quality**public**transport

Sustainability and urban public transport

Introduction

'Sustainability' is a term that gets thrown around a lot but its meaning isn't always clear. In the context of urban public transport, where multiple objectives (citizen access and mobility, reduction of greenhouse gas emission, social justice, urban planning, etc.) overlap and often contradict, sustainability very quickly becomes a complex and multifaceted term. Its usage in the public debate can be used to justify seemingly opposing policies. This is because any particular policy or measure can involve not only trade-offs between sustainability and other benefits but also between different aspects of sustainability.

This discussion paper has three aims:

● To outline the different meanings and dimensions of 'sustainability' and highlight the tensions between them;

● To explain how concerns over sustainability affect the transport sector, and the urban public transport sector more specifically; and

● To consider what sustainability concerns mean for the nature and requirements of employment in the urban public sector.

What is sustainability?

The term 'sustainability' properly entered public discourse in 1987 with the United Nations (UN) report, *Our Common Future*, commonly called the Brundtland report after its lead author, Gro Brundtland. In it, a specially appointed UN committee define a sustainable process or development as one that *meets the needs of the current generation without compromising the needs of future generation*.

The Brundtland report focused on environmental sustainability, which indeed still is the most common interpretation of the term. 'Sustainability', however, can easily be widened to encompass cultural, economic, political and social dimensions. Indeed, since any measure to increase environmental sustainability can have cultural, economic, political and/or social effects, it could be argued that

environmental sustainability itself is dependent on sustainability in those other respects.

Partly for that reason, an alternative definition of sustainability could be: *Processes that promote the capabilities of the current generation without diminishing the ability of future generations to fulfil their capabilities.* Within such a definition we find issues of human rights, democracy, equity, diversity, social cohesion, quality of life, and so forth.

Designing urban public transport policies that fulfil all these dimensions of present and future generations is no easy task, and can involve management of conflicting needs and priorities. Let's have a look at the ways in which transport as a sector affects the sustainability of given society's development, and more specifically, how urban public transport might figure into that.

Sustainability in the transport sector

Transport as a sector is difficult to manage from a sustainability perspective because of its intermediary status in all other sectors. It is near impossible to find a sector that doesn't rely on transport in one form or another, meaning that the practices of all sectors will affect the sustainability of the transport sector itself.

Conversely, the transport sector has great potential for improving the sustainability of the economy or society as a whole. This is widely recognised, as seen in legislation concerning vehicle fuel efficiency and greenhouse gas emissions, large public investments in and subsidies for public transport, and public funding for research into alternative energy solutions.

The transport sector therefore clearly illustrates the necessary trade-offs between and even within the various dimensions of sustainability. One measure to reduce greenhouse gas emissions is to heavily tax private vehicle ownership and usage, but that has different impacts on personal mobility and access that are partly related to relative levels of wealth.

Similarly, access to services is a component of social sustainability that can be promoted by extending the road network, but road construction can destroy natural habitats and lead to increase car use, and more pollution, congestion and accidents.

A further complication is that changes in transport policy often result in behavioural changes in the opposite direction of what was intended! For example, the policy of reducing road congestion through road construction can induce more people to drive and thus increase congestion.

Even increased use of cleaner technologies can have this 'rebound effect'. For example, changing taxation differentials to encourage the use of relatively green fuels can lead to such increased use of that fuel that the emission saving is cancelled out or even exceeded.

In short, due to the sector's multifaceted and fragmented nature, transport sector policies affect several dimensions of sustainability simultaneously and frequently in opposing directions. Finding the right balance can be, and often is, a tricky and

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highly politicised issue as different effects are felt by different groups of people, i.e. different income groups, different transport mode users, etc.

Sustainability and public transport

Public transport contributes strongly to urban sustainability by reducing the adverse environmental impact per passenger compared to private vehicles without limiting and sometimes even increasing mobility and access. It is a way of compromising between the various conflicting objectives inherent in sustainable passenger transportation. This is especially the case when public transport policies seek to promote a modal shift away from private cars and public transport is well-integrated with non-motorised transport users.

Public transport can also offer important public space for interaction across social groups, which is important for social cohesion and, when integrated with non-motorised transport, may significantly increase a city's 'livability', or quality of life.

Goldman and Gorham (2006) distinguish between four 'clusters' or types of sustainable transport policy interventions that may serve as inspiration for urban transport authorities elsewhere. Common for their success are pragmatic criteria of inexpensiveness, quick implementation, political popularity and effectiveness in achieving their stated aim. All the clusters share a systemic approach to sustainable transportation and an incremental, adaptive process of change.

New Mobility

Broadly speaking, the policies in this category deploy creative new technologies and/or business models to provide viable alternatives to private vehicle usage. These include:

- real-time travel information for passengers, accessible from mobile devices;

- fare integration, such as electronic travel cards and pre-boarding fare collection for reduced travel time;

- institutionalised car- and bike-sharing initiatives;

- auto-free housing, where housing developments close to transit hubs are exempt from prevailing property parking space requirements;

- new service paradigms, where transit companies approach their services from an 'access' rather than 'mobility' point of view by partnering with other sectors such as cultural event management organisations, shopping centres etc.

Most large cities have implemented some of the above elements, with Paris being at the forefront of this type of policy intervention.

City Logistics

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This type of intervention is largely aimed at the fleet of half-empty trucks plying through cities as a result of the modern rise in e-commerce and just-in-time production. Despite not being aimed at passenger transportation, these policies have nonetheless been very successful in reducing the number of truck trips in many urban areas, and therefore reducing congestion and improving the environment for quality public transport.

Initiatives include 24 hour neighbourhood drop-off points, and subsidies to retailer and shipper cooperatives to co-ordinate goods deliveries and restrict the access of vehicles with certain emission load or age in specified environmental zones.

For example, the German city of Bremen saw a 70% reduction in the number of truck trips within the urban boundaries after introducing subsidies to shippers' and retailers' cooperatives and extended opening hours to retailers receiving deliveries by electric vehicles only.

Intelligent System Management

Another technology-heavy type of policy intervention, the policies in this cluster are aimed at increasing the environmental, social and economic efficiency of urbanites' transport practices. These include:

- Congestion charging;

- Comprehensive bus system management, i.e. the imposition of quality incentive contracts with operators specifying various quality aspects such as cleaning, driver training, real-time arrival display, in-travel passenger information, and so forth;

- Automated traffic enforcement, typically using automated cameras, electronic congestion charging monitoring and bus lane encroachment enforcement.

London is the most advanced city in this type of policy, with the majority of the above either pioneered or quickly implemented there. Furthermore, London's transport authority is required to make a 'sustainable business case' for each new investment, by including various aspects of social and environmental benefits in investment proposals.

Livability

interventions of this type emphasise the relationship between the transportation system and the wider society, centred around the notion that hyper-motorisation is detrimental to the social and economic vitality of the city as whole. As a result, private cars are often given lower priority than other modes of transportation and city-wide public transport networks are a pre-requisite for the success of these policies.

Examples of policies include:

- The establishment of pedestrian and non-motorised areas, either permanently or at certain times.

- Policies aimed at breaking driving routines, such as city-wide car-free days and a cap on the number of days in a month a car can be used in the urban area;

- Bus rapid transit system;

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- Shared road space, where cars, cyclists and pedestrians co-exist on equal terms.

While this type of policy is the most invasive into the individual's choice of transport mode, the perspective taken on transportation taken by policies in this category is arguably also the most sustainable, by emphasising daily behaviour and the aggregate effects thereof on a city's accessibility, social engagement and overall health. The livability cluster is most frequently found in Latin American cities, with Bogotà, Colombia, at the forefront.

Systemic approaches to transport and sustainability

As is evident from the above examples, policies aimed at implementing sustainability in the urban transport sector touch upon the very structure of a city -- urban planning. Therefore, trying to create a sustainable urban transport sector is likely to be futile without the active participation from the sectors involved in land use and property development and public service provision.

Broad participation from various private sectors and public administrative departments also mean that issues of political economy and conflicting interests are likely to become salient and that a certain degree of pragmatism is advisable; a city like Atlanta, with heavy dependence on private motorised transport and thus a strong car lobby, is ill-suited for car-free days of the like seen in Bogotà.

Assigning lower priority to private vehicles in an attempt to encourage a modal shift will only work if there is a public transport system in place that is capable of servicing the needs of additional passengers. London's Bus Priority Network is a case in point, where the introduction of the congestion pricing was complemented by 840km of semi-exclusive bus lanes and a number of new routes.

The important point here is to consider the systemic sustainability of a city, rather than that of its individual sector; changes in the transport subsystem will generate behavioural effects that affect the system as whole. These could be so-called butterfly effects, which, as in the case of 'induced travel' or 'rebound effects', may move the system in the opposite direction than was intended, but which may also push the city onto a more sustainable path if, for example, cycling becomes normalised and the status associated with private motorised transport is diminished.

Systemic approaches are highly pragmatic and, as can be seen from the examples given above, are adaptive processes of existing urban structures, rather than attempts at reinventing the transport culture. Working with local public transport conditions and challenges go a long way, towards ensuring its contribution to sustainability. Many questions such as the following show the importance to sustainability of a range of issues associated with the quality of public transport systems and services:

- Does the city encourage a strong cycling culture?

- Is the metro well integrated with feeder lines?

- Could the fare integration be more smooth?

- Are stations deemed safe and clean by their users?

Further reading

Goldman, Todd and Gorham, Roger, 2006. **Sustainable urban transport: Four innovative directions.** Technology in Society vol 28, pp. 261-273.

Litman, T., 2003. **Reinventing transport: exploring the paradigm shift needed to reconcile transportation and sustainability objectives.** Transportation Research Record 1670, 1999, pp 8-12.

Jobs in a sustainable transport sector

This article has emphasised the need for a systemic approach to sustainable transport, wherein public transport is but one of the components and of equal priority to non-motorised transport. What might this mean for public transport workers?

One immediate implication could be that as the objective becomes sustainable transport rather than increased public transport per se, public transport workers will have to adapt to being workers in a transport system, rather than in isolated bus, rail or ferry industries, thus implying a need for complete modal integration.

Given a passenger's needs and the state of the network, a bus driver may have to advise a passenger to take the train or hop on a shared bicycle. As tickets become electronic and automated, conductors and ticket offices may become redundant but there will have be new tasks to fill in passenger services, information provision and the like.

In some cases, it may be more sustainable if an entire mode becomes automated as is the case for Copenhagen's driverless metro trains and unmanned metro station. Here, drivers and traditional station-staff are no longer required, but the need for engineers and electrical technicians has gone up.

Hence, the main bulk of employment in public transport may no longer be in the traditional positions such as drivers, conductors, and ticket office staff but rather shift towards highly specialised staff and 'customer service'-type positions, helping passengers make a smooth trip as part of the overall objective of ensuring individual access in an socially and environmentally sustainable manner.

These factors in turn suggest that the sustainability advantages of integrated and mutually supportive transport services as part of urban transport systems must be factored into political choices about the way in which public transport is owned and governed.