site-specific adversarial approach to one that is more contextual, and consensus based. This approach should enable the development of a new model for the sustainable intelligent city, incorporating an understanding of the management of overlapping functions, and the potential for intensification of space and time. The aim would be to create a framework to allow for local action that is integrated into city-wide, regional and indeed global visions.

In this chapter a series of strategic questions will be posed and answered in order to define what is meant by 'city intelligence'. An attempt will be made to reposition the concept of the intelligent city, decoupling it from issues of digital infrastructure and information communications technology, and instead to re-align it with a broader approach that embodies longer-term issues and sustainable values. To do this, the notion of the intelligent city will be examined from a number of perspectives, which are organized into three parts. Firstly, the derivation and definitions of city intelligence will be established. Secondly, the link between intelligence and sustainability will be discussed as will the extent to which both concepts overlap. The implications for urban intelligence of the new economic context defined by the knowledge economy will also be examined here. Finally, the implications for policy and the development process are outlined, including a review of some indicators for measuring city intelligence.

Intelligent city definitions and derivation of its concept

The concept of 'city intelligence' can be and has been interpreted in many different ways: from referring simply to the level of digital infrastructure provision to the idea of the city as a functioning being in and of itself, capable of autonomous reaction to stimuli. This relationship with the provision of digital infrastructure arises largely through the derivation of the concept from studies concerning intelligent buildings. The first applications of the term 'intelligent building' in the 1980s were extremely technocentric, and it was only towards the end of this decade that the concept began to be expanded beyond technological terminology.

A series of 'intelligent building' studies carried out during the 1990s by design consultancy DEGW and others, examined the effectiveness of buildings to provide environments suited to

the changing nature of work, and the changing real estate priorities of international corporations (DEGW, 1992, 1999; Harrison *et al.*, 1998). The capacity of buildings to cope with the increasing requirements for integrated digital information and communications technology played a part in this; however, over the course of the studies the emphasis slowly changed. Building intelligence was redefined:

> . . . in a way that focussed on how buildings and technology can support an organization [and that] ... the building technologies should serve the needs of the occupants rather than controlling or limiting them.
>
> Harrison *et al.*, 1998, p. 134

More importantly, a pivotal aspect that these studies introduced to the concept of building intelligence was the issue of responsiveness to change:

> In the IBE [Intelligent Buildings in Europe] method the building shell is rated in terms of one overall characteristic – its adaptability to meet changing needs over time. This is seen as fundamental to the concept of building intelligence . . .
>
> Harrison *et al.*, 1998, p. 134

This final intelligent building study decoupled the definition from the requirements of IT, stating that 'an intelligent building does not have to involve high levels of technology' (Harrison *et al.*, 1998, p. 146). Instead the study related building intelligence to location, including issues of ease of access and the level of local amenity provision. This evaluation enabled the definition of four intelligent building types, shown in Figure 2.1.

The study also began to examine how the concept of intelligence might be extended out beyond the building to describe a wider area. Intrinsic to this concept was the idea of the organization as a network, as business organizations dispersed themselves and their functions around buildings, so they would need an 'intelligent area' in which to function (Figure 2.2). This was interpreted as suggesting that intelligence operates across a range of scales, from a single building to a multiple city region (Figure 2.3).

The definitions from these studies have two basic flaws when applied to the wider area:

- They retain a technocratic (or digital) focus
- They focus on the requirements of business organizations