the required public and private funding to achieve not only social inclusion, but all other values of sustainable urban areas discussed in the *Handbook*. Achieving social

inclusion in urban quarters necessitates the availability of a mixture of dwelling types at different price and rent levels to cater for all income groups. The research team has investigated both the changes to residential areas and to the socio-economic profiles of their inhabitants that would reduce social exclusion of the poorest households. In view of the scale of social estates the task of such transformation would be formidable. Theoretically these changes can be implemented, but in view of the first factor discussed above, the issue of the preference of households with similar socio-economic profiles to cluster, the question remains whether the resulting social mix would be accepted.

What then has to be considered is the lack of discussion, and therefore the uncertainty, about which scale social and spatial inclusion or segregation is accepted, or the scale at which it becomes unacceptable. The highest level of social and spatial segregation is when households of specific socio-economic levels, e.g. low-income groups dependent on housing benefit, become separated in different areas of the city, specifically if these areas are located at the city periphery. Inhabitants of such peripheral estates in Glasgow have (in public discussions) shown considerable discontent about having been virtually cut off from more central areas in Glasgow because of long bus journeys and the travel expenses. Clearly, at this scale of spatial segregation social exclusion is unacceptable, but it remains unclear at what smaller scale of spatial segregation – urban quarter by urban quarter, sub-area by sub-area of urban quarters, urban block by urban block, street by street, or dwelling by dwelling inside residential buildings – social inclusion is achievable and accepted. However, if a sustainable urban quarter is a model of a sustainable city, then it should have a mix of household types and socio-economic levels similar to that of the city at large.

To summarise, the key characteristics of a socially inclusive urban quarter are a balanced population age profile, a balanced mix of household types and sizes, and a balanced mixture of tenure types (see Box 5). The spatial arrangement and grouping of tenure types, however, is likely to involve some smaller-scale spatial segregation within the urban quarter. What such balanced profiles might be is investigated below.

BOX 5	
Indicator group 2	Social characteristics of sustainable urban quarters
Indicator	Socially inclusive urban quarters
Comments	Social inclusion in urban quarters depends on a balanced mix of social and socio-economic characteristics of the population as will be established in the following sections. To achieve socially inclusive urban quarters requires that they provide accommodation and facilities for all social and income levels. In practical terms, to achieve a mix of dwelling and tenure types requires the physical and social transformation of residential areas, specifically of social housing estates, into mixed-tenure urban areas. How a socially inclusive urban quarter might be achieved is discussed in the following sections.
Generally valid targets	The transformation of urban areas into sustainable and socially inclusive urban quarters requires the full collaboration of all inhabitants and stakeholders. This necessitates the forming of ‘community councils’ with a full remit, not only to improve and expand the existing housing stock and infrastructure, but also to deal with all other needs and aspirations of members of the community: access to work and building up local businesses and workplaces; a decent education, training and income; access to local services and facilities and public transport; income support and housing benefit for marginalised groups; and so on. What this means is the introduction of local government at the micro level of the urban quarter that represents the interests of all inhabitants and stakeholders and deals with the same issues town or city councils have to deal with on a higher level.

	<p>Community councils have to have the full support of local authorities and access to public and private funding to transform, in collaboration with public and private stakeholders, their urban areas into sustainable urban quarters with a socially and economically balanced population.</p> <p>A good example of this model of local government on an urban quarter level is the then Forum and today's Community Council of the urban quarter Freiburg–Vauban, discussed in chapter 5 of the Urbanising Suburbia Summary Report.</p>
Location, city or region-specific target values	Not applicable

A balanced population age profile

A balanced age profile is one that allows ‘a steady progress of population renewal’ and an even demand for local facilities such as schools, whereas an unbalanced age profile generates peaks and troughs of demand (Barton et al. 2003, pp.83-4). The importance of a balanced age structure becomes clear in the research team’s investigation of car suburbs in Glasgow – built in the 1980s and 1990s on greenfield sites at the edge of the city to retain population and attract people to return to the city. These suburbs were built for simoilar kinds of people and households. The investigation showed that most of those suburbs for which data were gathered had a fairly young population of middle to higher income, single persons and a high percentage of young couples with children; but there are no local services and facilities, no play areas and schools and no public transport. High as the housing and environmental quality in such suburbs may be, the population was generally far too small to support local facilities, and depended on services, amenities and schools, outside its own area and on the car to get there; such suburbs are in the long term not sustainable.

To achieve a balanced age profile in existing urban areas requires the careful study of their current age profile and then the promotion of new development that attracts those people into the area that would balance the age profile. Of course this goes also for other population characteristics such as education, employment and income levels. But rather than undertaking the impossible task of fishing for people with specific socio-economic characteristics, the location preferences of those groups – quality of housing and the environment, dwelling and tenure type, property prices and rent levels – would need to be responded to.

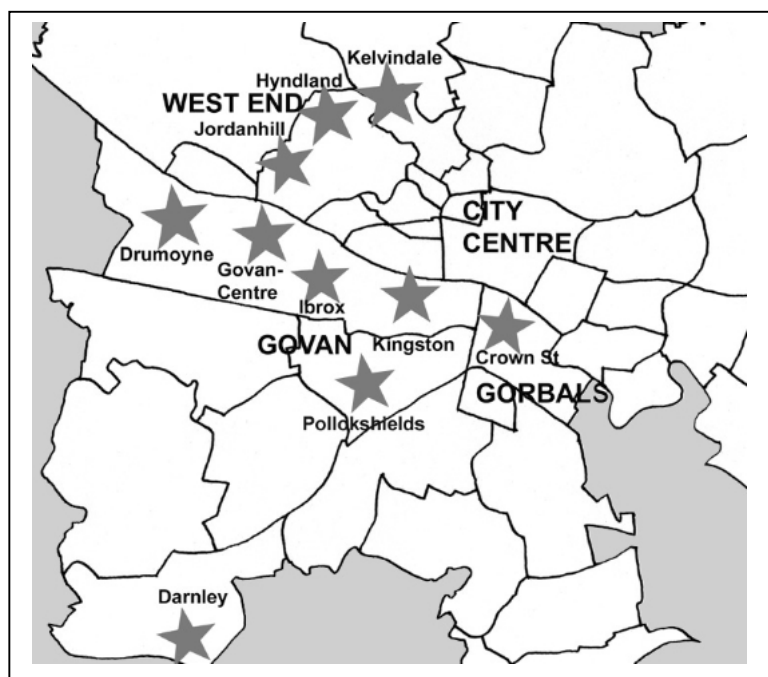
When searching for data on balanced age profiles, the study of governmental guidelines and research papers was disappointing because no recommendations were found as to what a balanced age profile of an urban community actually is. An investigation of the age profiles of a number of urban quarters in Glasgow was therefore undertaken that showed considerable differences and also gave an insight into the dependence of age on specific built form characteristics of the investigated urban areas. The choice included three areas in Glasgow’s prosperous West End and the four areas investigated in Govan (Table 4.01). For the four residential areas in Govan the average values are documented, as their detailed investigation is included in the *Summary Report*.

Table 4.01 Age profiles of urban quarters in Glasgow and of Glasgow as a whole, 2001

Age groups	Jordanhill %		Kelvindale %		Hyndland %		Govan (all 4 areas) %		Glasgow %	
0-4	7.4		4.0		3.9				5.2	
5-15	13.3	20.7	10.0	14.0	6.2	10.1		18.0	12.5	17.7
16-29	14.1		23.6		27.5				22.1	
30-44	21.9		22.6		30.7				24.2	
45-59/64	22.8	58.8	22.4	68.6	18.4	76.6		65.6	18.6	64.9
60-65+		20.6		17.3		13.3		16.4		17.4

Source: GRO (Scotland) Census 2001

Figure 4.01 Glasgow City, showing location of study areas



Of all areas Jordanhill shows the highest percentage of children of school age and pensioners, and the lowest percentage of people of working age. This is most likely the result of the area's medium to low development density and the rather limited range of dwelling and tenure types in this area, predominantly rather expensive owner-occupied villas and terraced family homes with large gardens and only some flatted accommodation. The area is generally calm and therefore good for bringing up children, has good schools but few other services and facilities. Hyndland, by contrast, has of all areas the lowest percentages of school age children and of pensioners and the highest percentage of people of working age. This is undoubtedly the result of the rather high development density and poor mix of dwelling and tenure types, predominantly four storey tenement blocks with large and expensive owner-occupied flats, very good local services and facilities and schools and good access to public transport; but environmentally the area is not very suitable for bringing up children. The area has therefore become popular for economically active people with medium to high income that like the vibrant mixed-use environment. The percentage of people in the pension age group is accordingly rather low. It is interesting to compare Jordanhill with Kelvindale, the latter a residential area predominantly with family housing, but the houses are semi-detached and terraced, built in the interwar period and considerably smaller and also more affordable. There are more families with children than in Hyndland but almost 4% less than the city average. The area has become popular for young professionals, and many of the 2 and 3-bedroom houses are inhabited by only one or two-person households (Figure 4.02).

Govan is a much more mixed area in terms of tenure and house types with a range of dwelling types from semi-detached to terraced, four-in-a-block, traditional tenements and high-rise flats. With the exception of new residential units at the riverfront, property prices and rent levels are substantially lower than the Glasgow average. Three of the four urban quarters have some of the city's highest levels of deprivation. Although the individual areas have somewhat different age profiles, the average is rather close to the values of Glasgow overall (Figure 4.03).

Figure 4.02 Glasgow West End areas



Source: The author

Figure 4.03 Glasgow Govan areas



Source: The author

The investigation of these seven residential areas shows clearly that the built form, density, variety of dwelling and tenure types, the quality and variety of local amenities and public transport and the affordability of dwellings of an urban quarter have a rather distinct impact on the socio-economic profiles of its inhabitants and suggests that social inclusion heavily depends on a mix of dwelling and tenure types, amenities as well as price and rent levels. It again becomes clear that socio-economic target profiles are very difficult to formulate and justify without reference to existing conditions. This suggests that average local values are more appropriate as general guidelines for age profiles. With almost 70% of all dwellings being tenements, Glasgow is a typical Scottish city rather different from cities in England, as Table 4.02 shows.

Table 4.02 Age profiles of the regions and countries of the UK, 2003, percentages

	Age 0-15	Age 16-64	Age 65 +
North East	19.1	64.1	16.8
North West	20.0	63.9	16.1
Yorkshire & the Humber	19.9	63.9	16.2
East Midlands	19.6	64.2	16.2
West Midlands	20.3	63.6	16.1
East	19.8	63.6	16.7
London	19.6	68.4	12.1
South East	19.6	63.9	16.5
South West	18.7	62.6	18.8
England	19.7	64.4	15.9
Wales	19.7	62.9	17.5
Scotland	18.7	65.2	16.2
Northern Ireland	22.8	63.7	13.5
United Kingdom	19.7	64.4	16.0

Source: Office for National Statistics 2005

Of the Government Office Regions of England in 2003, for the age group 65 and over the South West had the highest percentage (18.8%) and London had the lowest percentage (12.1%) and also the highest percentage in the working age group (68.4%). Of the UK's constituent countries in 2003, Northern Ireland had the youngest age profile (22.8% aged under 16, and only 13.5% aged 65 and over). Scotland had the lowest percentage of the under 16-age group. London's extreme values show that it is a rather special and therefore an atypical city. The average values of England and the UK are identical, also rather close to those of Scotland and therefore a useful guide for the age profile of urban quarters. The recommended target age profile values are therefore 18.5% for the under 16-age group, 65% for the 16-64 age group, and 16.5% for the 65+ group. Modifications of and subdivisions within the three age groups have to be based on local conditions and the specific characteristics of urban areas under investigation. There is, however, one phenomenon that needs to be kept in sight when deciding on age profiles of urban areas in years to come: the UK population has become older in the last three decades and is predicted to get still older in the next three decades (Table 4.03).

Table 4.03 The changing age structure of the UK population, percentages and years

Year	0-15	16-64	65 +	Median age
1971	25%	62%	13%	34.1 years
2003	20%	64%	16%	38.4 years
2031	17%	60%	23%	43.3 years

Source: Office for National Statistics 2003

These changes of the age profile are caused by declining birth and mortality rates. It seems that, with a shrinking number of under 16 year olds and a growing number of the 65+ group, the working age population will be falling as Table 4.03 suggests but will have to support a growing number of pensioners. The question that remains so far unanswered is at what point of this development the age structure is likely to become critical.

One way of balancing the age profile is by 'importing' skilled and educated people in working age from other countries, and there are already for a decade or two clear tendencies to do so if currently only to overcome the growing shortage of skilled labour and professionals in specific disciplines. Leaving aside this larger perspective of changing age profiles and a shrinking working age population, there is again the question whether specific built form characteristics relate to specific population age profiles.

To investigate this, it is useful to return to the study of urban areas in Glasgow, which has shown that there are variations of built form characteristics (specifically development density and predominant dwelling type) that favour specific population age profiles. The Glasgow case studies seem to suggest that graded densities encourage different age profiles in different parts of the urban quarter and this is documented in Table 4.04.

Table 4.04 *The suitability of graded density areas for population age groups* (for the average urban quarter scenario)

Area	Area characteristics	Suitability for school age group	Suitability for working age group	Suitability for pension age group
Core area (excl. the 45 ha communal space and non-housing uses)	17 ha @ 67 dpha = 1,139 dwellings for 3, 2 & 1 pph 140 ppha Predominantly flats, 3 storeys, with some town houses	Density and predominant accommodation type do not favour couples with young children	Very good access to central services and facilities and a public transport stop favours individuals and couples of working age	Short distances to central services and facilities and public transport makes this area a good place for the 65+ age group
Intermediate area	34 ha @ 52 dpha = 1,768 dwellings for 4, 3 & 2 pph 110 ppha Predominantly terraced, 2-3 storeys	Lower density and still good access to services and facilities makes this area a good place for school age, working age and pension age groups		
Edge area	17 ha @ 43 dpha = 714 dwellings for 5 & 4 pph 90 ppha Predominantly a mixture of detached, semi-detached and terraced, 2 storeys	Lowest density and predominant dwelling type makes this the most suitable area for bringing up children	The longer distances to central amenities and public transport are generally no problem for this age group	The longer distances to central services and facilities and public transport make this area less suited for pensioners
All areas	3,621 dwellings			
Scale	dpha ppha phh	dwellings per hectare (net density) persons per hectare (net density) persons per household		

BOX 6	
Indicator group 2	Social characteristics of sustainable urban quarters
Indicator	A balanced population age profile
Comments	<p>A balanced age profile influences population renewal and the steady need for, and support of, services and facilities. If, for instance, the under-16 age group is significantly smaller than the target value, the demand for school places will be smaller and school places will be underused or may have to be closed; if it is significantly larger, the current provision of school places will be overused and additional school places may have to be provided. If, for instance, the 16-64 age group is significantly smaller than the target value, the number of those economically active might be too small to support local services and facilities. If, for instance, the 65+ age group is significantly smaller than the target value, the demand for places in old people's homes will be small and such facilities may have to close; if it is significantly larger, the number of places in some facilities will be insufficient.</p> <p>A specific problem with the age group profile is that new-built low-density suburban areas tend to attract a rather young population that is too small to support local services and facilities, specifically schools and public transport. This shows that urban areas with a homogeneous built form are likely to have skewed population profiles and problems with the continued support of local amenities.</p>
Generally valid target values	<p>The suggested target age group profile of an urban quarter is close to the average age profile of England, Scotland and the UK as a whole.</p> <ul style="list-style-type: none"> • 18.5% of the under-16 age group • 65.0% of the 16-64 age group, and • 16.5% of the 65+ age group

<p>Location, city or region-specific target values</p>	<p>Although the proposed age group profile suits average Scottish, English and UK conditions, there are considerable deviations from this average profile in specific urban quarters, towns and cities. Investigations of 2001 age profiles have come up with a profile in Glasgow–Kelvindale with 10.1% of the 0-15 age group, 76.6% of the 16-64 age group and 12.1% of the 65+ age group (Table 4.01); the 2001 average of London’s age profile is 19.6% of the 0-15 age group, 68.4% of the 16-64 age group and 12.1% of the 65+ age group (see Table 4.02).</p> <p>It is therefore imperative that the local, city or regional profiles are studied to develop a population profile that corrects place-specific values imbalances. It is furthermore important to monitor the tendency of the percentage of the under-16 age group to become significantly smaller and that of the 65+ age group to become significantly larger.</p> <p>In addition, in terms of people’s perception of the location of an urban quarter and graded densities, there is a potential problem. Families with children tend to prefer the outer areas of the town and city, while more centrally located urban quarters are perceived as less suitable for them but more suitable for people in the working and pension age groups, reducing the chance of achieving a similar average age group profile in all town and city areas and influencing the demand for local amenities, especially schools. This problem can to a degree be avoided by generating a vertical mix of dwelling types as in the Glasgow Crown Street project or a horizontal mix of dwelling types as at Freiburg–Vauban in Germany or a mixture of both (see sections 3.3 and 3.4). Both examples, as many others, show that it is possible to develop high quality family housing in dense urban areas.</p>
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A balanced mix of household types and sizes

It has already been highlighted earlier that different residential areas may favour different age profiles. The same can be expected regarding household types. It is, however, important that local authorities develop policies for the balancing of the dwelling sizes to achieve a match between household types and housing stock. Overall in the UK the percentage of people in the 65+ age group is growing (see table 4.3) and this has a considerable impact on the demand for dwellings suitable for 1 and 2 person households (Table 4.05).

Table 4.05 Percentage changes in UK household sizes between 1991 and Spring 2001

Household (HH) size	1961	1971	1981	1991	2001
One person	14	18	22	27	29
Two people	30	32	32	34	35
Three people	23	19	17	16	16
Four people	18	17	18	16	14
Five people	9	8	7	5	5
Six or more people	7	6	4	2	2
Av. number of pers./ HH	3.1	2.9	2.7	2.5	2.4

Source: Office for National Statistics: Labour Force Survey Household Datasets

Between 1961 and 2001 the one and two person households have steadily grown, whereas the percentage of larger households has been shrinking. This has resulted in the shrinking of the average household size in the same period from 3.1 to 2.4 persons as well as in the growth of personal space per person, and this has fuelled the demand for more dwellings. It should not, however, be forgotten that the number of people working from home has increased as well and with it the demand for work space in people’s homes. It is therefore essential to consider a degree of adaptability of space specifically in the denser core area of the urban quarter and specifically on street level to allow changes of space use from housing to workshops, shops, studios and the like. The percentages of household sizes as shown above are average values for the UK; it can be expected that, similar to the

differences in age profiles, there are also differences in the profile of household types in the different countries of the UK and indeed in different cities (Table 4.06).

Table 4.06 The percentage of household types in the UK (Spring 2002¹) and Glasgow (2003²)

	One person households	Married couples with children	Married couples without child.	Lone parent households	Other households
UK	29.1	29.0	28.4	9.5	4.0
England	28.8	29.1	28.8	9.3	4.1
Wales	28.8	29.8	27.6	9.9	3.8
Scotland	32.8	26.8	26.9	9.7	3.8
Northern Ireland	29.6	35.8	22.6	10.9	---
Glasgow	43.2	24.3	23.9	8.6	---

Sources 1) Office for National Statistics, Labour Force Survey Household Datasets; Department of Economic Development, Northern Ireland

2) Glasgow City Council Estimates 2003

The percentages for household types in the UK, England and Wales are rather similar and a recommendation to adopt these values as targets would be understandable. It seems however, that there are cultural differences in Scotland and Northern Ireland in particular. Scotland has a higher percentage of one-person households and smaller percentages of married couples with and without children, whereas Northern Ireland has the highest percentage of married couples with children and lone parent households and the lowest percentage of married couples without children. Glasgow's figures are, however, considerably different: the city has a very much higher percentage of one person households and also considerably lower percentages for married couples with and without children. Without going into any more details it is clear that setting a generally valid average set of household type values would be unreasonable. The recommendation is to study local and regional values and respond to them. There is furthermore the argument that in terms of the provision of housing with the appropriate number of spaces, the number of persons per household is more important than the social composition of these households. This becomes clear when returning to the urban quarters in Glasgow's Greater Govan area and comparing household sizes with the Glasgow and Scotland averages (Table 4.07).

The values show that in Govan there is a high concentration of small households; more than 75% of them accommodate 1 and 2 persons whereas 3 to 6-person households (phh) are less than 25%. The Glasgow average values are less extreme but still show that more than 70% of all households have 1 or 2 persons. In contrast, the Scottish average shows a much lower percentage of 1-person households but a higher percentage of 2 to 5-person households.

Table 4.07 The percentage of household sizes in Greater Govan, Glasgow and Scotland, 2001

	1 person household	2 person household	3 person household	4 person household	5 person household	6+ person household
Drumoyne	44.6	29.0	13.9	8.2	3.2	1.1
Govan Centre	54.0	26.7	9.6	5.5	3.1	1.1
Ibrox	48.3	28.5	11.8	6.5	3.4	1.4
Kingston	45.1	30.8	11.2	6.9	3.6	2.4
Govan Average	48.0	28.8	11.6	6.8	3.3	1.5
Glasgow	41.9	29.5	14.2	9.3	3.6	1.5
Scotland	32.8	33.1	15.6	12.9	4.3	1.3

Source: GRO (Scotland) 2001 Census

What has been recognised repeatedly is that local conditions have to be taken into account. A reasonable response to the question what dwelling types should be considered for new build housing in the Govan area may be that there is a lack of larger families with children and that an attempt should be made to attract families to the urban quarters if only to secure the viability of local schools. A suitable target household size profile would be the Glasgow average. This in turn would require that family dwelling types ought to be built in Greater Govan that allows bringing up children. However, what Govan also needs is a stronger urban form in the centre of the urban quarters – where some of the developable land is located – that actually allows intensification in response to the scale of new development along the banks of the River Clyde.

Such an attempt was made in the Crown Street Regeneration Project, and its way to achieve both family housing and urbanity was to return to the 4-storey tenement but to transform the ground and first floor flats into maisonettes with their own private entrances and garden spaces. It is somewhat doubtful whether this type of housing succeeded in attracting families to the project but this may have to do with its proximity to the city centre that attracted a high percentage of younger business people to locate in Hutchesontown. Here is a design challenge to be taken up in Govan, which unfortunately cannot be responded to in this research project due to time and resource limitations; but the two examples of the Crown Street Regeneration Project with a vertical mix of dwelling types and a horizontal mix as generated in the urban quarter Freiburg-Vauban (compare Box 3) show viable design approaches.

It is this kind of argument and investigation that has to take place when dealing with actual urban quarters rather than an abstract framework for regeneration. The argument also shows that there might be conflicting demands regarding urbanity and family housing that require the prioritisation of sustainability characteristics. It is also necessary to investigate the environmental qualities of potential areas of regeneration before making a priority decision. Returning to Glasgow's Govan area and its household characteristics: it would be beneficial if at least the Glasgow average could be achieved (see Box 7).

BOX 7	
Indicator group 2	Social characteristics of sustainable urban quarters
Indicator	An average household size target profile for urban quarters
Comments	The investigation of average household sizes in the UK as a whole and in different regions and cities of the UK has shown a vast divergence of values that does not allow a generally valid profile to be adopted. The only trend that all UK areas and cities share is a general decrease of the size of households – from 3.1 persons per household in 1961 to 2.4 persons per household in 2001 – and the general increase of the percentage of one and two person households – from 44% 1 and 2 person households in 1961 to 64% in 2001 (see Table 4.05).
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>The average profiles of 1 to 5+ person households in towns, cities and regions of the UK differ to such a degree that only location-specific profiles can be suggested with any degree of certainty.</p> <p>An investigation of Glasgow and specifically the Glasgow–Govan areas illustrates the process of establishing a reasonable profile that reflects local conditions and corrects imbalances. The 2001 share of 1 and 2 person households of the Govan area as a whole is 76.8% compared with 71.4% of Glasgow, 65.9% of Scotland and 64% of the UK. The recommendation is therefore that the Govan areas should have the distribution of the Glasgow average with the following values:</p> <ul style="list-style-type: none"> • 42.0% 1-person households • 29.5% 2-person households • 14.5% 3-person households • 9.5% 4-person households • 4.5% 5+person households <p>This profile could be achieved with new executive type housing in central and riverfront locations that would attract larger families with children into the area, not least to boost the demand for local schools.</p>

A balanced profile of educational achievements of people in working age

In urban areas high levels of deprivation coincide all too frequently with low levels of educational achievement and high levels of relative poverty. An educational profile will tell us about the concentration of people with high or low levels of qualification in an urban quarter, a town or city or it will indicate that there is a balance of groups with different educational achievement. The best way to achieve a balance is to offer those with low or no qualifications education and training to achieve higher qualifications and gain access to workplaces that offer a higher income. This was the policy for many decades, but unfortunately very little has been achieved as a result of ‘... the ever greater pressures towards polarisation and poverty within social housing’ pointed at by the Urban Task Force (1999, pp.296-7). This was mentioned earlier at the beginning of this section on social values. Whether or not the statutory homeless obligation on local authorities and the 100% housing benefit system will be reviewed, as long as social housing estates with high levels of deprivation are not transformed into a better mix of qualifications, income and tenure, the polarisation and poverty within social housing will continue and get worse. What could be done to reduce, if not overcome, the spatial segregation of low-income households in disadvantaged areas is to equitably distribute them throughout the town or city’s urban areas. It can be expected that such a policy would be resented especially in residential areas with high socio-economic profiles. Therefore measures to

improve the profile will have to be established on a place-by-place basis. Glasgow and Scotland overall will stand again as examples (Table 4.08).

Table 4.08 Qualifications of people in Glasgow and Scotland aged 16-74, percentages

All people of aged 16-74	No qualifications	Highest qualification obtained: level 1	Highest qualification obtained: level 2	Highest qualification obtained: level 3	Highest qualification obtained: level 4
Govan-Drumoyne	50.0	24.7	10.7	1.0	13.6
Govan Centre	52.2	23.4	10.2	0.3	17.8
Govan-Ibrox	48.1	21.9	11.8	6.3	11.9
Govan-Kingston	31.5	19.6	16.6	9.0	23.3
Glasgow City (threshold)	42.5	21.0	13.5	6.0	17.0
Scotland adjusted (target)	34.5	25.0	15.0	6.5	19.0

Source: GRO (Scotland) Census 2001

Table 4.08 show that Glasgow has a rather high percentage of over 42% of the population aged 16 to 74 with no qualifications. This indicates the problems of the collapse of traditional industries in Glasgow and its development into a post-industrial city already referred to. Three of the four urban areas of the Govan district of Glasgow show the percentage of those with no qualification to be as high as 48 to 50%, indicative for the high levels of underachievement of these areas. In comparison, Scotland overall has a more balanced qualification profile with over 10% fewer people with no qualifications and all other levels of qualification having higher percentages. It would be good for the city to achieve at least the Scotland average levels of qualification. It should be thoroughly investigated how people with no qualification at all can be successfully brought back into education and training to achieve at least level 1 or 2 qualification. Further attempts should be made to increase the number of workplaces that require traditional skills to give those with such skills the chance to return to economic activity. But until these objectives have been achieved, the key recommendation remains to attempt a more equitable distribution of low-income households in all districts of the city.

BOX 8	
Indicator group 2	Social characteristics of sustainable urban quarters
Indicator	A balanced qualification profile for urban quarters
Comments	The investigation of educational achievements and qualification profiles of people in urban quarters of towns and cities, and also in different regions of the UK, has shown a vast divergence of values that does not allow a generally valid profile to be adopted. The particular problem is that low-income groups with poor educational achievements are not only socially but also spatially excluded, and tend to cluster in the least advantaged areas of a city. The task is therefore to achieve a similar balance of educational achievements in all urban quarters that reflects local conditions and helps amend imbalances.
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>An attempt to increase the qualification profiles can only be made on a local basis. This can again be illustrated with an example from Glasgow. The average qualification profiles of areas in Glasgow–Govan are again used to illustrate the process of developing targets and threshold values. The 2001 share of people in 3 of the 4 Govan areas (excluding Kingston) without any qualification is 50.1% compared with 43.5% of Glasgow and 34.5% of Scotland. Consequently there are high levels of unemployment and deprivation in the areas. The recommendation is therefore that the Govan areas should have the distribution of the Glasgow average as threshold profile and that of Scotland as target profile.</p> <p>The threshold profile for the Glasgow–Govan areas: the Glasgow average</p> <ul style="list-style-type: none"> • 42.2% no qualification • 21.0% level 1 qualification • 13.5% level 2 qualification • 6.0% level 3 qualification • 17.0% level 4 qualification <p>The target profile for the Glasgow–Govan areas: the Scottish average</p> <ul style="list-style-type: none"> • 34.5% no qualification • 25.0% level 1 qualification • 15.0% level 2 qualification • 6.3% level 3 qualification • 19.0% level 4 qualification <p>To achieve such improvements, attempts have to be made to bring people without qualification back into education and training. Attempts should also be made to increase the number of workplaces that require traditional skills to help unemployed people with such skills to return to economic activity. Attempts should also be made to achieve, throughout the city, a more equitable distribution of the number of people without qualification and therefore likely to be unemployed or carrying out low-paid jobs. In parallel, attempts should be made to attract people with higher educational achievements into deprived areas to balance the local qualification profile.</p>

Health conditions of people

The percentages of people with and without limiting long-term illness (LLTI) is a further indicator whether in residential areas of a city there are concentrations of ill-health as a result of low income and/or poor living conditions. Table 4.09 below shows that the highest percentages of ill health can be found in three of Govan’s urban quarters with some of the highest percentages of single person households (Table 4.06), of social rented accommodation (Table 4.07), and of a high levels of poor or no educational achievements (Table 4.08).

Table 4.09 Percentage of people with and without limiting long-term illness (LLTI)

Place	Total population	% of populat. with LLTI	% of populat. without LLTI
Govan - Drumoyne	8,240 = 100%	31.7	68.3
Govan Centre	3,935 = 100%	32.2	67.8
Govan - Ibrox	7,139 = 100%	30.2	69.8
Govan - Kingston	4,436 = 100%	21.8	78.2
Glasgow	577K = 100%	26.2	73.8
Scotland	5,062K = 100%	20.3	79.7

Source: GRO (Scotland) Census 2001

Deprivation indicators

Table 4.10 shows again that the same three of the four urban areas in the Govan district of Glasgow have some of the highest deprivation levels of the city and Scotland and this corroborates the data of Tables 4.07 - 4.09. It would be an achievement for these areas to have at least the average level of Glasgow (although that is not so good either). It can be concluded that a high percentage of single person households, limiting long-term ill health, people in working age without any qualifications, and of low Scottish Index of Multiple Deprivation (SIMD) rankings are indicators of people trapped in social-rented housing areas. Until improvement of these values is achieved – through concerted actions to get people back to education and training and consequently to employment and a decent income – their spatial separation should be overcome by a more even distribution in all urban areas of the city.

Table 4.10 The multiple deprivation ranking of Govan areas, Glasgow and Scotland

Place	SIMD ¹ Ranking of 6,505 output areas (0 – 6,505 (worst to best)		% of total pop. income deprived ²	% of persons of working age claiming benefits ¹	SIMD ¹ of 1,222 wards (used in area investigation; 0 – 1,200 worst to best)	
Govan - Drumoyne	634	9.8%	38.8	42.0	68	5.6%
Govan Centre	153	2.4%	45.2	38.9	24	2.0%
Govan - Ibrox	266	4.1%	42.2	36.5	13	1.1%
Govan – Kingston	1470	22.6%	24.4	18.0	158	12.9%
Glasgow City	1613	24.8%	---	---	306	25.0%
Scotland	3253	50.0%	---	---	611	50.0%

Source: 1) Scottish Index of Multiple Deprivation, Scottish Executive 2004
2) GRO (Scotland) Census 2001

BOX 9	
Indicator group 2	Social characteristics of sustainable urban quarters
Indicator	Dealing with the concentration of deprived people in specific urban areas
Comments	<p>The lack of qualifications, extent of long-term illness and high levels of deprivation are all indicators of marginalised people who have become trapped in social housing estates; they are not only socially but also spatially segregated. It is vital to increase, through massive educational and training programmes, their qualifications to at least level 1 or 2 and increase knowledge and skills for them to become economically active again. The causes of ill health need to be investigated and dealt with; poor housing conditions may play a significant role and re-housing in good quality housing is vital. Such efforts should also achieve a more even distribution of the deprived in the city to overcome their spatial segregation by becoming part of socially mixed communities.</p> <p>Such efforts need to involve deprived people and the community at large, and the model for this already proposed in Box 5 is to form community councils that include representatives of all socio-economic groups, including the currently marginalised, and have a full remit of planning and decision making in collaboration with local authorities and all other stakeholders. Deprived people can best be helped by making them part of a socially inclusive community, because they will have a chance to help themselves with the help of the community. The already quoted example of such an approach is the then Forum and today's Community Council at the new urban quarter Vauban at Freiburg im Breisgau, Germany.</p>
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>To summarise, in order to achieve social inclusion of the marginalised, attempts have to be made</p> <ul style="list-style-type: none"> • to bring people without qualification back into education and training, • to increase the number of workplaces that require traditional skills to help unemployed people with such skills to return to economic activity, • to achieve throughout the city a more equitable distribution of the number of people without qualification and therefore likely to be unemployed or carrying out low-paid jobs, • to attract people with higher educational achievements into deprived areas to balance the local qualification profile. <p>All these attempts should be planned and monitored by community councils that represent and respond to the needs of the community and specifically of those currently deprived.</p> <p>As an example of threshold and target values, for the Govan area in Glasgow the threshold SIMD (Scottish Index of Multiple Deprivation) rank has been suggested to be the Glasgow average (1613 of 6505), the target has been set to be the Scottish average (3253 of 6505).</p>

4.2 Socio-economic characteristics of urban quarters

The economic performance of an urban quarter's population depends on the social characteristics of people and households already investigated. Therefore the study of income levels would only confirm what the investigation of qualifications of people of working age, long-term ill health and deprivation levels have revealed.

Car ownership is often used to point at the disposable income of people. For a sustainable urban quarter a high percentage of car ownership is not desirable, especially when used in the urban

quarter, town and city. In any case, not owning a car does not always mean having a low income. Car ownership in the West End of Glasgow, for instance, is relatively low, but people living in this part of the city are generally well off as they can afford some of the highest property prices in the city. With good local services and facilities and with good public transport (railway, underground and bus) a car is not really needed. In addition, parking the car in Glasgow's West End is a problem as the result of the rather high overall development density and the predominance of on-street car parking. As a result, a high percentage of non car owning people rely on walking within the urban quarter and on public transport in the city and beyond.

Only two economic indicators are important at the strategic planning and conception stages and need therefore to be investigated because they reveal potential, or existing, problems as a result of skewed profiles: the balance between economically active and inactive people on the one hand, and the range of property prices and rent levels on the other.

A balanced profile of economically active and inactive persons

It is obvious that the tax and pension fund payments of the economically active support those who are economically inactive, the largest percentage of whom are retired people. It is equally obvious that the proportion of the economically active should far higher than that of the economically inactive in order to keep tax and pension contributions at a reasonable level. There is, however, the fact that the age structure of the population in the UK, as in other developed countries, is changing: the percentage of people aged 65 and over is projected to increase to 23% by 2031 as the median age is projected to rise to 43.3 years the same year; this trend has been studied already earlier (Table 4.03). At the same time the percentage of those aged 16 to 64 is expected to decrease to 60% by 2031. The number of economically active people of working age that supports a growing number of pensioners is shrinking. The percentage split of the economically active and inactive is therefore of considerable importance (Table 4.11). The Scottish average can be considered as being a well-balanced profile with 65% economically active and 35% economically inactive people aged 16-74. Aberdeen has an even better profile, and so has Edinburgh. Dundee and Glasgow have much higher percentages of economically inactive people and therefore an unbalanced profile. Three of the four Govan areas show percentages of economically inactive people close to or considerably above the Glasgow average, and this confirms the previously noted poor performance of these urban areas in terms of qualifications, limited long-term illness and deprivation levels. Only Kingston has a balanced profile close to the Scotland average, which is taken as target profile.

Table 4.11 The percentage of economically active and inactive people aged 16-74 in Scottish cities and the Govan areas of Glasgow

		Scot land	Aber deen	Dundee	Edin burgh	Glas gow	Dru moyne	Goven Centre	Ibrox	King ston
Economically active	p/t employed	11.1	11.1	10.3	10.1	8.4	9.9	7.5	7.0	5.6
	f/t employed	40.3	44.3	35.5	43.0	34.5	31.5	28.7	28.6	45.0
	Self-employed	6.6	5.3	4.1	6.7	4.1	2.5	2.0	1.9	5.6
	Unemployed	4.0	2.7	5.4	2.9	5.5	5.9	9.6	8.4	4.8
	f/t student	3.0	5.0	4.8	4.8	3.5	2.3	2.0	2.8	4.2
	Total econ. active	65.0	68.5	60.1	67.5	56.0	52.1	49.8	48.7	65.2
Economically inactive	Retired	13.9	12.0	14.8	12.4	12.4	14.0	11.6	9.5	8.4
	Students	4.3	6.6	8.1	7.4	6.2	3.0	3.6	4.6	5.9
	Looking after family/home	5.5	4.6	4.6	4.4	6.6	7.2	7.8	8.9	5.8
	Perm. sick/disabled	7.4	5.1	8.3	5.0	12.3	15.9	18.8	18.0	8.8
	Other	3.9	3.2	4.1	3.3	6.5	7.8	9.4	10.3	5.9
		Total econ. inactive	35.0	31.5	39.9	32.5	44.0	47.9	51.2	51.3

Source: GRO (Scotland) Census 2001

BOX 10	
Indicator group 3	Socio-economic characteristics of sustainable urban quarters
Indicator	A balanced profile of economically active and inactive people aged 16-74
Comments	A good balance of economically active and inactive people is one that has a substantially higher percentage of economically active than economically inactive people. A concentration of people with low educational achievements, ill health and high deprivation levels can be expected to have also a high percentage of economically inactive people. Every effort should be made to bring economically inactive people other than pensioners back to economic activity through training and education programmes.
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>Generally valid targets cannot be established, as all efforts need to reflect the specific local conditions in urban areas, towns, cities and urban regions. Therefore an example illustrates how threshold and target values are formulated for Glasgow. Of all Scottish cities, Glasgow has the lowest percentage of economically active people aged 16-74 (56%) but three of the four Govan areas (excluding Kingston) have even lower values (average 50.2%). Therefore a threshold value has been set for the Govan areas to achieve at least the Glasgow, at best the Scottish average:</p> <ul style="list-style-type: none"> • threshold values: 56% economically active and 44% economically inactive people aged 16-74 (Glasgow average); • target values: 65% economically active and 35% economically inactive people aged 16-74 (Scottish average). <p>The social and spatial exclusion of low income people from the more prosperous areas of the city should be overcome by a more equitable distribution throughout the city as well as a balanced mix of dwelling types (see Box 11), a balanced mix of tenure types (see Box 12) and a balanced range of property prices and rent levels (see Box 13).</p>

4.3 The built form characteristics of an urban quarter prompted by its socio-economic characteristics

Balanced socio-economic profiles, as discussed in section 4.2, prompt an appropriate response by the built form of urban areas, specifically an appropriate mix of dwelling types, tenure types as well as property prices and rent levels: these are discussed in what follows.

A balanced mix of dwelling types

The mix of different types of dwellings in an urban quarter influences decisively its level of social inclusion and its population age profile as shown in section 4.1. A considerable difference of the mix of dwelling types can be expected in smaller towns in comparison to big cities and specifically their central areas. A comparison of the dwelling type profiles of Glasgow, London, Scotland and England shows a considerable deviation of values (Table 4.12).

Table 4.12 Percentage of dwelling types: Glasgow 2001¹, Scotland 2001¹, London 2001/2², and England 2001/2³

House type	Glasgow		Scotland		London		England	
Detached	3.5		20.4		4.0		21.0	
Semi-detached	13.3		23.5		19.0		32.0	
Terrace houses	13.6	30.4	20.3	64.2	28.0	51.0	28.0	81.0
Flats and other	30.4	69.6	35.8	35.8	48.0	48.0	18.0	18.0

Source 1) GRO (Scotland) 2001 Census
2) Office for National Statistics, General Household Survey 2001-02
3) ODPM, English Housing Survey 2001-02

Glasgow's predominant dwelling type is the tenement although only the historical distinction of 'working class' and 'upper class' tenements allows linking the tenement with specific income groups. In comparison with Scotland overall, Glasgow's values are almost reversed. London has an almost even split of family housing and flats but is not a typical city, and dwelling types in England are overwhelmingly family homes. This comparison does not, however, lead to any conclusions as to what constitutes a sustainable mix of dwelling types. A more reasonable way of finding such a mix is to investigate the consequences of graded densities in urban quarters and to translate development densities into dwelling type categories (Table 4.13).

Overall the split of 56% flats and 44% family houses in the best scenario may be unsuitable for urban quarters at the edge of a town or city but it is suitable for urban quarters in intermediate location where densities are higher. In the average scenario with an overall density of 52 dpha the core area of the urban quarter is best suited for flatted accommodation of 3 to 4 storeys. The intermediate area with a dwelling density of 52 dpha is suitable predominantly for terraces and some semi-detached houses of 2 to 3 storeys height. The edge area with a density of 37 dpha is best suited for predominantly semi-detached and terraced houses with some detached houses. The resulting split between flatted and family accommodation is 32% flats and 68% family houses.

Table 4.13 Establishing the mix of dwelling types corresponding with graded densities of best and average scenario urban quarters (to include below threshold, average and target dwelling densities)

Area	Size	Dwellings per ha	Dwelling types	Dwelling numbers	Percentages	
Best scenario						
Core area (excl. 35 ha comm. space)	13.25 ha	82 dpha	Flats, 3-4 floors with enclosed block	1,087	30.6%	55.6% flats
Intermediate area	13.25 ha	67 dpha	Flats, 3-4 floors, open-ended block	888	25.0%	
	13.25 ha	67 dpha	Terraced houses, 3 floors	888	25.0%	44.4% family houses
Edge area	13.25 ha	52 dpha	Semi-detached + terraced, 2-3 floors	689	19.4%	
Total	53.00 ha	67 dpha		3,552		100.0%
Average scenario						
Core area (excl. 35 ha comm. space)	17.0 ha	67 dpha	Flats, 3-4 floor with open-ended block	1,139	32.2%	32.2% flats
Intermediate area	34.0 ha	52 dpha	Semi-detached + terraced, 2-3 floors	1,768	50.0%	67.8% family houses
Edge area	17.0 ha	37 dpha	Detached and semi-detached + terraced, 2 floors	629	17.8%	
Total area	68.0 ha	52 dpha		3,536	100%	100%

Scale dpha dwellings per hectare

BOX 11	
Indicator group 4	Built form characteristics of a sustainable urban quarter prompted by its socio-economic characteristics
Indicator	A balanced range of dwelling types (categories)
Comments	The crucial difference regarding dwelling types is that between family homes with private gardens (detached, semi-detached and terraced) and flatted accommodation with shared garden space. The study of dwelling type profiles in the UK has revealed considerable differences (Table 4.12) that do not allow a generally valid value profile to be set.
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>Generally valid targets cannot be established; therefore all efforts need to reflect the specific local conditions in urban areas, towns, cities and urban regions. An example illustrates how threshold and target values are formulated for Glasgow. Glasgow is renowned as a city of tenements, and the 2001 percentage of flatted accommodation, including 'working class' and 'upper class' tenements, is indeed 69.6%, that of family homes is only 30.4%. The 2001 Scotland average is only 35.8% flats, 64.2% family homes (compare this with the England average of 18% flats and 81% family homes).</p> <p>For Glasgow and Scotland the target split between flats and family homes, dependent on their location in the urban quarter, has been set to be:</p> <ul style="list-style-type: none"> • 34% flats, 66% family houses at edge location • 44% flats, 56% family houses at intermediate location • 54% flats, 46% family houses at centre location <p>For other towns, cities and city regions in the UK location-specific target profiles need to be established.</p>

A balanced mix of tenure types

The mix of tenure types is of considerable importance for achieving the inclusion of all social and income groups. The problem with the concentration of social rented accommodation in estates was already mentioned. In the last decade or so, many housing associations in Scotland have invited private developers into their areas to achieve some social mix, but the question of what constitutes a balanced mixture of tenures types remains to be answered.

The common distinction of tenure types is that of social-rented and shared ownership accommodation (usually a small percentage of social rented dwellings), private-rented accommodation, and owner-occupied accommodation. The latter group can be divided into affordable flats and houses with lower prices, more expensive flats and houses and even more expensive detached houses with large gardens, but at least in the UK the split between social rented and other tenure types is decisive. The UK government suggests in Planning Policy Guidance Note 3 on housing that up to 30% of new build housing should be affordable (DETR 2000). In addition, special needs housing for infirm elderly people ought to be considered as well. But as in previous sections it is difficult to find any recommendations as to what the actual mix ought to be. When studying data it becomes clear that there are considerable differences of values between continental Europe and the UK, within the UK between North (Scotland) and South (England), and between London and Glasgow (Table 4.14).

Table 4.14 Comparison of the distribution of households across tenures: Germany, UK, England, Scotland, London, Glasgow and Greater Govan in Glasgow
(percentages rounded up)

Country/City	Owner-occupied	Social-rented	Private-rented	Other
Germany 2002 ¹	43.0	8.0	49.0	---
UK 2000/01 ²	70.0	21.0	9.0	---
England 1999/00 ³	69.0	15.0	10.0	6.0
Scotland 2001 ⁴	62.0	27.0	6.0	5.0
London 2001/2 ⁵	58.0	26.0	16.0	---
Glasgow 2001 ⁴	49.0	39.0	7.0	5.0
Glasgow Govan ⁴	40.0	46.0	14.0	---

Sources: 1) Statistisches Bundesamt Deutschland

2) Office for National Statistics

3) DTLR

4) GRO (Scotland) Census 2001

5) ODPM, English Housing Survey

In April 2002, 57.4% of households in Germany lived in private- and social-rented accommodation and 42.6% in owner-occupied accommodation. The percentage of social-rented households was 8.7% in 2003 and 9.0% in 2004. With regard to social-rented households, there were considerable differences between the Former Bundesländer (8.3%) and the New Länder (without Berlin 12.6%) and between wealthier Länder like Bayern (5.4%) or Baden-Württemberg (5.6%) and less wealthy Länder and cities like Mecklenburg-Vorpommern (17.1%), Berlin (14.6%) and the Hansastadt Bremen (14.5%) (Statistisches Bundesamt 2006). What is specifically striking for us in the UK is the comparatively high percentage of 49% of all households in private-rented accommodation; building for rent seems the normal way in Germany to supply affordable housing and thus reduce the percentage of households in social-rented accommodation rather effectively, something more difficult to achieve with a high percentage of owner-occupied housing.

In comparison, in 2000-01, the UK's percentage of households living in owner-occupied accommodation (owned outright or with a mortgage) was 70%, while 21% of households were living in social-rented accommodation and 9% in private-rented accommodation (Office for National Statistics). In 2001, the Scottish percentage of households in owner-occupied accommodation (owned outright or with a mortgage) was 62%, while 27% were living in social-rented accommodation and 5.6% of households in private-rented accommodation (2001 Census). Glasgow shows the highest percentage of households living in social-rented accommodation but it shows, what was already hinted at, the high concentration of low income households in social housing areas like those in the Govan area.

There is, however, another lesson to be learned when comparing Scottish values: Glasgow's high percentage of social-rented households is the result of the collapse of traditional industry, leaving high levels of unemployment and many people with 'old skills' unable to find work in the new service industries due to a lack of the appropriate education and training. It is clear that the distribution of the existing tenure types is a function of political and socio-economic conditions that were generated in the mid to late 19th century. The key condition is that if there are so many households depending on social housing and benefit, then the required number of social-rented accommodation needs to be provided in a city overall. It is essential, however, to establish a city average tenure profile and apply it as well as possible to all of the city's urban quarters and districts.

It is now necessary to investigate recommendations for specific urban quarters as to what the split between social-rented and owner-occupied housing ought to be. In its Grand Canal Dock Planning Scheme, the Dublin Dockland Development Authority (DDDA) went for a split of 20% social housing and 80% private housing (DDDA, 2000, p.4) but it is questionable whether this equates to the city average. The split is also 20% social and 80% private housing of all new build housing at the

Greenwich Millennium Village, London (English Partnerships), but again this is not the city average and would not help solve the much higher concentration of social housing in Inner London East (44%).

When planning for the new urban quarter Rieselfeld in Freiburg im Breisgau, Germany, the City of Freiburg decided a split of 50% subsidised social (rented) and 50% private (owner-occupied and private rented) housing (Amt für Bürger Service und Informationsverarbeitung, Freiburg im Breisgau) whereas the new urban quarter Vauban in Freiburg has an estimated percentage of less than 10% social-rented dwelling units. In view of the rather small percentage of social-rented accommodation in Baden Württemberg of 5.6%, the decision on a 50/50 split in Rieselfeld related to a specific shortfall of social housing in the City of Freiburg. The decision may also have been influenced by the fact that in Vauban the percentage of social housing is small as the city had to acquire the land and had to sell to recuperate the costs and finance the new public transport infrastructure of the urban quarter. Rieselfeld might have been used to compensate and balance the books for the city overall because the city owned that land, and public transport infrastructure was in the vicinity and had only to be extended; the city could therefore sell plots to developer groups for owner-occupied and social-rented housing.

The Freiburg examples indicate that an even distribution of tenure types might not always be economically viable. It is also possible that there may be resistance by the local population to changes in tenure profiles in areas with a high-quality built and/or natural environment. These are additional reasons why for each urban quarter priorities have to be set by communities, local authorities and other stakeholders in close collaboration with local residents to achieve a balanced and agreed 'compromise' programme for urban regeneration.

BOX 12	
Indicator group 4	Built form characteristics of an urban quarter prompted by its socio-economic characteristics
Indicator	A balanced mix of tenure types
Comments	<p>The key objective for setting a target tenure profile for urban quarters is to promote social inclusion, specifically the integration of households depending on social housing provision rather than concentrating social-rented accommodation in housing estates, as was the case in the 1950s and 1960s.</p> <p>Ideally all urban quarters of a town or city ought to have the same or a similar percentage of social-rented dwellings to achieve an equitable distribution of low-income households.</p> <p>When studying data it becomes clear that there are considerable differences of values between continental Europe and the UK, within the UK between North (Scotland) and South (England), and between London and Glasgow (see Table 4.14). A generally valid target is therefore not viable.</p>
Generally valid target values	Not applicable

Location, city or region-specific target values	<p>As a result of the differences, a location-specific target is required and it is arrived at by establishing the overall percentage of households in a specific town or city in need of social housing provision. Again Glasgow stands as an example. Its average is considered to be a balanced mixture of tenure types for urban quarters in that city:</p> <ul style="list-style-type: none"> • 49% owner-occupied, of which <ul style="list-style-type: none"> ○ 29% upper-market owner-occupied, ○ 20% affordable owner-occupied • 39% social-rented • 7% private-rented • 5% other <p>As in Glasgow 39% of households require social-rented dwellings, this percentage ought to exist in any Glaswegian urban quarter to achieve an equitable distribution of low-income families. In practical terms, it might not be possible to achieve an equal distribution, for instance as a result of land and property values, and targets may vary from place to place as long they have been negotiated with and agreed upon by the communities and stakeholders.</p>
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A balanced range of property prices and rent levels

Urban quarters with either consistently high or consistently low property prices and rent levels are clearly socially exclusive either because the lower income groups will not be able to locate in areas with high property prices and rent levels, or the higher income groups will not want to locate in such areas. To restructure old, and avoid new spatially segregated urban quarters and areas for the advantaged and the disadvantaged requires a balanced mix of property price and rent levels.

The search for a suitable target profile, and for a balanced range of property prices and rent levels in the Glasgow-Govan area, included a survey of property prices and rent levels in the Govan area. The survey concluded that there is a good mix of tenure and dwelling types as well as a good mix of old and new residential accommodation. According to the Register of Sasine for sale in 2006 and the Glasgow City Council 2006 Land Audit, property prices ranged from an amazingly low £3,615 for a second hand first floor flat in an early 20th century tenement block to £309,995 for a new six floor executive type property at the Garden Festival Park development. The most expensive property outside the Garden Festival Park development was a second hand non-flatted property that sold for £200,000. Less than a decade earlier such high prices would have been unthinkable in Govan. It seems that new development at northern riverfront locations seems to have whetted the appetite of developers to push south across the river and into the Govan area. The very recent financial crises may have dampened that appetite, but the range of property prices is suitable for achieving a degree of social inclusion.

A further investigation focused on the equivalent profiles of tenure types that coincide with categories of property prices and rent levels. The investigation of tenure types, already presented in section 4.3, was equally influenced by the range of property prices and rent levels in the Govan area of Glasgow. An overlap of both sets of data led to the recommendation of categories of tenure types as established in Table 4.14 and Box 9 (target for a mix of tenure types), but with an introduction of different sub-categories of owner-occupied housing into ‘upper-market’ and ‘affordable’ owner-occupied housing. The adopted target tenure profile for Glasgow and the Govan area is equivalent to the Glasgow average as shown in Box 13.

BOX 13	
Indicator group 4	Built form characteristics of an urban quarter prompted by its socio-economic characteristics
Indicator	A balanced range of property prices and rent levels as expressed by a balanced mix of tenure types
Comments	Rather than establishing price and rent categories that fluctuate over time, the recommended mixture of property prices is expressed through the equivalent mixture of tenure types. Due to the considerable differences in the UK already commented upon in Box 12, no generally valid target value profile can be established.
Generally valid target values	Not applicable
Location, city or region-specific target values	<p>As a result of the differences, a location-specific target is required and it is arrived at by establishing the overall percentage of households in a specific town or city in need of social housing provision. Again Glasgow stands as an example. Its average is considered to be a balanced mixture of tenure types for urban quarters in that city:</p> <ul style="list-style-type: none"> • 49% owner-occupied, of which <ul style="list-style-type: none"> ○ 29% upper-market owner-occupied, ○ 20% affordable owner-occupied • 39% social-rented • 7% private-rented • 5% other <p>For other towns and cities in and outside Scotland the profile needs to be adapted to local conditions and the appropriate mix of tenure types and the local range of property prices and rent levels.</p>

4.4 Summary

The search for social and socio-economic target and threshold values of a sustainable urban quarter has been marked by the complete lack of proposals of appropriate population profiles that would achieve social and economic balance. The relevant publications and research papers studied by the research team investigate primarily existing conditions of social exclusion and spatial segregation of groups of people with similar socio-economic profiles and how these conditions emerged. How social exclusion and segregation could be reduced, if not overcome, is generally not debated. This gives the strong impression that there is a widespread belief that exclusivity and segregation is the inevitable outcome of the different socio-economic profiles of people and their wish to live in urban areas that accommodate others of similar standing.

History tells, that early cities were generally socio-economically stratified, and so was the pre-industrial city. It is, however, often forgotten that – with notable exceptions like, for instance, Nebuchadnezzar’s Babylon or even more so Imperial Rome – the scale of these cities was rather small, often with walking distance from edge to core area, frequently only as large as the urban quarter discussed in this *Handbook*; accordingly the scale of spatial segregation of different socio-economic groups was also relatively small. Today’s city is huge in comparison, and so is the potential scale of the spatial segregation of groups of people of different status unless that city is a construct of urban quarters. Accordingly, a modular structure of the city based on urban quarters potentially reduces the scale of spatial segregation from up to 10, 20 or more kilometres (the diameter of the city) to about 600 metres (the diameter of the urban quarter) provided each of the urban quarters

has a profile of socio-economic groups similar to that of the city at large. The research team suggests, therefore, that the city as a construct of urban quarters increases not only pedestrian access to local services and facilities and public transport nodes but potentially increases the degree of social inclusion, and for this reason the team also suggests that urban quarters should have a socio-economic profile similar to that of the city or city district they are part of.

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Chapter 5 Conclusions

The purpose of *Urbanising Suburbia—The Handbook* was to explain the basis of the arguments that established the target and threshold values – key elements of the *Tool* for the measurement of the levels of sustainability of urban areas.

Although there is a lot of discussion on sustainable urban development, the *Handbook* demonstrates that disappointingly few research projects, publications and recommendations by the UK governments and the European Commission have actually produced target or threshold values for sustainable urban form and development. The few values that were recommended focus exclusively on built form characteristics, specifically the size and population of urban quarters as well as the gross and net population and dwelling densities required to support local services and facilities. Yet even the few recommended target and threshold values for built form characteristics are not supported by strong empirical evidence.

When it comes to socio-economic characteristics and target values as part of sustainable urban areas, towns and cities, there is an astonishing silence in the ranks of relevant professionals, academics, the UK government or EC departments. If one considers that companies producing products for general use by the public cannot afford working without goals and values – a car manufacturer considering, for instance, target consumption and threshold emission levels, speed and safety characteristics – why is it that the production of the most important of all ‘products’, the city in which the vast majority of us lives and works, draws so little attention?

There is one answer to that question that is frequently put forward. The physical reality of the city – its buildings, open spaces, and its service, transport and communication infrastructure is planned, constructed, changed and expanded in a continuous process, the outcomes of which are predictable not as a whole, but in the production of individual components. The socio-economic reality of the city is either unplanned, or cannot be planned; it emerges, changes and expands spontaneously and, it seems, randomly in a process the outcomes of which are unpredictable. Yet, there is a clear interaction between, and interdependence of, the physical and the socio-economic reality of the city. From the analysis of urban areas the research team of this project has concluded that specific types of built form attract or repel groups of people with specific socio-economic profiles. This in turn means that specific groups of people influence, if not prompt, the development of specific types of built form to which they are attracted, which they need in order to conduct their businesses, bring up their families, offer their services to other groups of people, all in accordance with their socio-economic status and corresponding living standard.

If one accepts these two statements that are supported by empirical evidence, then one understands why settlement schemes and residential areas produced on the basis of mere speculation of planners, architects and developers as to what people want – for instance during the 1950s and 1960s – were after a short time rejected and many of them had in the end to be taken down: they failed to respond to the needs and aspirations of virtually all groups of society regardless of their different socio-economic profiles. This experience prompted two responses: a) the attempt of the public housing agencies, in collaboration with housing associations and cooperatives, to sort out the problems in social housing estates and involve communities of these estates in that process; b) the efforts of the private housing agencies to respond the needs and aspirations of groups of people with different socio-economic profiles and develop a range of appropriate dwelling types. Unfortunately,

peripheral and other social housing estates were not, or not yet effectively enough, transformed into mixed tenure areas and remain spatially segregated from more prosperous residential areas. Unfortunately also, the private housing agencies provided different dwelling types in uniform clusters rather than generating residential areas with a mix of dwelling types. That way the problems with social exclusion and spatial segregation are not efficiently enough dealt with.

It is interesting that in the UK the approach of involving people in the process of urban regeneration and development was adopted in the repair of social housing estates and not in the development of private housing schemes. It is also interesting that the development of new private residential areas continues to follow the old patterns of assuming what people want, building it and then waiting for customers. The direct involvement of individual and groups of households and their architects as private developers in the design and construction of an urban quarter, Freiburg's approach to the development of Vauban and Rieselfeld, is still almost unthinkable in the UK, although according to information received by the Project Group Vauban, this approach has proved to be faster and less expensive than schemes of large developer companies; it furthermore avoids the tiresome repetitiveness of conventional schemes. If one returns to the argument that individuals and groups of people have no difficulty in defining what their needs are and what kind of residence and immediate surrounding they would like to have, then the direct involvement of people generates residential areas that are tailor-made for their inhabitants. This approach also produces residential areas with a mix of dwelling and tenure types and broader social inclusion as long as it involves households with different socio-economic backgrounds and smaller social housing agencies, as was particularly the case in Freiburg-Rieselfeld.

It has been stated at the beginning of the *Handbook* that the planning and construction or regeneration of an urban quarter is best based on common goals that should be achieved, i.e. on target and threshold values that promote sustainability. This approach becomes essential when the planning or regeneration of an urban quarter involves a multiplicity of small private developer groups as well as public housing agencies because the different individual projects need to be coordinated to make sure that they together produce a well-functioning, enjoyable and sustainable urban quarter. This is what the City of Freiburg did when planning the urban quarters Vauban and Rieselfeld, and it involved those people in the process of formulating threshold and target values that would later form the communities of these new urban quarters.

Some critics may say that an approach to urban development or regeneration based on threshold and target values is restrictive in the sense that it prevents innovative solutions and promotes repetitive forms of residential areas. The author would like to suggest to these critics either to visit Vauban in Freiburg or read *Urbanising Suburbia – Final Report*, specifically chapter 5, a well-illustrated investigation of Freiburg's urban quarter Vauban. The quality and visual variety of the built form and the quality of landscaping is outstanding and rather refreshing compared with the tiresome repetitiveness of the same façades, material and colours of conventional projects involving large private developers. Approaches to achieve a mix of dwelling types in high-density schemes in the Crown Street Regeneration Project at Glasgow (with vertical mix of dwelling types) and at Freiburg-Vauban (with horizontal mix of dwelling types) have been compared in chapter 3. This comparison provides further evidence of the disadvantages of large-scale housing schemes: they are designed without feedback from future inhabitants and therefore disallow the personalisation of individual housing units. Vauban makes it obvious that the quality of planning and designing of housing units is not restricted by an extensive planning framework and its threshold and target values. These values are part of the *programme* and they do not prompt specific designs for the layout of a settlement nor do they promote specific architectural solutions for the residential units (compare the rather different urban design schemes of Vauban and Rieselfeld in chapter 5, section 5.3 of *Urbanising Suburbia – Final Report*). The design framework adopted at Vauban regulated the general layout and infrastructure of the urban quarter, the net dwelling density, and the minimum and maximum height

of residential buildings, but specifically *excluded* any architectural design guidelines regarding type of design, choice of materials and colours, and landscaping. Individual architects could therefore shape their schemes as they and their clients wished. This produced a built environment with a stimulating level of visual-formal variety.

To conclude: the *Handbook* presented in this document is the equivalent of a planning framework for both the development and the regeneration of urban quarters. As a result of time and resource constraints, the investigation focused on built form, social and socio-economic characteristics and had to exclude environmental/ecological issues. The research team's investigation of the Freiburg schemes was based on the values listed in the *Handbook*. It was found that these built form, social and socio-economic values are, with some notable exceptions, remarkably similar to those developed for Vauban although the *Handbook's* target and threshold values were developed long before the research team made contact with the City of Freiburg's planning groups for Vauban and Rieselfeld (compare *Final Report*, chapter 5 in the *Summary Report*). The Freiburg test of the *Handbook's* built form, social and socio-economic values corroborates their relevance and applicability in live projects.

To overcome the problem with values lacking the support of empirical evidence, the research team suggests that a new research team ought to carry out a comprehensive and systematic investigation of as many UK and European best practice residential schemes that have been developed on the basis of sustainability concepts and values, and to carry out a post-occupancy analysis to ascertain which built form, social, socio-economic and environmental/ecological threshold and target values have succeeded to produce a measurable improvement of the living quality of residential areas in comparison of conventional schemes. This investigation has to be carried out using a tool similar to that developed by the *Urbanising Suburbia* research team to guarantee consistency of comparison and measurement of the levels of sustainability of urban regeneration and development schemes. This way empirical evidence of the effectiveness or otherwise of target and threshold values will be forthcoming.

References

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