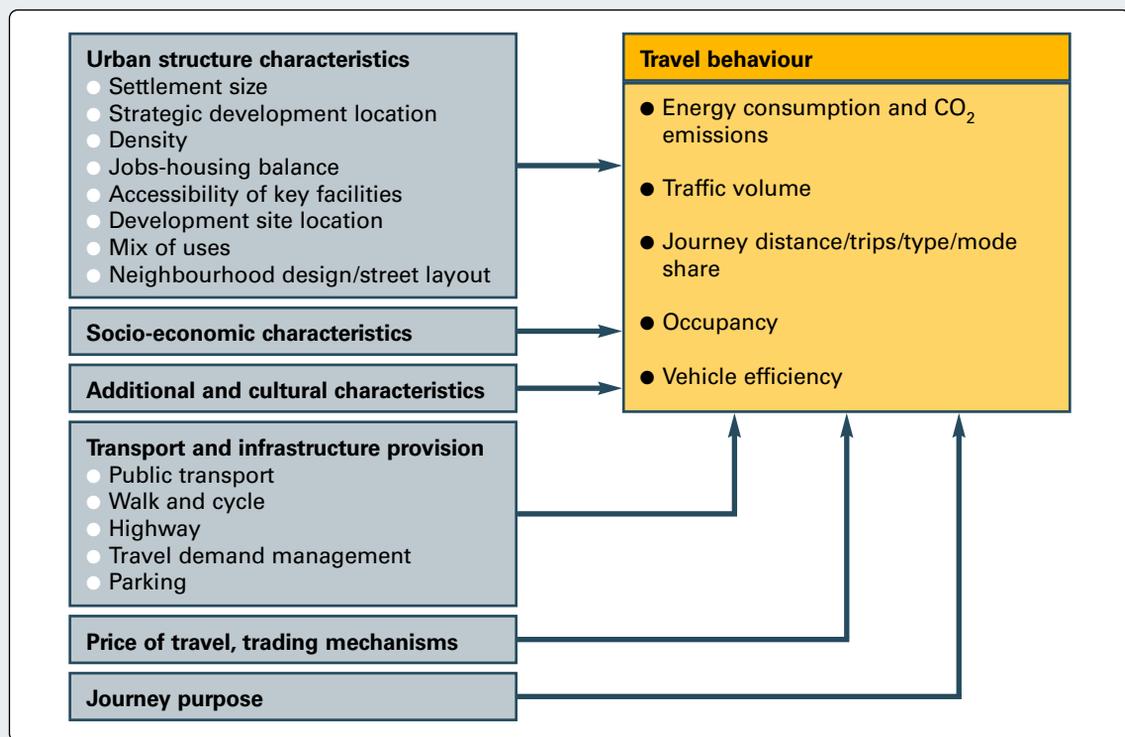


spatial planning for sustainable travel?

Robin Hickman, Catherine Seaborn, Peter Headicar, David Banister and Corinne Swain consider the crucial role of spatial planning in reducing the demand for travel

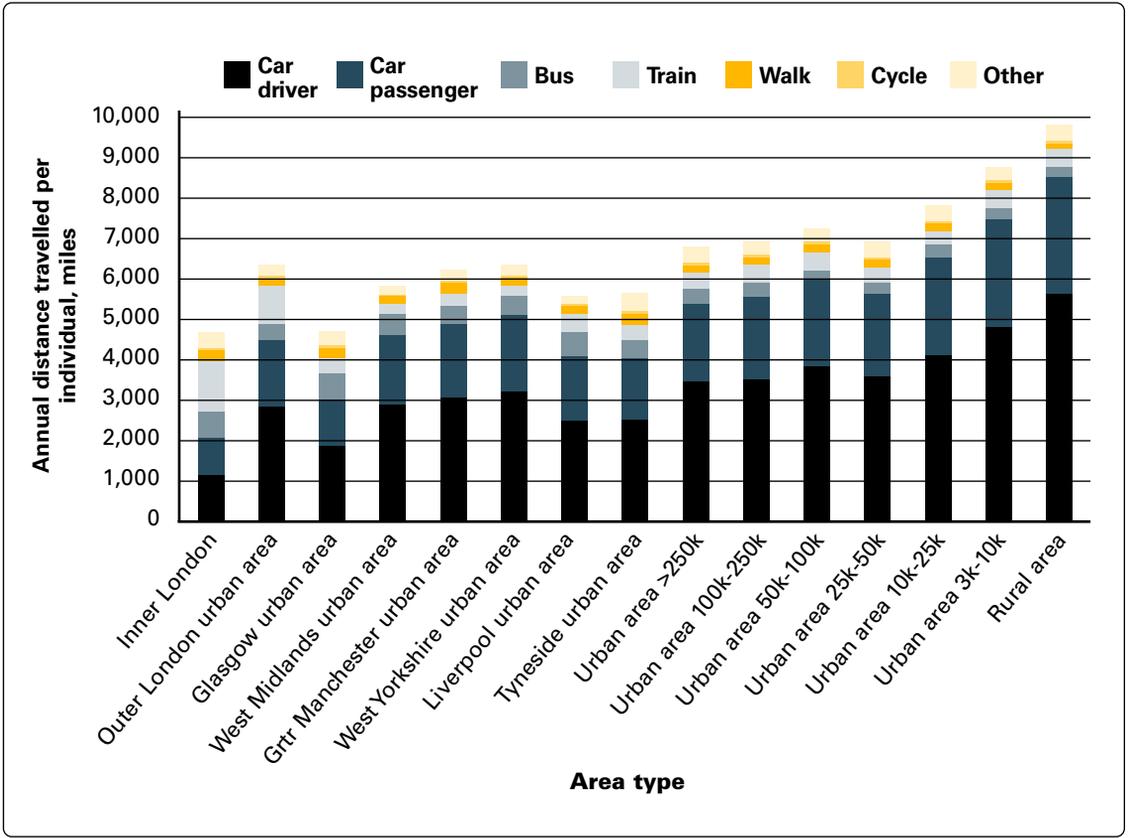
Urban structure and mobility appear to be inextricably linked, and their effective 'integration' has been the subject of much debate over the last 30 years.¹ The location of all activities – for example homes and workplaces and other activities – provides the 'physical rationale' for travel. Other factors contributing to the demand for travel include

socio-economic characteristics (such as income, household structure, car availability), attitudinal characteristics (the disposition of people to particular modes of travel and locations for living and working), transport infrastructure (both 'hard' and 'soft') and trip purpose (see Fig. 1 below). The role of planning in helping to enable and



Above

Fig. 1 Urban structure as an enabler of sustainable travel



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Fig. 2 Settlement size and travel – settlement size greatly affects average distance travelled

Source: National Travel Survey, 2002-06

even achieve sustainable travel has been underestimated.

A recent study by the authors for the Commission for Integrated Transport (CfIT) has considered the relationship between urban structure and travel.² The study has illustrated the important role that spatial planning can play in enabling greater sustainability in travel patterns. It pulls together

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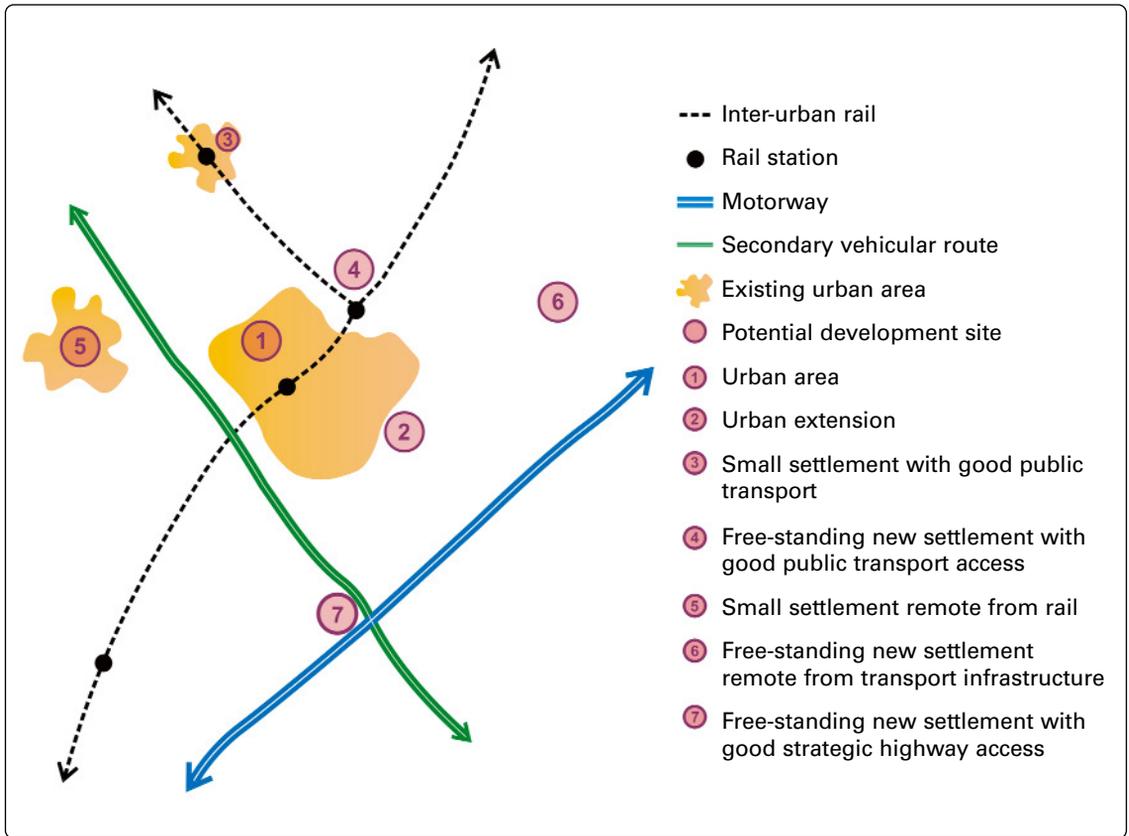
much of the earlier research on this topic, assesses some of the current data trends and the level of practitioner ‘engagement’, and makes the case that the strategic location and form of development is critical to the trips made, the modes used and the distances travelled.

There are, of course, multiple objectives in the design of development, including those of urban design, economic development and wider social dimensions. However, this work considers the issues from the transport perspective. The cumulative effect of land use decisions over recent decades has had a profound effect on travel patterns, and will continue to do so in the future. As an example, we can see the impact of settlement size on travel distance – the smaller settlement size cohorts and rural areas are associated with much higher average distance travelled per individual (see Fig. 2 above).

Principles for practitioners

So what can practitioners do? The study develops 11 key themes for using spatial planning as an ‘enabler’ of sustainable travel. These are:

- **Theme 1 – Settlement size:** Larger settlements provide a greater mix of employment, shops and specialised services. There is greater likelihood of residents finding jobs and utilising facilities, or of services drawing their employees and customers from within the same urban area, leading to the possibility of greater ‘self-containment’. This tends



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Fig. 3 Strategic development location – development location choice can differentiate between urban areas according to traffic generation potential

to lessen average trip lengths and in particular reduces the need for inter-urban travel, which at present is heavily car based. All other things being equal, the expansion of larger settlements (with a minimum population of 25,000) is generally preferable to ‘leapfrogging’ development to smaller, dispersed towns or rural areas.

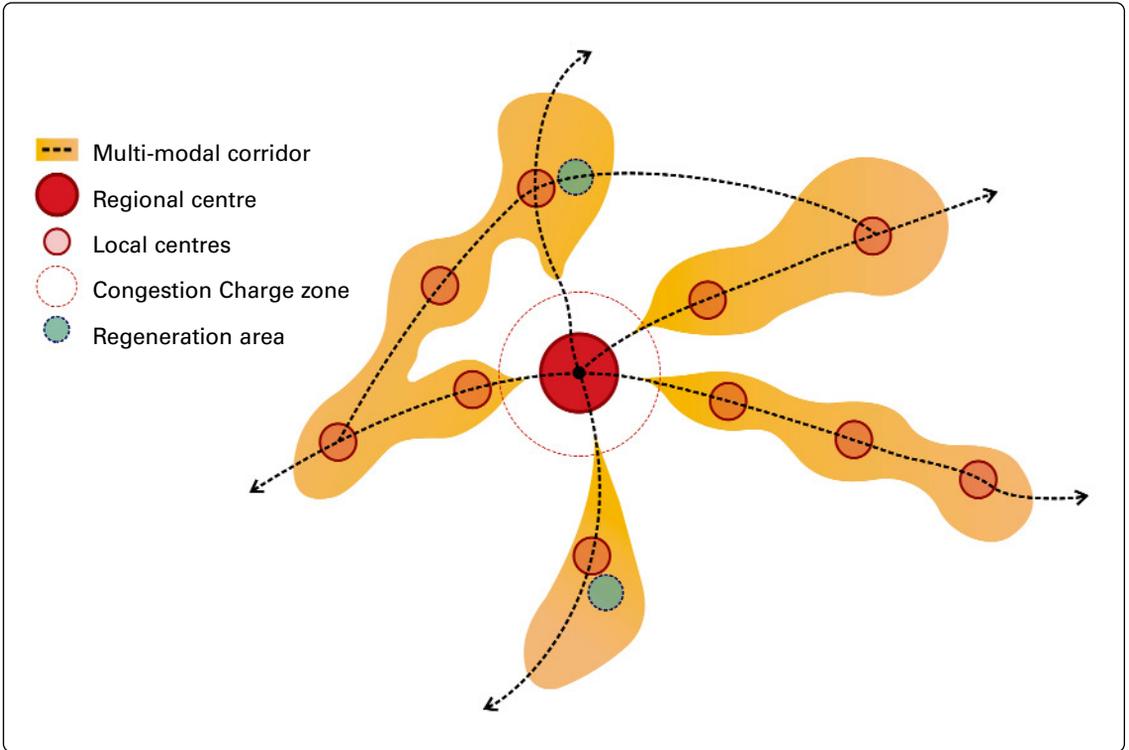
● **Theme 2 – Strategic development location:**

Areas for major new development (residential, employment, leisure and retail) within regions, including national Growth Areas and at Growth Points, are usually selected according to a range of criteria. Such criteria should include the likely traffic generation potential of different locations. The aim should be to locate development where travel by car is likely to be low, in terms of trip length, distribution and mode share, and where the use of non-car modes can be promoted, usually in locations where good public transport accessibility is available (see Fig. 3 above). This is preferable to ‘spreading’ development across a number of urban areas.

● **Theme 3 – Strategic transport network:** To reduce the growth in medium-and longer-distance

car-based travel generated between settlements, the efficiency and reliability of the existing public transport network (rail and bus) should be improved. This is best integrated with the existing and planned development pattern, resulting in the support of public transport and discouragement of the use of the strategic highway network (see Fig. 4 overleaf).

● **Theme 4 – Density:** Raising the density of development, particularly around public transport nodes, can also help achieve sustainable travel. There is major scope in town centres and also many suburban areas. This again contributes to greater scope for viable and attractive public transport services, and reduced car use in terms of both mode share and distance travelled. There is a lengthy and continuing debate over appropriate density levels. Planning Policy Statement 3 (PPS3): *Housing*³ advises a ‘working minimum of 30 dwellings per hectare’. Much higher densities can be achieved in many areas, up to 50-100 dwellings per hectare (DPH), and even 100-200 DPH plus around important public transport interchanges. Flexible density standards



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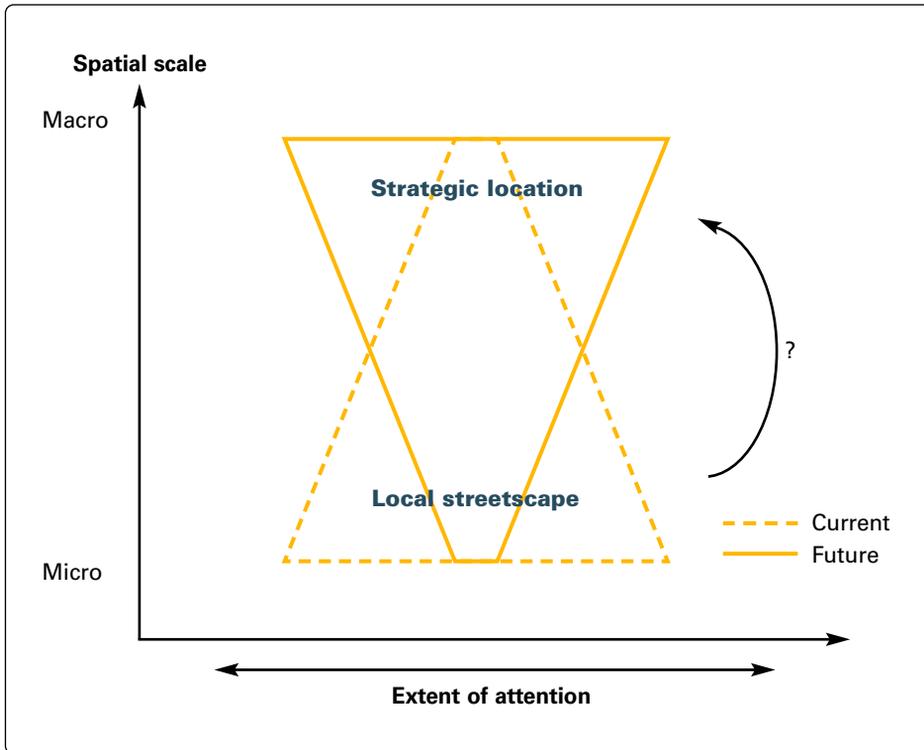
Fig. 4 Strategic transport network – radial and tangential multi-modal corridors linking the regional centre, local centres and regeneration or development areas

can be used according to each location, but minimum thresholds should be set at higher rather than lower levels.

- **Theme 5 – Jobs-housing balance:** Local employment opportunities close to residential developments will encourage the reduction of aggregate commuting distance. A qualitative match of skills and employment is required, as well as quantitative balance. Like most of the urban structure variables, jobs-housing balance is a 'necessary but not sufficient' condition for reducing travel distances. Jobs-housing balance can be achieved at different scales – at regional, travel-to-work, and urban area levels. Existing commuting patterns, planned residential and employment locations, and workforce characteristics should all be examined to ensure that there are limited mismatches which may encourage long commuting distances.
- **Theme 6 – Accessibility to key facilities:** Key facilities (homes, workplaces and other activities) should be located where there are high levels of accessibility by public transport, as well as by car. Accessibility planning is an important tool here. Priority needs to be given to established centres before considering other locations on the public transport network which offer similar levels of

accessibility. Developments outside established centres need to include a mixed-use element to facilitate multi-purpose trips, travel demand management measures, and controlled parking on-site to complement other parking restrictions in the vicinity.

- **Theme 7 – Development site location:** This includes the selection of sites for new housing or other developments, and can often be associated with transport interventions, helping to make viable new or enhanced transport facilities or to remedy existing traffic or environmental problems. Sites for development can be assessed according to accessibility by public transport, accessibility by car and accessibility to/from employment and other key facilities. Examples for larger towns include incorporating network links in the layout of development to allow existing urban bus services to be utilised and enhanced. Larger extensions may justify a dedicated bus, bus rapid transit or light rail service along a radial corridor with priority traffic measures. For small towns, development should be focused on radial corridors in order to utilise and support inter-urban bus services that run along them. The selective release of land can then be made at the edge of larger settlements, and in public transport



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Fig. 5 A greater strategic focus – the strategic locational options for development need much greater attention in terms of the propensity to generate travel

corridors, taking into account the relative accessibility by public transport.

- **Theme 8 – Mixed use:** This may be specified within a masterplan for a development area or within the brief for a particular development site. Essential community facilities (for example grocers, local schools and banks) can be located within walking distance of all homes in a neighbourhood in order to reduce travel distances. Complementary uses should be identified, such as day-care facilities, fitness centres, bookstores and cafés, and support should be given to building types which facilitate co-location, so that individuals can reach more activities per trip.
- **Theme 9 – Neighbourhood design and street layout:** This includes the scale, form and function of buildings and open space (including streetscapes) and the layout of local streets – for example as permeable ‘traditional’ grid networks. Both can have an impact on generated travel patterns. Sustainability objectives move transport planning at this scale beyond a focus on vehicular throughput, to include consideration of transport routes as ‘places’ as well as ‘links’.⁴
- **Theme 10 – Traffic demand management:** This covers a wide range of measures aimed at

reducing car use and its adverse impacts. They complement the more traditional development components of spatial planning in promoting sustainable travel, and some of the organisational initiatives involve behavioural measures (or ‘smarter choices’). Possible traffic demand management (TDM) interventions can be listed under three main categories:

- organisational and operational;
- financial; and
- infrastructure.

The land use component of spatial strategies can be strengthened with the development of a rigorous TDM strategy which sets out to enhance the overall sustainability of development. The UK Sustainable Travel Demonstration Towns’ experience⁵ illustrates the type of integrated TDM strategy that may be effective in reducing car-based travel. Such packages of interventions should be carried out in all urban areas and new developments.

- **Theme 11– Parking:** This is a central element to TDM, and should therefore feature as an integral part of spatial strategies at all levels. The use of parking is much under-utilised as a strategy to encourage less car use and improve traffic and

environmental conditions in an area. Controlling parking through the restriction of spaces, timing and pricing typically complements a variety of measures designed to promote the use of non-car alternatives, and it can be linked to giving priority to low-emission vehicles. Both the amount of parking space and the form in which it is provided (i.e. within the curtilage of private developments, in allocated or unallocated off-street spaces, and in on-street bays) have implications for the wider issues of neighbourhood design and street layout.

Thinking strategically

'Integrating land use and transport planning' is often put forward as a policy objective, but relatively little follows in practice, particularly at the strategic level – and this is the level which most affects the volume and mode of travel. Even where the internal layout of new development is good, the linkages to neighbouring areas and further afield are almost always poor. Too often, new development is spread between towns in an area, following the historical settlement pattern or more recent shifts in the residential population, rather than a close analysis of travel generation impacts. Inter-urban, medium- and long-distance trips are often poorly addressed by TDM strategies; but it is here that car-based trips have increased significantly over recent years, and are to a degree unconstrained.

'In an era where achieving sustainable lifestyles will become increasingly important, the spatial planning toolkit becomes critical'

In an era where achieving sustainable lifestyles will become increasingly important, the spatial planning toolkit becomes critical. Decisions made on the location of new development have a key impact on the numbers of trips, the modes used and the distances travelled. The key for practitioners will be to act across a range of policy levers – beyond, say, density – covering the location, form and layout of development. Alongside, we can develop traffic demand management strategies that support and are integrated with the development vision.

A key element here may be the concept of 'unnecessary mobility', where some trips can be reduced in volume relative to others which have more value. Much more understanding is required of the types of trips that can be reduced and the incentives required. The response to climate change

needs a progressive approach, recognising the importance of actions at the sub-regional scale (see Fig. 5), and breaking down the 'silo mentality' that often exists between different professional disciplines. The CfIT study output hopefully provides an easily accessible, web-based toolkit for spatial and transport planners to work with and increase their influence.

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Notes

- 1 See, for example, among many others, P.W.G. Newman and J.R. Kenworthy: *Cities and Automobile Dependence. An International Sourcebook*. Gower, 1989; P.W.G. Newman and J.R. Kenworthy: *Sustainability and Cities: Overcoming Automobile Dependence*. Island Press, Washington DC, 1999; M. Breheny: 'The contradictions of the compact city: A review'. In M. Breheny (Ed.): *Sustainable Development and Urban Form*. Pion, 1992, pp.138-59; R. Ewing and R. Cervero: 'Travel and the built environment. A synthesis'. *Transportation Research Record*, 2001, Vol. 1780, 87-114; and W. Bohte, K. Maat and B. van Wee: 'Measuring attitudes in research on residential self-selection and travel behaviour: A review of theories and empirical research'. *Transport Reviews*, 2009, Vol. 29 (3), 325-57
- 2 R. Hickman, C. Seaborn, O. Ashiru, S. Saxena, P. Headicar, D. Banister and T. Pharoah: *Planning for Sustainable Travel. Summary Guide*; and *Land Use and Transport: Settlement Patterns and the Demand for Travel. Background Technical Report*. Halcrow Group/Oxford Brookes University/Oxford University for the Commission for Integrated Transport, 2009. www.plan4sustainabletravel.org
- 3 Planning Policy Statement 3 (PPS3): *Housing*. Department for Communities and Local Government, Nov. 2006
- 4 P. Jones, N. Boujenko and S. Marshall: *Link and Place. A Guide to Street Planning and Design*. Landor, 2007
- 5 See www.dft.gov.uk/pgr/sustainable/demonstrationtowns/sustainabletraveldemonstrati5772