Foreword

INFRASTRUCTURE AND URBAN SUSTAINABILITY: LOOKING BACK AND LOOKING FORWARD

Sustainability

Sustainability has become a very prominent element in the day-to-day debate on urban policy and the expression of that policy in urban planning decisions. The heritage of this interest lies in the steady evolution of ideas concerning the environmental and ecological impact of economic development. Beginning perhaps with the work of the Club of Rome but accelerating sharply with the insights of the Bruntland report, these ideas have been enriched via the Rio declaration as the debate over climate change and the effect of green house gas emissions has developed (Low, 2000). In this current period, the role of urban areas has become a more prominent feature in the discussion, perhaps underscored by the recognition that oil shortages would influence mobility in and between cities (brought into very sharp focus by the surge in oil prices in the economic boom that peaked in 2008).

Urban Sustainability and Urban Policy

Throughout the evolution of the ideas outlined above, the concept of sustainability was refined, re-interpreted and re-expressed. These conceptual changes involved a sense that there were economic, social as well as environmental dimensions to the concerns of sustainability, all of which would be felt in urban areas. This opening up of the concept created more space to be concerned about cities and regions because local community economic outcomes reflected the ‘sustainability’ of jobs; their social outcomes rested in part on the dynamics of urban housing markets; and their environment was influenced by the car traffic that linked urban producers and residents (and reflected in air pollution, noise and other environmental outcomes). Recognition of these (and other) perspectives placed the outcomes in urban areas at the core of sustainability as a concept and as a policy concern.

The expression of that concern, and the incorporation of sustainability in an urban context, quickly centred upon density of urban form as its key consideration. There were good reasons for that focus. Much publicized work, especially that of Newman & Kenworthy (1991) in the late 1900s showed that transport energy use (and by implication, pollution and green house gas emissions) was very closely linked to urban density. Urban sprawl became an important target, not only for its effect upon energy and air pollution through car-based travel, but also because it ate into the land area at the rural fringe. These perspectives were debated then by Gordon and Richardson (1997), Troy (1996), Breheny (1995) and
Talen (1999) and remain controversial now. However, policy development followed the density focus and many locations incorporated the approaches of New Urbanism (Duany et al., 2000) and the expected benefits of the ‘compact city’ (Jenks et al., 1996). These perspectives were expressed in planning actions designed to achieve higher residential densities in new and old areas via urban consolidation, and to limit spread via urban growth boundaries.

Though these approaches do address concerns associated with sustainability, this introduction contends (along with Williams, 2004 and Lund, 2003) that they have been too narrowly focused. This judgement rests in part on the lack of concern with the location of employment in many of the current perspectives, while in practice there has been less attention to transport systems than is really needed. More fundamentally, however, there seems to be grounds to question whether a control over city form, via limits on growth and controls over housing location and density, goes to the heart of urban sustainability. Taken a step further, it is important to extend the criticisms of Talen (1999) and ask whether controls over residential density and location will determine new behaviour (or induce changes in behaviour) that would make a city more sustainable. To answer that question it is useful to think through some urban history.

Infrastructure and Urban Sustainability: An Historical Context

Examples of cities that were not sustained can be easily found. Some examples, drawn from a long view, show that mismanagement of a physical environment can lead to urban decline. Davis (2007), with reference to cities in North Africa, shows this well. More recently, we can see that changes in the fortunes of industrial activities can lead to urban collapse (as when a mining resource peters out) or slow decline (as when a city’s product loses its competitiveness or demand), as can be seen in the once prosperous, now declining textile towns of north England. Shifts in technology within a prosperous industry (especially when they reduce the need for labour) can have a similar effect, as can be seen in towns in the wheat growing areas of Australia, the US and Canada.

But there are also stories that can be written about cities that have been sustained, often over long periods. Some of these cities remain influential today. Some – such as Venice, Vienna, Bruges – are much less important than the were 550-700 years earlier, while places like Copenhagen and Hamburg have maintained significant roles (Hohenberg & Lees, 1985). Others such as London and Paris are perhaps even more important today than they were in their long distant past. Over the shorter span of time in the US, New York and Boston have been sustained from a colonial past to today (Pred, 1966). Chicago, and even Los Angeles, can be seen as places that have made adjustments to their roles and remain significant cities. A number of Middle Eastern and Asian cities, with a history stretching back two thousand years or more, show that cities can be sustained over vast periods of time, even though empires and religious influences may wax and wane around them (Abu-Loghud, 1989). Peter Hall’s (1998) magisterial work on cities and creativity provides another array of examples of how waves of creativity, allied to technical skills, have sustained many cities over time.

It is important to think what might be central to this disparate set of urban experiences. It seems that a strong element of their sustainability is a capacity to change, evolve and adapt. Over time, some of these sustained cities have been sea ports, industrial cities, religious centres and political powers – sometimes being one thing in one era and something else in another. Others were able to play more than one role at a time. What lies at the heart of this capacity to adapt and change? A range of factors can be in play. In some cases there might be a fortuitous event such as winning a war and gaining an empire. More commonly, openness to the rest of the world, contact with a variety of alternative sources of ideas,
and flexibility and tolerance in local social contexts seem to be critical: a theme well captured in Janik and Toulmin’s (1973) book that traces the rise in the influence of Vienna. Added to this, a capacity to organize urban activity seems critical.

The latter capacity is well reflected in the construction and management of infrastructure. It was the infrastructure of the ports in London, Amsterdam, Hamburg and Copenhagen that laid the basis for their contact with the rest of the world. Later it was the infrastructure of railways and then airports that maintained this openness and contact with surrounding regions and the rest of the world. It is interesting to observe that London and Amsterdam have ‘lost’ their port functions, but have adopted the infrastructure now needed for global contact – the airport; these two cities accommodate two of the world’s busiest airports. In the new world, it has been the ‘gateway cities’ (Burghardt, 1957) where shipping services made first contact (and were later connected to regional rail networks) that have become key initial cities; several of these – New York, Shanghai and Sydney – have sustained their influence over time.

The externally focused hardware of ports and railways was not enough to ensure sustainability, however, and it is easy to find places that once were important ports, or even railway junctions, that have lost that function today (Liverpool, perhaps, being a good example). What was really needed was the capacity to organize social, economic and political institutions that could enhance the economic role of the city, so that the capacity for innovation and change could be cemented into sustainability. One way was to create institutions to manage and direct trade and financial negotiations. These appeared first in Amsterdam, then in London, when both were world leading port cities (Bernstein, 2008). Some of these institutions have gone on to act as global functions. For example, London maritime services activity spread from coffee shops into dedicated buildings for Lloyds of London (Wright & Fayle, 1928) and the Baltic Exchange (Barty-King, 1977). These buildings were the precursors of the London Metals Exchange, the London Stock Exchange and a range of other, now globally significant institutions that shape activity in the City of London. In Chicago, the development of the Chicago Board of Trade (at a time when Chicago was the world’s leading centre for the sale and transport of grain) is another example. As Cronon (1991) has shown, the Board of Trade – occupying a building in the Chicago CBD – remains a major function of that city even though the physical trade in grain moved elsewhere a long time ago. Antwerp’s role in the world precious metals trade has similar origins. These examples relate to organisational skill and perception of the need for new institutions. These cities also developed the local skill base, design capacity and financial resources to build physical infrastructure for local transport networks, water and (later) sewerage systems, and to plan new urban areas. Lampard (1955) illustrates this outcome in the simultaneous technical change in industry, social and political re-organisation and infrastructure development in the rise of Manchester.

An expression of this outcome can also be seen in the creation and development of universities in commercially successful cities. The sustainability of Boston, London, Manchester, New York, Pittsburg and San Francisco is in no small way due to the commitment of a local community (and in a few cases a wealthy entrepreneur) to build institutions that mirrored what had been an important part of the development of Oxford, Cambridge, Heidelberg, Paris, Padua and some other European cities. In many of these cities, the universities are still prominent centres of activity. In the case of Boston, for example, Glaeser (2003) has argued that the education sector, represented in the universities it developed over the past 200 years, can be seen as the major economic sector currently maintaining sustainability in a long range economic history that has seen different sectors influential at different times. Of course, in this and other sustained cities, the provision of buildings for education was matched by other important elements of social and community infrastructure such as hospitals, libraries and city halls. Today, we analyse and
interpret these different responses as examples of ‘hard’ and ‘soft’ infrastructure (Malecki, 2002). The key lesson is that the sustainability of these cities rests upon a capacity to organize and manage a mix of the two types of investment that not only suit the economic and social context of the time but can be adapted to cope with future change.

Infrastructure Planning and Our Sustainable Urban Future

It is interesting now to think through the current ecological and environmental concerns associated with sustainability from this historical perspective. As noted above, our current policy perspective is based on the idea that we can shape a city’s development and vitality principally by containing and constraining the density and location of its residential development. The historical perspective, on the other hand, alerts us to the need to give much more attention to the way our investment in infrastructure is central to our capacity to invent, innovate and adapt.

Again, using the example of educational institutions, this could involve applying investment in their facilities and recognizing them as a focus for public transport network development, so addressing the energy and environment concerns of car use. This perspective could be extended to hospitals and other significant community assets. Here we would need to understand and foster the connectedness of these institutions one to the other, the role they play in community activity, and re-think management strategies to encourage the movement of staff and students between institutions and into their surrounding commercial and social community. In turn, we would need to be more sensible in the location of these activities and avoid the selection of isolated green-field campus sites that was common in the location of educational and health institutions in Australian cities over the past 30 or so years. While this may require controversial land use purchases in established areas, it will only be through such decisions that the underlying operation of the urban area will be made more sustainable.

This discussion shows that the planning of the transport system will be critical to shaping long term sustainability because of the role the system plays in the connectedness that is central to the economic and social networks spun around sustainability. History has shown that transport – be it global, regional or local – is the key to the mobility of a population, and that mobility shapes the city’s vitality and creativity. The basic idea is to locate the transport infrastructure (and the services it provides) in coordination with the key economic, social and community infrastructure. The nodes and links that are created would then attract residential development. So, rather than controlling urban development and adding the transport, the more effective way is to shape the transport system around the key institutions, and then apply the residential location planning that is currently the starting point of the process. Thinking along these lines puts physical and social infrastructure planning at the top of the agenda of urban policy.

Infrastructure Planning and The Modern City

Although this backward look can provide insight into the special role that infrastructure can play in influencing the sustainability of cities, we will need to recognize differences in the way that it is organised and managed as we deal with a different future. What we have learnt from history is that large, centrally-managed systems were an effective way of supplying our needs for water, energy, sewerage and transport. That history was built upon technical expertise that developed and refined steadily as the standards expected in cities rose over time. It was also connected to public ownership, and to management approaches that drew upon the economies of scale available in large-scale provision. In an urban
context, this experience emerged and was refined when most cities had one strong centre. Typically, services could be found dotted in and around these centres, their presence underscored by large-scale administrative offices of each service. The centralised community service suppliers, especially the big hospitals and the long established universities, could also be found nearby.

There are new circumstances to deal with today. In most cities the old mono-centric city has begun to be replaced as urban spread adds large numbers of people and jobs to middle and outer suburbs. There are strong links between these suburban jobs and suburban housing; in most cities, trips across the suburbs are more numerous than trips to the centre. That travel is not all for work. The education, health, retail and other service suppliers attract substantial movement as cities have become polycentric. With this polycentricity they have also incorporated greater diversity, with some sub-regions specializing in certain activities, and in housing sub-sets of the population.

The polycentric network calls for different models of infrastructure provision. Smaller units in sub-regional networks are potentially more effective at meeting the new pattern of demand, as diseconomies are felt when the original, large systems attempt to reach out into very much larger service areas. These smaller, regionally focused units have greater potential to enhance sustainability as they can mould and change to meet the particular needs of particular parts of cities. For example, when taken to the limit, this approach could see every house and commercial building collect and use solar energy and store its own rain water. These smaller units may also be more sustainable in a physical sense, placing less call upon resources in construction, and perhaps being easier and simpler to maintain and re-engineer as needed. In this way, the regionally and locally focused systems will themselves be ‘sustainable’ as they are in tune with needs and can cope with change.

Thus, regional transport networks, water supply and sewerage systems and networks of regional hospitals, universities and upper secondary schools – all connected to the needs of a population in a part of a metropolitan area – can together provide the foundation for a more sustainable urban future. These designs for the future layout of population, employment, community services and infrastructure supply can provide a more open-ended, regionally sensitive and potentially more flexible response for handling future urban development. At the same time, this framework opens up an exciting and challenging agenda for infrastructure planning, especially as some of the activity will involve retrofitting and re-alignment of the current monocentric systems. Those participating in the design and application of that agenda will face many problems. However, as they do, they might draw inspiration from the fact that infrastructure suppliers have re-shaped cities and given many of them sustainable futures. It will be exciting to participate in another round of decisions that has the potential to provide a rich response for a future generation.

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REFERENCES


