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Evaluation of wider economic impacts of light rail investment on cities

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ABSTRACT

Transport plays a critical role in facilitating competitiveness in post-industrial economies. High quality transport services and infrastructure enhance internal and external connectivity. This research examines published and unpublished evidence of economic impacts of modern light rail (tram and light metro) systems in the United Kingdom and globally. Evidence is considered relating outcomes of investment in light rail systems to: unlocking previously hard to reach sites for development; triggering fresh growth through elimination of significant transport constraints; stimulation of inward investment; extension of labour market catchment areas; reorganisation or rationalisation of production, distribution and land use; and land and property value increase and capture. Urban light rail investment can help regenerate Central Business Districts and boost employment and property prices. Similar rail investments in different locations may not however have the same economic impacts — geography matters. Other conditions in addition to transport investment are required for positive externalities.

1. Introduction

Recent international research has reinforced the links between transport investment and improved economic performance (Banister, 2011; Banister and Thurstain-Goodwin, 2011; Eddington, 2006a,b; Hensher et al., 2012; Ibeas et al., 2012; Knowles, 2012; Lakshmanan, 2011). There is substantial evidence that transport plays a critical role in facilitating city region competitiveness, and that locations with poor quality transport are at a competitive disadvantage (Banister and Berechman, 2001; Shaw and Docherty, 2014).

Public officials have demonstrated support for transit investment by recounting the economic, social and environmental benefits it may bring (Adler, 1987; SACTRA, 1999; Taylor and Samples, 2002). Citing wider economic incentives, the importance of transport connections within and external to a city, is valued in terms of accessibility, frequency and reliability of service, as well as its ability to act as a catalyst for inward investment, improvements in labour market performance, and an overall enhancement of city centre quality of life (Eddington, 2006a,b; SACTRA, 1999). Improving the level and quality of internal and external connectivity is therefore considered to be critical for improving city performance (Docherty et al., 2009). This paper provides a critical insight on the wider economic impacts of light rail transit (LRT) on cities across the globe; an often positive economic rationale that public and private organisations have often used to justify investment in light rail.

Most cities with successful post-industrial economies, and populations above 300,000,[3] are able to deliver new light rail and/or heavy rail schemes as well as smaller investments designed to reduce road and rail bottlenecks. Such urban rail investment can also help to regenerate Central Business Districts (CBDs), boost employment, land and property prices, and improve the quality of the city environment (Babalik-Sutcliffe, 2002; Cervero and Duncan, 2002; Hass-Klau et al., 2004). While these may be considered gains from an economic perspective, they may have major social implications as Grengs (2004) has argued, however, analysis of the social impacts are beyond the scope of this paper.

Geography matters where light rail is concerned as similar rail investments in different locations may not have the same impacts. For example, the importance of wider contextual factors has been shown to enhance and/or limit the impacts of rail-based investment (Chen, 2014), including economic factors (e.g., high quality labour force, and buoyant local conditions); investment; and policy and institutional frameworks (Banister and Berechman, 2001; Docherty et al., 2009; Mackett and Babalik-Sutcliffe, 2003). Such factors therefore need to be taken into account when analysing light rail impacts on cities.

As an option for cities investing in transport infrastructure, modern light rail (tram and light metro) systems can be highly attractive. The specific benefits of light rail include:

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[3] Cities with smaller population sizes have also effectively introduced light rail systems, for example Grenoble and Angers in France, and Freiburg in Germany.

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- more lightly engineered, and able to operate on steeper gradients and tighter curves than heavy rail trains
- lower capital costs in rolling stock and infrastructure than new underground metros and suburban railways
- ability to carry up to three times more passengers than buses, operate at higher speeds and have a much longer operating life
- proven ability, more than buses, to secure significant modal switch from cars, and sometimes able to reduce road traffic volumes and congestion
- faster and more reliable services than buses to and through the heart of city centres (CfIT, 2005; Grengs, 2004; Hass-Klau et al., 2003; Knowles, 1992, 1996; Knowles and Abrantes, 2008; National Audit Office, 2004; PTEG, 2005).

However, light rail is more costly for cities than investment in bus systems and this has influenced the geography of light rail mainly (although not exclusively) focused on cities in more developed countries, and in terms of specific routes within cities (Grengs, 2004). In such places, light rail is often regarded as a more modern, and high quality mode of public transit than bus-based alternatives (Hensher and Mulley, 2015), while its visibility, particularly where tracks are elevated, as in parts of Vancouver, Copenhagen, Manchester and the London Docklands, and in contrast to many underground metro systems, has made light rail a visual icon that can help to stimulate inward investment, act as a catalyst for renewal and regeneration of urban form, and create a 'sense of place' (Knowles, 2000; Knowles and Ferbrache, 2014).

While acknowledging that there are direct user and non-user benefits of light rail (Knowles, 1992), the focus of this paper is on wider economic impacts of light rail, namely "the broader set of benefits and costs associated with investment in transport infrastructure that are not accounted for in the traditional set of benefits and costs captured by transport planning models and evaluation frameworks" (Hensher et al., 2012, p. 292). Wider economic impacts have been, and continue to be, particularly difficult to predict, identify and analyse in isolation, yet they are often included as part of ex-ante and ex-post studies at micro, meso and macro scales (Banister and Thurstain-Goodwin, 2011; DfT, 2005; Lakshmanan, 2011; SACTRA, 1999). In this paper, we present our evaluation of such studies to examine identifiable economic impacts and limitations of light rail on cities.

In the following section, we set out the research context and define the analytical framework before discussing results in the main part of this paper.

2. What are the wider economic impacts?

The evidence on which this paper draws, comes from a detailed review of research undertaken to investigate and evaluate the wider economic impacts of light rail on cities in the UK, mainland Europe, North America and elsewhere. A wide range of robust ex-post evidence and findings from many countries was analysed, including academic research, Impact Studies and consultancy reports produced for and by various transport organisations (Knowles and Ferbrache, 2014). Forecasts of light rail impacts were excluded. To assess the wider economic impacts of light rail on cities, six thematic headings are used in this paper. The first five are those identified by the UK's Standing Advisory Committee on Trunk Road Assessment (SACTRA) in 1999, to provide a balanced assessment of the effects of all types of transport investments and policies:

1. Unlocking previously hard to reach sites for development
2. Triggering fresh growth through elimination of significant transport constraints
3. Stimulation of inward investment
4. Extension of labour market catchment areas
5. Reorganisation or rationalisation of production, distribution and land use.

A further theme emerged through analysis:

6. Land value and property value increase and capture.

Three further themes from the original research report, Transit-oriented development; Cost benefit analysis of transport schemes; and City image and quality, will be examined in later papers.

The following Sections 3.1 to 3.6 provide a critical and empirically-led review of this evidence.

3. Evaluation of the wider economic impacts

3.1. Accessibility: unlocking previously hard to reach sites for development

As stated by SACTRA (1999 p. 35), "The complete absence of a well developed transport system acts as a serious constraint on growth". Transport infrastructure can bring about positive impacts by helping to unlock previously inaccessible or hard to reach sites for development, particularly derelict docklands, brownfield former industrial areas, and reclaimed land in more developed countries (Eddington, 2006a,b). This is largely a question of access and transport may help to generate accessibility in terms of alleviating trade barriers, providing access to derelict sites or vacant floorspace, or to new employment opportunities where labour and/or land have been under-utilised.

Key examples where light rail has helped to unlock previously hard to reach sites included two of the UK's former Dockland areas: the London Docklands, and Salford Quays, Greater Manchester. During the industrial era, such docklands were poorly connected on their landward side with main road and passenger railway networks. When ports moved downstream to deeper waters, these traditional dock sites became derelict and lacked good land transport connections essential to their redevelopment. For instance, the London Docklands, largely derelict from the mid-1960s, until the 1980s, was described to be "more inaccessible by public transport than any comparable area of London" (Church, 1990 p.300). Similarly, a forecast of development in Salford Quays (the area around the former Salford Docks at the head of the Manchester Ship Canal) claimed that "without a significant, reliable and marketable improvement in public transport…, it is highly unlikely either that the official development proposals will be completed or that the public sector investment in the proposed Lowry Centre could be justified and therefore committed" (Roger Tym and Partners Ltd, 1996 p. 6).

With the development of new light rail infrastructure, the Docklands Light Railway (DLR) (which opened in 1987), and Manchester Metrolink extensions to Salford Quays (1999/2000) and MediaCityUK (2010), these formerly inaccessible sites have been opened up for development as post-industrial mixed office, leisure, retail and residential uses. The DLR has been labelled the "backbone" to development in the Docklands (SDG, 2005 p. 51; Carter, 1991; Grant, 1990), while in Salford Quays, the Metrolink extension had a significant impact in fostering further development, details of which are given below.

Other key sites that have been unlocked by light rail include formerly isolated areas and newer sites on reclaimed land. In Greater London, Croydon's Tramlink was extended during Phase 3 to link New Addington to Croydon's town centre. The residential area of New Addington is surrounded by the Metropolitan Green Belt, which has been partly responsible for an impression of isolation of New Addington from the rest of Croydon Borough. Tramlink helped to provide better access between New Addington, Croydon and Wimbledon by reducing journey times substantially, some as much as 25 min over previous transport modes (Oscar Faber, 2002). As a result of Tramlink, residents of New Addington have been able to access better employment

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