The Sustainable City: Transport and Spatial Development

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The term ‘sustainable city’ may have different meanings depending on the stage of development of a city. Within the growing economy of a developing country, for example, ‘sustainable’ means the ability to control spatially sprawling suburbanization. Within a developed country and taking a region such as California it may mean ‘smart growth’. Within mature economies with stable populations, such as some regions of Europe, it means regeneration of cities by attracting the population back to revitalized city centres – a process essential to maintaining a nation’s economy. Beyond Europe, Japan’s population is beginning to decline despite its being regarded as one of the most typical growing countries in the latter half of the twentieth century. Planned ‘de-suburbanization’ is now sought to fill the void within the country’s built-up areas and the resulting shrinking income, thus maintaining sustainability.

The sequence of papers in this special issue is more or less in order of stages of urbanization from the declining city, to stable city, then to the growing city: Nagoya (Japan), Amsterdam (Netherlands), Edmonton (Canada), and cities in California (USA).

Hayashi and Sugiyama argue that sustainable land-use and transport policies should be decided on the basis of stages of urbanization. In their paper, the city of Nagoya is taken as an example of a Japanese metropolis, within a developed country, whose population will, within a century, be half what it is today. In this transition period Japan is confronting low economic growth, local and global environmental pressures, as well as financial constraints on government.

Consequently various social systems are being reconsidered and the paradigm for land-use and transport planning is to change simultaneously. This paradigm shift from ‘predict and supply’ to ‘predict and manage’ is to sustain an equitable quality of life, while at the same time satisfying the environmental and financial constraints of the government. Following this shift, analysis procedures are also to be changed from ‘forecast’ to ‘back cast’, and it becomes important that a variety of components maintaining people’s quality of life be satisfied. In terms of the building stock in cities, the principle should be changed from ‘scrap and rebuild’ to constructing buildings which create social capital and consider such factors as urban landscape, lifecycle and environmental costs.

Following this paper, the two papers (Tomita et al. and Kato et al.) analyse urban land-use structure and the reconstruction of street blocks, respectively.

Using a land-use and transport model for the case of Nagoya, Tomita et al. analyse how we can make built-up areas more compact and how much we can gain by doing this. Until the 1980s Nagoya grew very rapidly and the city sprawled into the suburbs. In future, as the population declines, the city may face urban decay in the existing built-up areas due to flatter income distributions. Maintenance of infrastructure would also be a problem because of an increase in the per capita costs as the population declined. In order to avoid such a crisis scenario, built-up areas should retreat and become smaller. In this paper, the potential for making built-up areas more compact together with the
introduction of a housing subsidy in the city centre is 'backcasted'. Also, the financial saving effect for improving/maintaining infrastructure is estimated. It was found that these savings, to a large extent, could cover the cost of the housing subsidy.

Kato et al. propose a social capitalization index (SCI) of blocks for evaluating the quality of urban space. During Nagoya’s growth period suburban development was implemented mainly to accommodate the increased population. However, existing built-up areas remained sparsely populated, disordered, and lacking in infrastructure causing disharmony amongst buildings making for an overall 'shabby' urban landscape. These blocks should be made more attractive before population decline sets in. Social capitalization indices are useful in evaluating the quality of urban space and the suitability of blocks to be, and remain as, social capital stocks. The components of these indices are as follows: 1. convertibility of use of the building; 2. harmonized building form; 3. harmonized façade; 4. comfortable layout; 5. resource and energy saving; and 6. low environmental load. By applying and evaluating mixed land-use blocks in Nagoya and Paris, it was concluded that inefficient land-use and building disharmony reduce the quality of blocks. Improved quality can be achieved by effective urban planning regulations and a tax system which gives incentives to land and building owners.

Le Clercq and Bertolini evaluate policy measures in the Amsterdam area using the notion of ‘sustainable accessibility’. Concepts of sustainability in transport have changed from creating environmentally sound systems to creating systems that are also good for the economy and social equity. The principle of sustainable accessibility includes: (a) concentrated urban development/activity development; (b) spacing activity locations so as to decrease average travel distance; and (c) the stimulation, where possible, of environmentally friendly transport modes. These principles are applied to evaluate some important policies in Amsterdam: the compact city; the promotion of public transport; and a combined development location and parking policy (the A,B,C location policy). As a result, although no policy has, or could have been applied, Amsterdam’s urban development can be regarded as being relatively sustainable. The main conclusion is that maintaining sustainability design principles over time seems to be more important than trying to pursue a particular policy.

Hunt considers a variety of transport policy and investment alternatives for the Edmonton Region in order to develop a better understanding of the potential transport policy response to the Kyoto Protocol by using Edmonton Transport Analysis (ETA) Model. The model is a comprehensive aggregate transport demand model, which has approximately 500 zones and 9,000 links. Household travel is considered in 25 separate segments based on person categories (grade K-9 children, grade 10-12 children, post-secondary students, working age adults and senior citizens) and movement type (home to compulsory, home to discretionary, non-home-based, etc). The policies analysed here include improved transit services, travel restrictions and various fuel and parking pricing strategies. As a result it is concluded that fairly dramatic measures are required to bring about the reductions as envisioned within the Kyoto Protocol, with corresponding very large reductions in travel-related consumer surplus that impact segments differently depending on the specific policy elements included. As such, these results allow for consideration of both costs and benefits that would arise from such policy actions, including the equity effects associated with the differential costs borne by different segments of the population.

Cervero examines issues of transport and land use in California and evaluates smart growth as a tool for combating urban sprawl. California is one of the many fast-growing parts of the United States; it is
forecast to double its current population by 2040. In California, transport problems are to a major degree due to the suburban sprawl. Ultra-long commutes, traffic congestion and pollution are intimately tied to a shortage of affordable housing, fiscalization of land use, and real-estate market distortions. To deal with these problems, ‘smart growth’ is implemented successfully. A central tenet of smart growth is that transportation and land use must be intimately coordinated. Smart growth consists of the following strategies and policies: 1. land strategy, including compact cities, transit-oriented development, and traditional neighbourhood designs; 2. regulatory strategies, including growth management and linkage programmes etc.; 3. incentivizing smart growth, including targeted infrastructure and sliding-scale impact fees and market-based strategies etc.; 4. institutional reforms; and 5. sub-state planning. In conclusion, Cervero adds that as Japanese cities have experienced similar problems, policy-makers in California should learn from Japan.