were divided into five groups: *mega-cities* (Tokyo and Osaka); *semi-mega cities* (including Yokohama and Kyoto); *local cities* (populated by around 1 million inhabitants, including Hiroshima and Nagasaki); and two groups of *smaller*, *regional-centre cities* (which include Aomori and Nagano, and Nara and Wakayama). The characteristics of each grouping of cities will be discussed, and the methodology behind the categorization of the cities will be described. The intensity of the relationships between density and accessibility in these cities will be analysed by correlation analysis. Finally, conclusions will be presented regarding the implications that high densities have for levels of accessibility and the quality of life of urban residents, as well as some comment offered on the applicability of density as an indicator for accessibility.

The compact city and sustainability

It is generally accepted that high residential density is an essential element of the compact city. According to Burton, 'the so-called compact city … is taken to mean a relatively high-density, mixed-use city' (2000, p. 1969). Burton goes onto argue that high densities, along with a good public transportation infrastructure, which encourages people to walk and cycle rather than to drive their cars, go some way towards realizing aspirations for the sustainable city. These aspirations are based on sustainable urban development, defined in the *Brundtland Report* as meeting 'the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987, p. 43). Elkin *et al.* (1991) list four underlying principles of sustainable urban development: futurity, environment (in that the full environmental costs of all human activities must be taken into account), equity (that there should be equitable access to resources for all) and participation (referring to a democratic process in decision-making that affects the population). It is this third principle, that of equity, which is the primary focus of this chapter. What is the relationship that the high density of the compact city has on accessibility to local facilities?

The compact city and high densities

Travel behaviour which suits urban life, mostly, in the compact city would consist of sustained public transport use, walking

and cycling, and minimal car use. A high-density urban form can incorporate such sustainable travel behaviour easily, but may not adequately support the individual car driver. However, many cities suffer from high congestion and air pollution because of the prevalence of the car as the primary mode of transport. A public transport system, which links up with opportunities for walking and cycling, that realistically reflects the needs of its residents and workforce in getting them where they need to go, quickly and efficiently, is an essential and complementary component of the compact city.

It is also well cited that the high-density urban form is favourable to the convenient location of local facilities. The high-density, mixed-use urban model has been strongly advocated in the pursuit of the sustainable city, and is dependent on good local accessibility for residents to the services and facilities that they use on a day-to-day basis. Thomas and Cousins state that the components of compact urban forms which typically consist of a high-density development area 'approximately 5–10 minutes' walk (about 400–600 m) from the centre to edge' up to one mile from the nearest 'central public transport stop' (1996, pp. 328–329). The centre of such a development area should contain services and facilities, such as food shops, schools, a doctor's surgery and public space (Barton *et al.*, 1995). The Town and Country Planning Association (TCPA) in the UK go further than this, asserting that 'accessibility to facilities should be the guiding factor in moving towards more sustainable forms of development rather than density *per se*' (Gossop, 1990, p. 342).

Reducing the need for private transport use is one of the aims of sustainability. By increasing residents' accessibility to services and facilities through situating them locally could reduce transport use. If appropriate local facilities are located within walkable distances from the home, the necessity of owning and using private cars is diminished. It, therefore, follows that the most efficient way in which to make this work, is by ensuring that the densities of urban areas are:

1. **high enough to support the services and facilities locally provided (including the transportation and infrastructure)**
2. **large enough to attract employers to the area to capitalize on the workforce in the area**

It is a cyclical process: if people use and support the services in the area, more employers will move into the area further supporting the area, increasing the need for quality public