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Agenda

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Too much or not enough? Transport and cities

Cities have both benefits (such as more productive workers) and costs (such as congestion and increased pollution) relative to smaller settlements. What is the role of a city's transport networks in ensuring that the potential benefits of the city are enhanced, while the costs are minimised? And how can planning and funding help with the development of efficient transport networks?

According to the United Nations, 54% of the world's population lives in urban areas.[1] Cities are known to bring certain benefits to those who live and work in them,[2] but they also impose costs on those people and on the environment. A certain proportion of the costs and benefits of a particular activity are not borne by the person responsible for it. For example, an individual driving to work will not bear the entire cost of the increased air pollution and congestion resulting from their decision to drive. The additional costs and benefits of these activities are known as 'externalities'.

The costs from urbanisation tend to increase as a city grows. If nothing is done to mitigate the situation, a larger population tends to result in more congestion on roads/trains, more pollution and higher land/property prices. However, the benefits of a greater population density may not increase at the same rate. For example, as a city becomes larger and more congested, the benefits from having firms and their suppliers located together may stop increasing if the time needed to transfer people and goods across the city becomes too long or unpredictable. These externalities mean that the way in which transport networks are planned, organised and financed is of considerable importance.

Improvements to urban transport networks are often justified on the basis that they can either reduce external costs (e.g. by transferring journeys from road to rail and thereby reducing pollution) or generate benefits (e.g. by increasing accessibility of jobs and thereby facilitating people's access to more productive employment).[3] Some of these benefits and external costs are outlined below. They can help to explain why cities may develop at differing rates, and the influence of transport networks.

How cities support economic activity (and increase costs)

Cities have long been associated with economic growth. Economic historians have studied the increase in urbanisation as economies grow, although the extent to which urbanisation causes economic growth, rather than the other way round, is still debated.[4]

The link between economic growth and urbanisation is clear in the emergence of cities in rapidly growing economies such as China. The primary driver is generally taken to be the higher wage rates and wider employment opportunities available to workers in cities. These arise because workers are typically more productive (and therefore paid more) in urban settings.[5]

Why, then, are cities associated with increased productivity and economic activity? Perhaps the most fundamental reason is agglomeration,[6] which describes the process by which productivity increases as ever more firms in a given industry locate to a particular city. It captures three main channels through which firms benefit by being located in areas where similar firms also exist:[7]

- having access to a greater pool of workers with the necessary industry-specific skills;
- increasing the likelihood that suppliers of inputs are also located in these areas, where increased proximity results in lower transport costs;
- access to potential 'information spillovers', where knowledge that is useful to the industry permeates through the area.

The agglomeration effect has been studied extensively, and there is empirical evidence that all three of these channels provide benefits for firms and workers in cities.[8]

Set against this increase in productivity, however, are the incremental costs incurred by both workers and firms. These include costs associated with congestion, pollution and the high prices of land and property.

Congestion arises when many users access the same piece of infrastructure, thus reducing its speed and reliability. Increased congestion therefore results in lower productivity as workers, and people more generally, spend more time in conditions which are likely to be less productive than would be the case without congestion. More economic activity and more transport in any given area also tend to push up land and house prices around business districts and to increase polluting emissions, and may therefore offset the benefits that first attracted workers and firms to the city.

Good-quality transport networks have a clear role in facilitating some of the benefits that arise from cities, while mitigating some of the costs. Cleaner and more efficient forms of transport are needed as cities expand, so that the benefits of expansion continue to outweigh the costs.

What is the role of transport in supporting economic activity in cities?

Transport is frequently needed at multiple stages of the 'value chain' leading to the provision of goods and services. For example, factories are unable to produce goods if inputs are not delivered to them, and workplaces are redundant if workers are unable to reach them.

Consequently, the quality of transport networks is crucial if firms are to exploit the benefits of agglomeration. After all, the lower transport costs that arise from being located in the same city as suppliers are minimal if the inefficiency of the transport network leads to deliveries being costly and unreliable. Furthermore, while a large city may appear to contain an ample pool of skilled labour, these workers must be able to commute between residential and industrial areas if their skills are to be used.

Similar arguments apply at later stages of the value chain: if travelling around a city is difficult, costly or unpleasant, people are less likely to reach the (physical) marketplaces where firms provide their goods and services—in effect reducing the size of the market that firms are able to serve.

So what constitutes good transport networks for a city? In reality, there is no 'one size fits all' answer: the requirements of a transport network will depend on the characteristics of the city it serves and the preferences of the people who will use it.

A balanced approach is likely to be required: efficient public transport may help to free up road space for lorries to carry the raw materials and finished goods used and produced by factories, with appropriate incentives or regulation to mitigate the adverse effects of a high level of lorry traffic on air quality and congestion. As businesses are unlikely to be attracted to a city where the transport networks are not well aligned with their needs, effective transport networks must be designed around both the current needs of a city, and those that would arise if the city develops as planned.

How can good urban transport networks be delivered?

This article has provided a short review of how cities generate greater economic activity and greater external costs than smaller settlements, as well as how cities' transport networks can affect these costs and benefits. However, the challenge facing transport planners is deciding how to operate, upgrade and fund those transport networks.

This challenge is further complicated by having to balance the requirement to provide sufficient capacity for people to use the networks with the available budget, political systems and environmental constraints.

Given the widespread externalities inherent in how cities function, there may be an important role for government in setting the strategic framework for transport networks to support the development of a city. One way of doing this could be with a strategic economic plan, supported by a strategic transport plan. Recognising the importance of this interaction, the UK government has sought to ensure that cities carefully consider transport issues as a prerequisite for accessing development funding.[9]

The strategic economic and transport plans could then be used as a way of prioritising various schemes. The result should be coherent transport networks that deliver the connectivity that cities need. This, in turn, could help to promote the economic activity which is fundamental to supporting and improving the standards of living of those who live and work in cities, while minimising the external costs incurred through the provision of the transport networks.

Once the future needs of the transport networks are identified, the question is how to deliver and fund both the day-to-day operations and the desired improvements to infrastructure.

There are many potential models of operation, from full state ownership and subsidy, to a fully private sector solution without taxpayer support. In reality, most transport networks fall somewhere between the two, with government setting the framework and the private sector having a greater or lesser degree of involvement in delivering it.

There are two main ways in which cities fund their transport networks, which are used in varying proportions: government funding, and fares. However, alternative sources of funding have also been developed. One example is Crossrail in London, where the beneficiaries of the transport investment have provided some of the funding (see the left-hand box overleaf). Another example is tax incremental financing (TIF; see the right-hand box overleaf). Innovative approaches such as these could, arguably, have the potential to increase the amount available to fund improvements in the transport networks and enable enhancements that would otherwise

not be considered. In both approaches, the expected beneficiaries of the improvements are partly responsible for funding them. More 'traditional' funding approaches—such as straightforward government funding—may be unable to do this to the same extent.

This article has outlined a potential role for government in planning a city's transport networks, and has considered some ways in which transport schemes could be funded. It suggests that, while there are many ways in which transport networks can be delivered within a city, government may be well placed to set a strategic framework in which the various transport networks can support the economic growth of a city while reducing the external costs of that economic activity. There are then additional questions about how those networks should be delivered and funded.

The funding of Crossrail

The Crossrail rail line runs from east to west across London. Feasibility studies into the possibility of additional capacity along this artery were published as early as 1974, but construction did not begin until 2009. The scheme's projected cost and levels of available funding were still being debated in 2010.

The scheme is notable for raising large amounts of private funding to support its construction: more than one-third of the scheme's £14.8bn cost is being funded through 'supplementary' business rates on businesses within London, as well as contributions negotiated from key beneficiaries such as the City of London Corporation and Heathrow Airport.

Source: National Audit Office (2014), 'Crossrail – Report by the Comptroller and Auditor General', 24 January.

Tax incremental financing

TIF is a way in which local government can raise finance to fund infrastructure improvements by borrowing against the projected increased tax revenue from the increased economic activity due to the infrastructure investment. One advantage is that, in cases where transport is seen as key to fostering development within a local area, the funding of such transport can be linked to the development that occurs as a result. This is different from standard government funding of infrastructure because the borrowing is typically done by local, rather than national, government. However, it may not come without risk—if the expected increase in tax revenues fails to materialise, the local government would still need to pay the debt back.

While widely used in the USA, TIF is relatively new to the UK, although there are four examples in Scotland:

- Falkirk: improving the M9 motorway and Grangemouth flood defences;
- Argyll and Bute: extending Oban North Pier, and implementing renewable energy projects;
- North Lanarkshire: developing the town centre;
- Glasgow: improving the city centre, including the roads and accessibility of stations.

Source: The Scottish Government (2014), '£1.5 billion infrastructure investment: thousands of jobs forecast from regeneration funding', 28 April, available at: http://news.scotland.gov.uk/News/-1-5-billion-infrastructure-investment-be0.aspx.

[1] United Nations (2014), 'World urbanization prospects – 2014 revision', p. 1.

[2] See, for example, Combes, P., Duranton, G., Gobillon, L., Puga, D. and Roux, S. (2012), 'The productivity advantages of large cities: distinguishing agglomeration from firm selection', IZA Discussion Paper No. 6502, April.

[3] For example, the business case for the extension of the Northern Line on the London Underground is based on encouraging economic growth through increased accessibility to a particular part of London. See Transport for London (2013), 'Transport and Works Act 1992 London Underground (Northern Line Extension) Order—TfL's Inquiry Documents Category D: Economic and Business Case (NLE/D1)'.

[4] See, for example, Fujita, M., Krugman, P. and Venables, A. (2001), *The spatial economy: cities, regions, and international trade*, MIT Press.

[5] See, for example, Harris, J.R. and Todaro, M.P. (1970), 'Migration, Unemployment and Development: A Two-Sector Analysis', *American Economic Review*, **60**:1, pp. 126–42.

[6] As economies evolve, there is likely to be a greater concentration of economic activities in cities—and what is cause and what is effect is subject to debate.

[7] These three channels are summarised in Krugman, P.R. (1991), 'Increasing Returns and Economic Geography', *Journal of Political Economy*, **99**:3, pp. 483–99.

[8] See, for example, Ellison, G., Glaeser, E.L. and Kerr, W. (2010), 'What Causes Industry Agglomeration? Evidence from Coagglomeration Patterns', *American Economic Review*, **100**:3, pp. 1195–213.

[9] See, for example, the Manchester City Deal, which has transport as a core enabler of economic growth. Greater Manchester Combined Authority (undated), 'Greater Manchester City Deal'.