

## 3.22 Sustainable urban development

In this section you will learn about:

- ◆ the environmental impact and ecological footprint of major urban areas
- ◆ dimensions of sustainability: natural, physical, social and economic
- ◆ the nature and features of sustainable cities
- ◆ contemporary opportunities and challenges in developing more sustainable cities

### The impact of urban areas on local and global environments

Throughout this chapter you will have learnt that urban areas have a marked impact on both local and global environments. High densities of people and buildings compete for space and consume vast quantities of water, energy and other resources. There are also problems of air pollution, traffic congestion and waste disposal. By developing the **ecological footprint** concept (the area of land needed to provide the necessary resources and absorb the wastes generated by a community), the impact of cities on the environment can be highlighted dramatically (Figure 1). For example, in the first such analysis (2002) of a major world city, London's ecological footprint turned out to be 120 times the area of the conurbation itself! Indeed, such are the needs and demands of urban populations in HDEs that their ecological footprints are more than ten-times those of people living in similarly sized urban areas in LDEs.. In short, urbanisation nowadays is so important and dominant that any hopes of approaching global sustainability depend on developing more sustainable cities.



Figure 1 The urban ecological footprint

### Sustainable cities and liveability

Sustainability simply means meeting the needs and hopes of today without messing up the future! In effect, making the best use of resources, protecting the environment, controlling growth and waste – all of which have an acute relevance to urban lifestyles. But, it is the concept of **liveability** that best describes the natural, physical, social and economic dimensions of sustainability in an urban context. It has been a buzz word in city development for some time – it encapsulates that understandable urban ideal of collectively improving everyone's quality of life both now and in the future (Figure 2). The truly liveable, sustainable city might well prove to be an impossible dream, but careful planning and management can certainly take us a long way towards it.



Figure 2 What does 'liveability' mean to you? The size of each word is proportional to the number of times it occurred in all responses to a Twitter competition to define liveability run by the San Francisco County Transportation Authority.

**Did you know?**  
The ecological footprint of the Tokyo metropolitan area has been calculated to be almost three times the land area of Japan as a whole!

### The nature and features of sustainable cities

- ◆ Greener built environments: using energy and water more efficiently, reducing MSW and managing it better (see 3.19 and 3.20).
- ◆ Improved transport: developing infrastructure, networks and **modes** to meet demand without increasing congestion and pollution. Everything from excellent public transport to vehicle restrictions and technical innovations can be considered (see 3.16). The new term 'livable communities' stems from this ideal – what the US Department of Transport defines as 'transportation, housing and commercial development investments ... coordinated so that people have access to adequate, affordable and environmentally sustainable travel options'.
- ◆ Planned expansion: encouraging 'compact cities' rather than uncontrolled and unrestricted urban sprawl. Developing brownfield sites is hugely significant (see 3.21).
- ◆ Conserving buildings and open spaces to be used and enjoyed by everyone: restoring important historic buildings, brownfield clearance to create new green spaces and protection of existing open spaces. Improving biodiversity within urban river systems and ecosystems is important in this respect (see 3.19).
- ◆ Carbon-neutral development: building structures such as houses that generate as much energy as they use – so reducing pollution. Beddington Zero Energy Development (BedZED) in Hackbridge, London is an example of this (Figure 3).



**Figure 3** BedZED consists of 82 'affordable' homes, 18 workplaces, retail and leisure areas. It includes a children's nursery, medical centre, sport pitch, exhibition centre, offices and meeting rooms. The scheme includes a biomass-combined heat and power plant, an onsite sewage treatment and rainwater recycling system, and natural wind driven ventilation.

### Contemporary opportunities and challenges in developing more sustainable cities

All cities are unique. All offer enormous potential for positive change. But as more people live and work in them, prosperity increases and better transport is demanded, and more energy, goods and food are consumed. This generates more pollution and waste unless the opportunities to develop more sustainable cities are embraced.

This inevitably presents challenges:

- ◆ Political will: there needs to be long-term strategic planning, 'joined-up' thinking involving all relevant **stakeholders** including governmental departments. Given the short-term thinking that dominates most government – particularly in democracies – this is not a straightforward as it seems.
- ◆ Globalisation: the inter-connectedness of cities within the global economy has increased the power and influence of TNCs. These large and powerful companies must, therefore, also embrace the need for change.
- ◆ Economic gains for all: there must be economic incentives for both the wealthiest and poorest if positive change is to happen. Sustainable cities must be inclusive.
- ◆ Climate change: sustainable cities must stimulate economic growth without increasing greenhouse gas emissions.

#### Did you know?

In 2010, the San Francisco County Transportation Authority held a competition on Twitter to answer the question: What does 'liveability' mean to you? The elegant, rhyming six-word winning definition was 'accessible places, natural spaces, minimal traces'.

**Strategies for developing more sustainable cities**

This is an exciting age to be a Geographer, not least for those involved in urban planning. Throughout the world, there are examples of innovative, positive management of sustainable urban change. We now live in an information age, where the internet and globalisation spread knowledge efficiently, so the best strategies for achieving greater urban sustainability can be understood, evaluated, copied and adapted according to need (Figure 4).

**Figure 4** Globally influential examples of strategies promoting urban sustainability

Strategy to promote urban sustainability	Example
Greener built environments – to create greener built environments that use water and energy efficiently, reduce urban waste and increase recycling	<i>Quezon City, Philippines</i> An inclusive approach to the management of MSW has been adopted including raising awareness of recycling in local communities and schools. This has led to a 38 per cent reduction of MSW deposited in landfill
Improved transport – to expand and develop existing transport infrastructure and networks to meet demand	<i>Vitoria-Gasteiz, Spain</i> Bicycle lanes, an expanded public transport network, car sharing and charging points for electric vehicles and have all been introduced (Figure 5)
Planned expansion – to encourage ‘compact cities’ and planned expansion, rather than uncontrolled and unrestricted urban sprawl	<i>Nantes, France</i> This was the first city to successfully reintroduce electric trams as part of its public transport system. This has helped to decrease commuter traffic on the roads and encourage reurbanisation (urban resurgence)
Economic opportunities – to provide a range of local economic opportunities, including new opportunities in a ‘green economy’	<i>San Antonio, Texas, USA</i> 125 ‘green jobs’ created as a result of the success of the city’s recycling programme
Conserving buildings and open spaces – to protect existing, and create new, green spaces that are valued and made use of by all members of the community. And to support high levels of biodiversity within urban ecosystems	<i>Queen Elizabeth II Olympic Park, Stratford, London</i> As part of the sporting complex built for the 2012 Summer Olympics and Paralympics, this brownfield regeneration includes the creation of 100 hectares of new urban park along the River Lea. The new <i>wildlife corridor</i> , links Hackney Marshes to the north with the Thames – otters are now able to move freely for the first time in a century
Carbon-neutral development – to remove as much carbon dioxide from the atmosphere as was put into it in construction – a zero carbon footprint	<i>BedZED, Hackbridge, London</i> Beddington Zero Energy Development (BedZED) was completed in 2002 and built on a brownfield site. It is the largest zero-energy and carbon-neutral urban village development in the UK (Figure 3)

**Freiburg: a sustainable city**

The German city of Freiburg (Figure 6) set itself the goal of urban sustainability as early as 1970. Natural, physical, social and economic dimensions of sustainability were central to the plans. For example:

- ◆ Green spaces are both protected and enhanced. Forty per cent of the city is forested with over half of these woodlands protected as nature conservation areas. Only native Black Forest trees and shrubs are planted. Furthermore, excepting flood retention basins, the River Dreisam is unmanaged and so provides natural habitats for flora and fauna.
- ◆ A sustainable water supply harnesses both rainwater harvesting and wastewater recycling. Groundwater is the city’s most important source of drinking water and so has to be protected from pollution. In consequence, Sustainable Drainage Systems (SuDS) including green roofs, permeable road and pavement surfaces, and bioretention basins are widespread (see 3.18).



**Figure 5** Charging points for HEVs, PHEVs and EVs are increasingly common, especially in city centre car parks

- ◊ MSW is reused and recycled as much as possible. There are 350 community collection points for recycling, a biogas digester processes all food and garden waste, and energy for 28 000 homes is produced by incineration.
- ◊ Social dimensions include the provision of 'affordable' energy-saving homes and locals are encouraged to invest in renewable energy resources. In addition to the financial dividends, investors receive free football season tickets!
- ◊ Economic dimensions include the creation of 10 000 jobs in 1500 environmental businesses. Over 1000 people are employed in solar technologies – in research, development and manufacture of solar energy systems including solar panels (Figure 7).



▲ **Figure 6** The location of Freiburg, Germany



▲ **Figure 7** Freiburg in the Black Forest has around 400 photovoltaic installations; this truly 'green city' is a leading solar energy capital

## ACTIVITIES

- 1 Approximately 80 per cent of the population in HDEs live in urban areas (compared with around 50 per cent in LDEs). To what extent is the aim of achieving sustainable cities less of a challenge for HDEs? Explain your answer fully.
- 2 Suggest reasons why achieving the goal of a sustainable city necessitates long-term planning solutions to economic, social and environmental problems.
- 3 Examine to what extent 'liveability' is synonymous with 'urban sustainability'.
- 4 Calculate your ecological footprint in order to understand which areas of your lifestyle have most impact on the planet. Which behaviours will you (realistically) be able to change? Internet search engines have many examples of interactive quiz activities that will enable you to do this.

## STRETCH YOURSELF

Evaluate the claim that Freiburg is a truly sustainable city.