

urban sprawl and preserve open space. This research was inspired by the installation of a functional sculpture in Rotterdam, the *Bamboo Summit City*. Hulshof outlines design proposals for high-density Dutch cities which have a considerable amount of unused roof space. These proposals show how existing urban roof-top areas can be transformed to incorporate workable ‘uppercities’.

The final three chapters consider how sustainable development can be achieved within a low-density context. Bartuska and Kazimee discuss how principles of sustainable planning and design have been applied to the small town of Pullman in the USA. The study models the ecological (or biological) variables including air, water, food, energy and human ecology as primary indicators of sustainable community development. Strategies were established at different spatial scales, corresponding to the differing needs of the region, the city, the district and neighbourhood, down to the design of the dwelling unit. The authors suggest that as this regenerative proposal is based upon an holistic model of sustainability, the principles demonstrated in Pullman can be applied to other larger urban areas.

The following chapter concentrates on sustainable development in the low-density town of Bozeman in the USA. Johns presents strategies and design prototypes, which, he suggests, illustrate how a low-density town within fragile environmental surroundings can be made more sustainable. Bozeman is located in the Gallatin valley where, because of the fragility of the natural environment, the majority of future development will be limited to existing settlement areas. Johns admits that the proposals put forward are quite modest, and correspond to American individualism and the consumer-driven market-based system. Some of the proposals discussed by Johns include a pedestrian-oriented neighbourhood centre, commercial area infill and the development of low-density residential clusters.

The final chapter in this section, by Webster and Williams, reports on a design project undertaken by staff and students of Cambridge University and the Massachusetts Institute of Technology, called the *Cambridge Futures Project*. Through a design case study process, issues raised by the creation of sustainable rural communities in the Cambridge region were closely scrutinized. The aim of the project was to examine whether innovative change in public policy and spatial design could create sustainable environments. The authors examine some of those changes including the establishment of a charitable trust as opposed to developer-led action. The result

provides a clear vision for a future sustainable settlement according to Webster and Williams, who highlight how the design of the physical infrastructure can make an important contribution to long-term environmental sustainability as well as providing a sense of place for residents.

### Section Three

The previous sections offer some holistic arguments for achieving sustainable development, and illustrate how different urban forms have particular requirements that must be taken into account for sustainability to occur. There are, however, other aspects which can have an impact on the design of the sustainable urban form. This section considers some of these aspects which include changing work patterns, renewable energy use and assessment of the sustainability of high-rise buildings.

Despite being a ubiquitous term often used in definitions of the ‘compact city’, the term ‘density’ is surprisingly little understood. The chapter by Jenks and Dempsey attempts to demystify the meaning of density by tracing some of the ideas behind housing density standards in the UK. The authors highlight the difficulties in measuring density, due to the fact that there being no common methodology or definition. When analysed over time, the key government documentation provides density standards, especially for ‘high’ densities, that have remarkable similarities, and yet the recommended urban forms associated with the standards vary enormously. An explanation for this variety is suggested: density is a relative concept that is culturally determined, depending on the dominant contemporaneous ideas of the time.

The next chapter by Kaido continues the discussion of density, with regard to research conducted into high-density living and the relationship it has with accessibility. One of the claimed advantages of compact, high-density development is that facilities are more accessible, thus reducing the need to travel. This chapter draws on research from Japan which compares densely inhabited districts in 49 cities. The results show that there is an inherent danger associated with relying on simple theories when applied to the complexities of real urban environments. It is not enough to make the assumption that high density will, by default, lead to high levels of accessibility. Kaido argues that there are other variables that need to be taken into account, such as planning policies and car ownership, as they