

Contribution of transport to economic development

Economic development and transport project

Summary report



Ministry of **Transport**
TE MANATŪ WAKA

Ensuring our transport system
helps New Zealand thrive

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1 INTRODUCTION

This paper summarises a study, *Contribution of transport to economic development – International review with New Zealand perspectives*¹, published as part of the Ministry's Strategic Policy Programme.² That study and this summary have been prepared with the assistance of Ian Wallis Associates.

The original study provides detailed information about the literature that informs both papers.

2 KEY POINTS

- ▶ The principal role of transport is to provide or improve access to different locations for individuals and businesses. Transport thus facilitates a wider range of social and economic interactions than would otherwise be possible.
- ▶ Transport is an important sector of the economy in its own right. Transport infrastructure provision and transport operations together account for about 5% of New Zealand GDP.
- ▶ Inadequate transport investment can hold back economic development. In countries with development potential, transport investment facilitates economic growth.
- ▶ In developed countries, such as New Zealand, where there is already a well-connected transport infrastructure network of a high quality, further investment in that infrastructure will not on its own result in economic growth. Investment in these circumstances should focus on responding to demand and 'pinch points' which would otherwise constrain growth.
- ▶ The quality of transport links can affect the relative competitiveness of one area over another area, because of quality of life, lower costs to access resources and markets, and access to larger markets.
- ▶ The impact of improved transport links on regional economies is context-specific and must be assessed on a case-by-case basis. Not all transport investments will be equally effective in enhancing economic growth. Transport investment is a necessary, but on its own not sufficient requirement to generate significant economic growth at either a national or regional level.
- ▶ However, by improving safety or other aspects of the transport experience for freight carriers or visitors to a region, transport investments may generate longer-term benefits.
- ▶ At an urban/metropolitan level, there is strong evidence that transport links can have major effects on the location and pattern of development. Transport investments can have significant impact on urban form by enhancing or detracting from it, leading to an impact on the attractiveness of a city as place to live, work and visit.

¹ <http://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/edt-contribution-of-transport-lit-review.pdf>

² <http://www.transport.govt.nz/ourwork/keystrategiesandplans/strategic-policy-programme/economic-development/>

3 TRANSPORT FUNDAMENTALS

3.1 Summary

This chapter provides an overview of the role of transport within the economic system and briefly discusses:

- ▶ the economic role of transport
- ▶ impacts of transport investments
- ▶ supply of transport services
- ▶ influences on demand for transport
- ▶ transport markets.

3.2 Overview of the economic role of transport

The principal role of transport is to provide or improve access to different locations for businesses and individuals, for both freight and personal movements. For the business sector, this involves connections between businesses and their suppliers, between businesses and other businesses, and between businesses and their markets. For the household sector, transport provides people with access to workplaces, schools and shops. It connects them to social, recreational, community and medical facilities for personal and leisure activities.

Transport is an important sector of the economy in its own right: transport infrastructure provision and transport operations together account for about 5% of New Zealand GDP. The level of transport investment together with the amount of expenditure on transport operations can have wider effects on the economy (as is seen when transport fuel prices increase substantially, resulting in reduced household expenditures on other goods and services).

In New Zealand, the land transport system is largely self-funded, in the sense that most of the costs of road investment, operations and maintenance are either paid directly by users (e.g. through car operating costs) or are funded initially by governments and recovered from transport users (e.g. through fuel excise duties and road user charges). There are exceptions to this 'hypothecated' (self-funding) approach, the main one being the partial funding of local roads and local public transport services through regional or local rates.

The New Zealand transport system gives rise to some external costs or 'externalities'. These include road accident costs, global environmental impacts (greenhouse gas emissions) and local environmental and health impacts (e.g. noise and particulate pollution).

The direct effects of transport investment are to reduce transport time and costs by reducing travel times, decreasing the operating costs of transport and enhancing access to destinations within the network. Transport investment may also mitigate any economic disbenefits, for example, by reducing congestion or the risk of injury. These incremental benefits of transport investments may be measured through conventional cost-benefit analysis.

Other indirect consequences of transport investments should also be considered in the evaluation of transport projects. These include effects on productivity and the spatial pattern of economic development. In the long term, transport investments contribute to economic development by stimulating a variety of inter-connected economy-wide processes, which can yield spatial and regional effects that augment

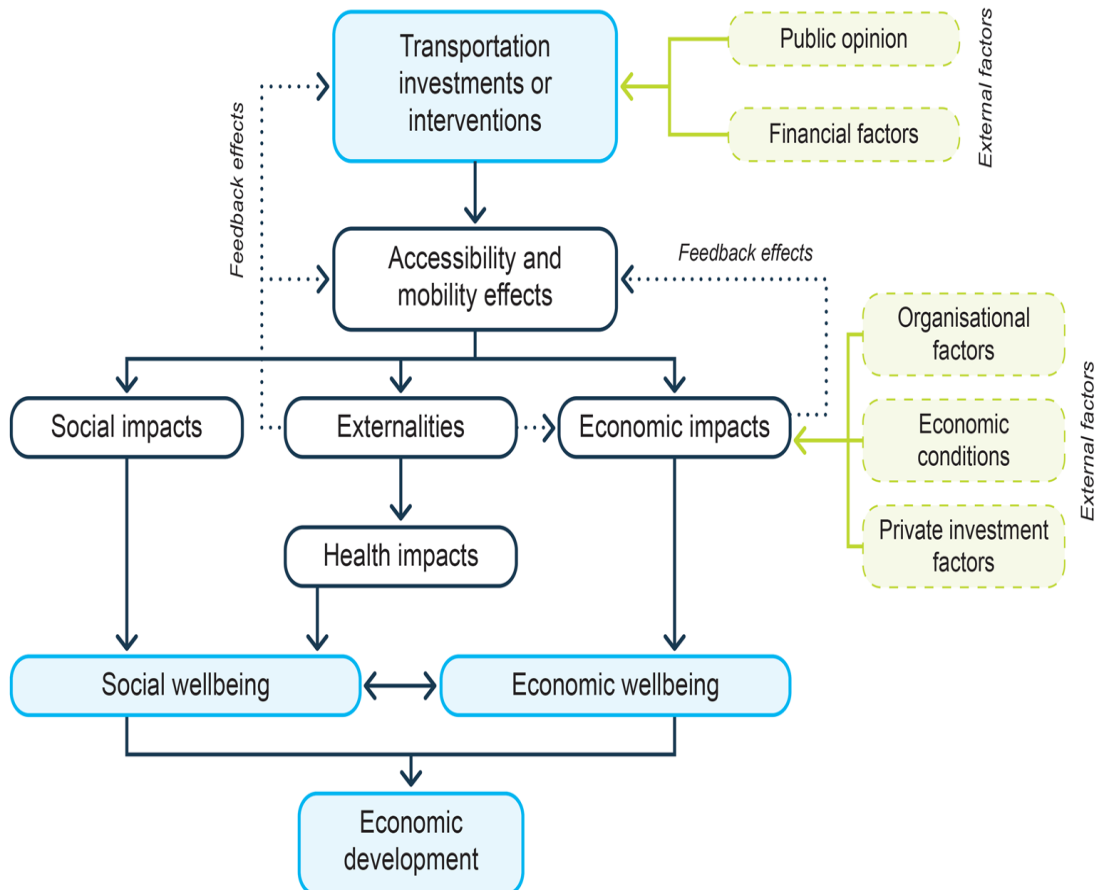
overall productivity (as discussed further in chapter 4).

In particular, lower costs and enhanced accessibility, due to better transport links and services, expand markets for individual transport-using businesses and improve their access to supplier inputs. Increased access and connectivity create increased opportunities for trade, competition and specialisation, which can lead to longer-term productivity gains. These changes are analogous to the gains from lowering barriers to trade and the expansion of opportunities that come from this. Therefore, knowing the circumstances in which these impacts occur is an important part of understanding the economic benefits that may arise from transport investments.

3.3 Impacts of transport investments

Figure 1 indicates the broad relationships between transport interventions, funding, well-being and economic development.

Figure 1: Transport and economic development – key connections



Source: adapted from Leung (2006)

Transport investments have multiple over-lapping economic impacts, which can be assessed from several perspectives. The initial impacts of investments 'ripple' through the economy both spatially and over time, manifesting themselves through changes in residential and industrial location, property prices, changes in the supply and demand for labour, and differential effects on the economy in any given area/region relative to other areas/regions.

As a contributor to economic development, transport infrastructure, by its very nature, has important impacts on intra-regional and inter-regional transport time and costs, and thus potentially on the location of households and businesses.

Transport services are produced and consumed jointly with transport infrastructure. Another distinguishing feature of the transport sector is that its function is primarily as an input to many other activities. Firms transport products to distribution centres and retail outlets; businesses send their employees to meet with customers, suppliers, regulators and co-workers; people travel to work and for leisure pursuits.

However, the demand for transport cannot be treated solely as a derived demand, i.e. solely responding to freight and passenger movements in the wider economy. Improved access is a necessary (but not sufficient) precondition for increased productivity, and improvements in transport systems may themselves promote growth, e.g. through reorganisation of production, distribution and land use by businesses, and reducing labour costs by expanding catchment areas for business recruitment of skilled and unskilled workers (refer chapter 4 for further discussion).

As discussed later, the link between transport and the economy depends crucially on whether firms are primarily consumers (users) of transport services, or whether firms use transport to change their production processes (or some combination of these roles).

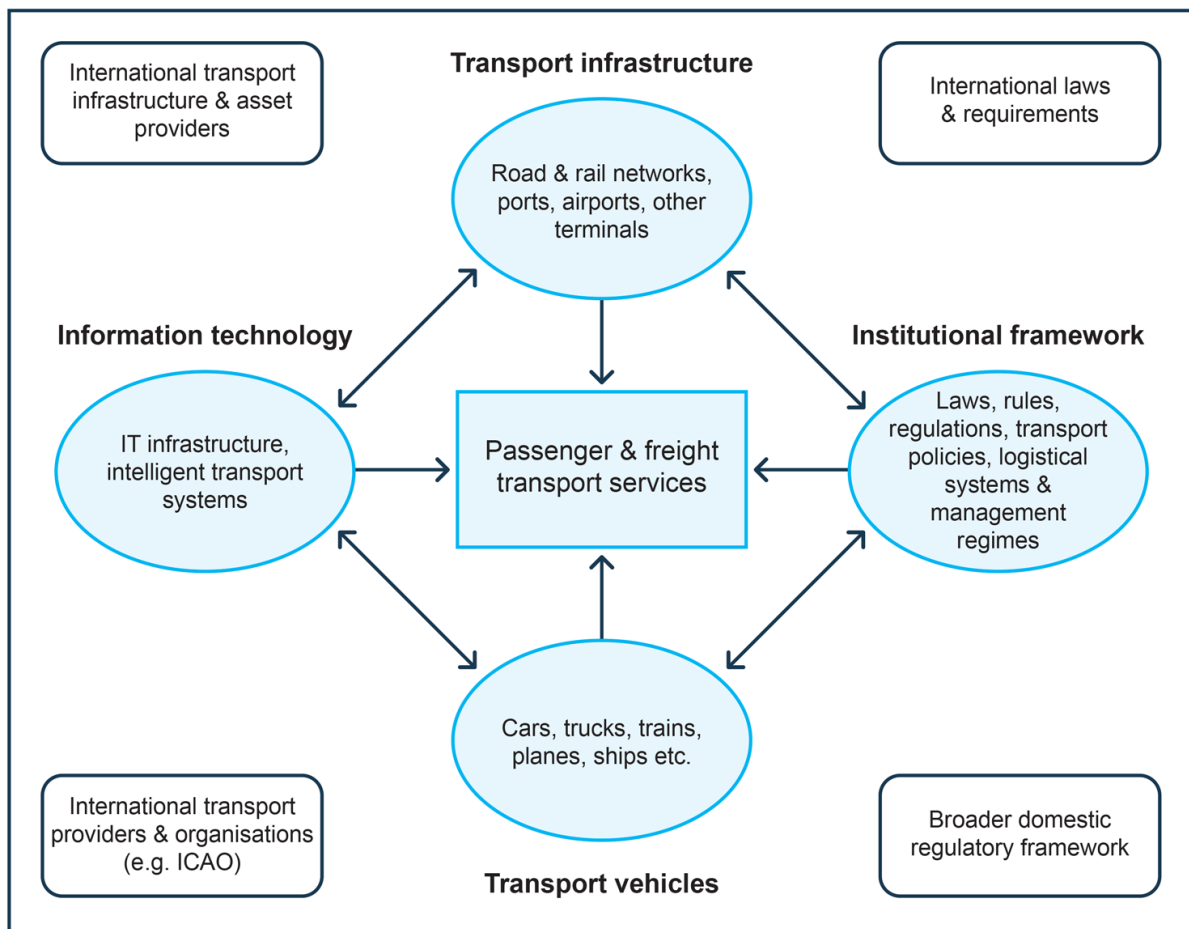
3.4 Supply of transport services

The production of all goods and services can be described using the concepts of inputs, outputs, and technology. Inputs have to be acquired by the firm and combined in order to produce and supply outputs. In the case of transport, the firm has to use vehicles, terminals, rights-of-way, energy, labour and so on, to produce movements of freight or passengers, from many different origins to many destinations in various periods and at various frequencies.

The supply of transport services occurs through a combination of providing and using infrastructure across a range of modes. Provision of infrastructure incurs capital costs and covers, for example, roads, railway lines, airports and ports, while usage is made possible through vehicles (e.g. cars, trucks, trains, aeroplanes and boats) and management systems (e.g. traffic lights, signals, air traffic control and navigational aids).

It is evident that the 'transport system' is broader than just physical transport networks and vehicles. It includes institutional settings and the 'soft' systems that underpin the coordination of transport services.

Figure 2: Stylised diagram of the transport system



Source: Adapted from Lakshmanan and Anderson (2002).

From the viewpoint of those using the transport system, a key aspect of supply is its price, i.e. the cost of using the transport system. The cost of transport to the user is conventionally discussed in terms of generalised cost. In transport economics, generalised cost is the sum of the monetary and non-monetary costs of a journey. Monetary costs might include fares, fuel and other vehicle operating costs, tolls etc. The main non-monetary cost is the value of time devoted to the journey, which will be influenced by the reliability, quality and comfort conditions of travel.

The generalised cost of a journey will clearly depend on, among other things, the amount of congestion on the network, and may therefore vary by time of day and location. As with other goods and services, the demand for transport will be inversely related to its costs as perceived by the users (not always the same as the full costs actually paid). For example, as the perceived costs of transport go up, demand generally goes down and vice versa.

For business users of transport, deterioration in the supply of transport, leading to a rise in its generalised cost, will tend to raise the price at which they can supply the market. Similarly, an improvement in transport supply, leading to a fall in costs, will tend to lower the price. To the extent that these transport costs are passed on, the impact of changes in the cost of transport is felt by the purchaser of the final goods and services.

Given that different areas have varying transport requirements for the distribution of products and/or the sourcing of inputs, the level of transport costs can influence the location of economic activity and businesses between towns, regions and even countries.

The supply side of the transport system can be altered in a number of ways:

- ▶ additions to, or improvements in, the quality or capacity of transport infrastructure
- ▶ replacement of existing infrastructure assets
- ▶ accelerated additions or replacements during economic recessions when there is underemployed labour and other resources
- ▶ better management of the asset base (clearing breakdowns faster, better management of traffic flows, new services making fuller use of existing infrastructure)
- ▶ changes in costs (e.g. in the case of roads, tolls, parking charges, fuel prices)
- ▶ changes in regulations relating to the delivery of transport services (e.g. changes in competition and regulations affecting entry to public transport and taxi market).

3.5 Influences on demand for transport

The extent to which the desire to travel translates into actual travel will be moderated by the time and costs involved in making the desired trip. Travel times and costs are dependent on:

- ▶ the supply of suitable transport services, including speed, quality and convenience factors relating to the services (e.g. service frequency, reliability, crowding)
- ▶ the financial cost (or price) of the services
- ▶ perceptions of any social and environmental costs associated with the trip and the services involved (e.g. level of safety and security, adverse environmental effects).

Demand for a particular transport mode, such as public transport (PT) or passenger vehicle, is dependent on a number of supply and demand factors. As an example, Table 1 lists the main ‘drivers’ of personal transport demand and modal shares in London (based on recent studies by Transport for London).

Table 1: Factors influencing person transport demand modal shares in London

Factor	Notes
Underlying demand factors	
Population	Including, in particular, distribution of population changes between inner and outer London.
Migration	Highly relevant factor influencing levels of car ownership and use.
Driver licence holding	Substantial decreases in licence holding among younger residents.
Income levels	Significantly different for inner v outer London.
Economic growth	Significantly different trends for inner v outer London.
Supply factors	
PT system capacity and frequency	Significantly different levels bus v tube
PT fares	Different trends single fare e.g. train vs bus
PT user satisfaction	
Parking availability and prices	Can be a major constraint on car use
Road use pricing	Central London scheme has had substantial effects on travel to/from Central London.
Fuel prices	Significant effect on PT v car modal choice.
Road system capacity	Reallocation of road capacity away from general traffic has had significant effects in many inner/middle areas.

Source: Adapted from Transport for London (2014). Drivers of demand for travel in London: A review of trends in travel demand and their causes. <http://content.tfl.gov.uk/drivers-of-demand-for-travel-in-london.pdf>.

Companies’ transport demand decisions are complex as multiple factors are involved, and both longer- and shorter-term choices need to be addressed. For example, a company wishing to manufacture and then sell its products in the marketplace needs to decide on:

- ▶ the sources of inputs for its products and how to transport these inputs to manufacturing sites
- ▶ the markets that it is best placed to serve, and how to transport finished products to these markets.

This will involve medium-term decisions about whether it provides its own transport (and if so how), or outsources its transport task; and shorter-term choices on the transport mode to be used, travel times and service quality features, etc as well as price.

Historically, the costs (including travel time) of transport have tended to fall as a proportion of the total costs of goods and services, as transport technologies and efficiencies have improved. This reduction in transport costs together with growth in household incomes has resulted in transport becoming relatively cheaper, for both businesses and households. This has been a major factor in increasing the demand for transport (per capita) over time.

In the household sector, much of this increased demand has been manifested through people making longer but faster trips, to take advantage of destinations and opportunities that would previously have been too difficult to access. The evidence indicates that the time that people spend travelling has varied very little in the modern era (averaging typically 60-70 minutes per day), but the distances travelled per person have increased very substantially.

In the business sector, the declining relative costs of transport have resulted in substantial increases in the transport task involved in manufacturing products and getting them to market, as business processes have been rearranged to minimise total production and distribution costs.

3.6 Transport markets

In economics, 'the market' is an abstract concept. It is the interface between the supply of, and the demand for, a particular good, which determines the prices and quantities that are bought and sold.

In New Zealand, with the exception of rail services, most freight and passenger services are provided by the private sector, although public subsidies are common for urban bus and rail passenger services.

Transport is characterised by a profusion of markets e.g. in terms of mode, localities, routes, service frequency and cost. For passengers and freight, there are varying degrees of substitutability between transport modes, often influenced by the distance between origin and destination. A large part of transport activity is transport for its 'own account', i.e. provided and operated by the person/business making the trip rather than by a specialist transport provider/operator. This is the case for car passenger transport, and also for a significant proportion of the road haulage market.

The operating environment in these markets has an important bearing on the conduct and performance of the transport sector, and in turn on outcomes such as affordability and safety.

Land transport infrastructure funding and investment (refer further discussion in chapter 7) is a major part of the government's involvement in transport and a major lever applied to transport policy objectives and broader economic objectives. Governments, both central and local, are major funders of transport and other infrastructure, so at the margin transport infrastructure is competing for political support with all other publicly-funded programmes and projects (including social infrastructure such as schools and hospitals).

4 ROLE OF TRANSPORT IN ECONOMIC DEVELOPMENT

4.1 Summary

In developing countries, transport plays an important role in economic development.

In developed countries where there is already a well-connected transport infrastructure network of a high quality, further investment in that infrastructure will not on its own result in economic growth. However, where the potential for economic growth is present and there are capacity constraints, a lack of transport investment can inhibit potential growth. Investment in these circumstances should focus on responding to demand and 'pinch points' which would otherwise constrain growth.

In developed countries, the economic gains from investment in transport infrastructure beyond the 'pinch points' described above, are likely to be modest. This chapter comprises discussions of:

- ▶ historic transport developments in New Zealand
- ▶ transport and economic performance in developed economies
- ▶ transport improvements and business efficiency.

4.2 Historic transport developments in New Zealand

Historically, transport was a primary factor of economic development. This was the case in New Zealand's early economic development; and it remains true in many developing countries, where the transition from a rudimentary, fragmented transport system to even a poorly-developed network is of great importance. The absence of a well-developed transport system acts as a serious constraint on growth.

Technological progress in transport, and the consequent capital investment, was essential to New Zealand's early economic development. The key new technologies involved were the steam engine (hence steamships and railways) and refrigerated shipping:

- ▶ Much of New Zealand, and its agricultural potential, was opened up through the development of railways in the 1870s (associated with the Premier Sir Julius Vogel and financed by overseas borrowing). Prior to that, only some coastal and riverside areas were readily accessible.
- ▶ Steamships lowered the cost and improved the reliability of links with the main overseas markets, improving the economics of agricultural exports and reducing the cost of manufactured imports.
- ▶ Refrigerated shipping allowed New Zealand to export more than wool, in particular meat and dairy products.
- ▶ In a more recent era, the Auckland Harbour Bridge opened up locations for economic activities and land uses that would not otherwise have occurred.

These new transport-related technologies and developments illustrated a very strong relationship between transport and economic development (including land use). Pioneering transport technologies (including railways, steamships, and refrigerated ships) offered improved access at lower cost and were consequently catalysts for economic growth.

In the transport sector, ongoing research and development internationally has produced major new inventions, such as diesel engines for trucks and trains, shipping containers, and airplanes. All of which have been greatly improved by subsequent innovations. New Zealand imported these innovations and

applied them with transformational effects on the economy, such as efficient road freight transport across a nation-wide network, and a national air network.

These reduced the generalised costs (the monetary and non-monetary costs) of transport and increased opportunities for travel and trade. New Zealand's own research-based transport innovations include remote-controlled rail shunting and the weight/axle weight/distance road user charging system (still a world leader).

One of the key issues for a small, geographically remote economy like New Zealand is the ability to access new knowledge being produced internationally. Thus, international connections are vital, highlighting the importance of the country's international airports and the national air travel network that feeds into them. More recently, access to new knowledge has been greatly enhanced through the 'explosion' of information accessible via the Internet.

The Eddington Transport Study (2006)³ includes detailed studies of the historical significance of transport developments for economic growth and productivity. Eddington states that, "there has been a compelling link between the transport system and economic prosperity throughout history" and comments:

"History is full of examples of how transport networks have played a critical role in driving phases of particularly rapid economic growth. Step changes in connectivity, often associated with new transport (and more recently communications) technologies, have often been of particular significance. [...] Inter-urban and international connections have permitted radical new production processes and allowed regions and countries to start trading in order to reap the benefits of increasing specialisation in the production of goods and services. The evidence is clear that, in the context of a developing economy, establishing basic connectivity is a very significant contributor to rapid economic growth."

4.3 Transport and economic performance in developed countries

Once a country's transport system is more established, the emphasis tends to switch from quantum leaps to more incremental improvements to the transport system and its operation - as made possible by ongoing technological advances, efficiency improvements and regulatory changes. Infrastructure expansion may also be required in response to increases in demand.

The links between transport and the economy also tend to become more complex, with transport investment having to meet multiple objectives: these may include improvements in safety, travel conditions, accessibility, environment, integration and social inclusion. Thus, an increased proportion of investment may be allocated for infrastructure and other schemes that address multiple objectives rather than solely to maximise contributions to economic development.⁴

Eddington states⁵:

"In countries with well-established transport networks, where connectivity between economic centres already exists, there is considerably less scope for transport improvements to deliver the periods of rapid growth seen historically."

The study goes on to outline the more recent focus of the transport debate in developed countries such as the UK on the performance of transport links in growing and congested urban areas. Transport

³ Eddington Transport Study (2006). Part 1.

⁴ This trend has occurred in New Zealand in recent years, as is described in chapter 9.

⁵ http://collections.europarchive.org/tna/20070129122531/http://www.hm-treasury.gov.uk/media/39E/D6/eddingtontreview_vol1.0_011206.pdf

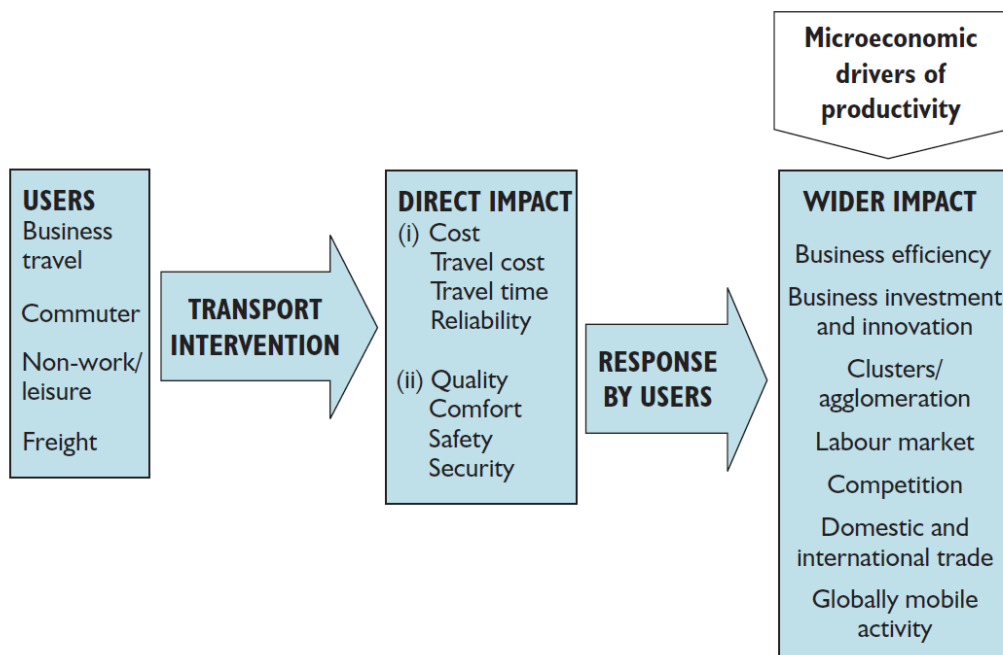
improvements are still important but in the developed country context, they are unlikely to be 'transformational'.

Eddington comments on the impact of transport improvements in a developed economy:

“The evidence is very clear that users want several things from the transport system, placing different weights on their relative importance. The key characteristics which are valued are: journey time, journey time reliability, cost, network coverage, comfort, safety and security.

When users experience an improvement or worsening of these characteristics, they feed through to impact on the economy through a variety of mechanisms – increasing business efficiency, investment and innovation, improving the functioning of agglomerations and labour markets, increasing competition, increasing trade and attracting globally mobile resources.”

Figure 3: Links between transport and economic performance



Source: Eddington Study (2006). http://collections.europarchive.org/tna/20070129122531/http://www.hm-treasury.gov.uk/media/39E/D6/eddingonreview_vol1.0_011206.pdf (Page 24)

Eddington describes the Wider Impacts above in more detail in the next section.

4.4 Transport and business efficiency

Transport improvements can present firms with a range of opportunities to reorganise their production and distribution channels to achieve cost savings that could not otherwise be achieved. Lower transport costs may also present other opportunities, such as the ability to choose the most appropriate suppliers to improve efficiency, offer more competitive prices and compete for sales in more distant markets.

Similarly, the International Transport Forum noted⁶ that the impact of lower transport costs on business efficiency is determined by:

(a) The proportion of transport costs in total costs of production

The proportion of transport costs in the overall cost structure of the firm is a determinant of the efficiency gains that could potentially be achieved through reductions in the firm's transport costs.

(b) How firms respond to transport cost changes

A firm's ability to respond to changes in transport costs is also important. For example, the firm's ability to reorganise its operation to adjust for reduced transport costs, whether it continues to operate in a single location or move to multiple locations to take advantage of transport cost reductions, or whether it can functionally specialise in different locations.

(c) Market structure

Firms may operate in a competitive market, monopoly market or imperfect market, etc. The more market power the firms have, the more mark-up they tend to gain. In such situations, it is possible for them to incorporate any transport cost saving in the mark-up to increase their profits. On the other hand, firms may pass on the cost reduction to gain a competitive advantage and increase market share. In a perfectly competitive situation there is no mark-up so cost reductions directly pass on to the final activity (purchaser).

The Eddington Transport Study (2006) describes how transport impacts on business efficiency and the wider economy through seven micro driver mechanisms⁷ (refer Figure 3 earlier):

- ▶ Increasing **business efficiency**, through time savings and improved reliability for business travellers, freight and logistics operations. A 5 per cent reduction in travel time for all business travel on the road network in Great Britain could generate around £2.5 billion of cost savings: 0.2 per cent of GDP.
- ▶ Increasing **business investment and innovation** by supporting economies of scale or new ways of working. The 2001 change in regulations that permitted 44 tonne trucks is estimated to have saved 134m truck km, £160 million of operating and fuel costs, and 135,700 tonnes of carbon dioxide.

⁶ Adapted from OECD, International Transport Forum (2008). ITF Round Tables The Wider Economic Benefits of Transport Macro-, Meso- and Micro- Transport Planning and Investment Tools.

⁷ Adapted from Eddington, R (2006). The case for action: Sir Rod Eddington's advice to the Government, page 15. <http://collections.europarchive.org/tna/20100408160254/http://www.dft.gov.uk/adobepdf/187604/206711/executivesummary.pdf>

- ▶ Supporting **clusters and agglomerations** of economic activity. Transport improvements can expand labour market catchments, improve job matching, and facilitate business to business interactions. Transport's contribution to such effects is most significant within large, high-productivity urban areas of the UK. London is the most significant example, adding 30 per cent to the time saving benefits of some transport schemes. Such productivity effects extend across commuter catchment areas, dropping away after forty minutes of travel time.
- ▶ Improving the **efficient functioning of labour markets**, increasing labour market flexibility and the accessibility of jobs. Transport can facilitate geographic and employment mobility in response to shifting economic activity e.g. in response to the forces of globalisation, new technological opportunities, and rising part-time and female participation in the labour market. Nationally, transport improvements are unlikely to have a large effect on the employment rate, though may do so in some local circumstances.
- ▶ Increasing **competition** by opening up access to new markets. Transport improvements can allow businesses to trade over a wider area, increasing competitive pressure and providing consumers with more choice. The UK is already well connected, so significant competition impacts are most likely to be felt from the integration of markets globally.
- ▶ Increasing **domestic and international trade** by reducing the costs of trading. Since 1960, falling transport costs have boosted the international trade of goods by 10-17.5 per cent, raising UK GDP by an estimated 2.5-4.4 per cent. Domestic trade links are particularly important to the economic success of some urban areas e.g. the relationship between the financial services sectors in Leeds and London.
- ▶ Attracting **globally mobile activity** to the UK by providing an attractive business environment and good quality of life. Such effects are of increasing importance but extremely difficult to quantify. However, the strategic focus of transport policy can be guided by the survey evidence which suggests that both domestic and international transport links can be important to attracting, retaining and expanding such activity, and that there is much commonality between the transport requirements of domestic and global firms.

5. TRANSPORT AND REGIONAL DEVELOPMENT EFFECTS

5.1 Summary

Transport investment is often seen as an effective policy available to governments to boost the economy of less economically-buoyant regions-- through improving transport links both within the 'target' region and to/from adjacent regions. However, such policies will not necessarily be successful, in particular because of the 'two-way road' problem: they may result in additional private investments and employment opportunities flowing into the region; but may equally result in population and employment opportunities flowing out of the 'target' region due to improved access to other centres. Any policy to apply transport investments to support regional development would warrant very careful appraisal.

This chapter comprises discussions of:

- ▶ spatial perspectives on transport investments
- ▶ transport investments and regional economic development
- ▶ inter-relationships between transport, land-use and economic development.

5.2 Spatial perspectives on transport investments

The empirical evidence on the effectiveness of transport investments on regional development is surprisingly sparse and of variable quality. The (generally optimistic) forecasts of many modelling studies have not materialised in practice; and most evidence indicates that the majority of any regional impacts are a transfer of activity from other regions, rather than a net increase in activity.

However, at an urban/metropolitan level, there is strong evidence that enhancements in accessibility to or in particular areas can have major effects on the location and pattern of development (e.g. the opening of the Auckland Harbour Bridge). In the longer term, accessibility changes can influence the form and density of the urban area, including the balance between the use of different transport modes (e.g. walking and cycling for shorter trips, public transport for longer trips).

Other issues need to be considered to provide a better understanding of linkages and interventions in a spatial dimension. These issues include how firms respond to transport changes; how labour and housing markets respond to transport changes; and the role of agglomeration effects (see section 5.4).

A UK SACTRA report⁸ (1999) identified the 'two way road problem' as a key issue in attempts to promote regional development (typically in relatively 'disadvantaged' regions) by means of transport investment within the region and between it and other regions. It concluded that:

"Improving transport links to a region identified as depressed or disadvantaged may result in investment and/or employment opportunities flowing into the region. However, equally, people, jobs (and perhaps investment) may flow out of the 'target' region due to improved access to other centres – through roads and other transport links."

⁸ Standing Advisory Committee on Trunk Road Assessment (SACTRA), 1999. Transport and the Economy full report to UK Department of the Environment, Transport and the Regions.

In assessing the likely regional impacts (in terms of under what conditions transport investment will benefit the ‘target’ region and under what conditions there would be an outward flow of investment and jobs would occur), SACTRA suggested the following key issues that would be relevant:

- ▶ scale economies (for example, where these dominate, lower transport costs through improved accessibility may encourage an increased concentration of firms in core regions, until the point that diseconomies sets in)
- ▶ size of the local market
- ▶ local land and labour conditions
- ▶ the nature of backward and forward linkages in the local economy
- ▶ the nature and scale of transport improvements.

It concluded that the impact of improved transport links on regional economies is context-specific and must be assessed on a case-by-case basis⁹:

“. . . there is no guarantee that transport improvements will benefit the local or regional economy at only one end of the route – roads operate in two directions and in some circumstance the benefits will accrue to other competing regions. . . assessment of whether economy impacts will actually benefit the intended target area will need to consider impacts outside the immediate neighbourhood. . . greater attention should be paid to the question of where the impacts will occur and on whom they will fall.”

5.3 Transport investment and regional development

This section summarises evidence from international case studies on the impacts of new road schemes or road improvements on economic development at the regional and metropolitan levels.

- ▶ New or improved roads that enhance accessibility of particular areas result in increased land values in these areas, whether the land is zoned for commercial, residential or other developments.
- ▶ The types of new developments which are particularly attracted to highly-accessible locations associated with new roads in peripheral urban areas (e.g. land adjacent to motorway junctions) tend to be:
 - ▶ distribution/warehousing activities, serving national and regional markets
 - ▶ hypermarket and superstore developments, that depend on large catchment areas
 - ▶ high-technology growth industries
 - ▶ offices requiring good access for employees and visitors, but not requiring central area locations.
- ▶ There is limited evidence on the importance of transport in location decisions by commercial or industrial businesses. Many other factors – such as access to labour, proximity to markets, and the costs and availability of suitable premises may affect such decisions.

Transport investment in under-developed areas with previous poor access does not necessarily increase the development of such areas relative to other areas. This is the ‘two way road’ issue – improved transport links may result in additional private investments and employment opportunities flowing into the region, but may equally result in population and employment opportunities flowing out of it.

⁹ SACTRA (1999). Transport and the Economy: Full report (page 12).

- ▶ Some theoretical (modelling) studies suggest that enhanced access may result in substantial increases in employment in areas with poor access previously. However such theoretical study results are often not substantiated by the empirical evidence—which tends to indicate much smaller impacts.
- ▶ It is generally considered that improvements in accessibility to areas where there is economic decline will not be a sufficient condition, and may not be a necessary condition, to stimulate economic recovery and growth in such areas. It is argued (Breheny 1995) that transport investment will only make a significant difference where it is the only missing feature of a strong economy. Improved transport is likely to be more effective in supporting economic development in the context of an area of economic growth if it removes a constraint to the movement of goods or people.
- ▶ There is very limited evidence, from either theoretical or empirical studies, on the net effects (as distinct from the gross effects in the area directly affected) on the development or employment effects of enhanced access. In general, it is likely that most of the gross effects represent transfers from other areas.
- ▶ Major new road schemes would generally 'induce' different patterns of land use development than would occur in the absence of the scheme. In particular, they may lead to rezoning of parcels of land in the vicinity of the scheme (e.g. motorway intersections), which will be attractive to particular types of commercial development (as noted above). Such differential land use impacts should properly be taken into account when assessing the traffic, economic and environmental impacts of major road schemes.

5.4 Inter-relationships between transport, land use and economic development

Beyond the initial effects of transport investment on journey times and costs, labour market, agglomeration and transport network effects also influence the long-term impacts of transport investment on economic growth and urban/regional development. Each of these wider economic impacts has a spatial dimension through their influence on the location and geography of economic and social activity. There are a number of different dimensions to these spatial impacts.

The first dimension is that the economic impacts may not be evenly spread. This means there is potential for transport investment to cause redistribution of economic impacts between (and within) regions. Analysts should be cautious when measuring benefits, such as new jobs created in one region, to ensure they are not miscounting redistribution as a benefit. The potential for redistribution is particularly relevant in the case of inter-regional transport links.

A second dimension is that, in an urban setting, local transport investment plays an important role in shaping the aesthetics and amenity of a community. Transport infrastructure and services can have a significant impact on urban form by enhancing or detracting from it, leading to an impact on the attractiveness of a city as place to live, work and visit. This will in turn affect the economic dynamism and culture associated with the city. The impacts of transport investment can thus have long-term impacts on economic growth and development, which go well beyond the initial benefits of travel time savings and lower vehicle operating costs.

Another dimension is that the economic impacts will play out via land use changes. For example, the construction of the Auckland Harbour Bridge had a major effect on the economic development of the Auckland region in general and the North Shore in particular. Such wider economic impacts are well beyond what would have been captured in an assessment of the long-term travel time savings, reduced costs, and improved safety attributable to the bridge.

Besides such influences on urban form, appropriate transport investment can improve the way cities function as "agglomerations". People and businesses gravitate to cities because of the benefits of being close to each other – close to potential jobs, potential employees, suppliers and customers. Transport can improve the performance of agglomerations by improving links between the different parties, for example with journey times that are shorter and more predictable.