

LINKAGES BETWEEN TRANSPORT INFRASTRUCTURE AND ECONOMIC GROWTH

Dr Carolyn O'Fallon
Director, Pinnacle Research

ABSTRACT

The purpose of this paper is to highlight what is understood (and what is not understood) about the relationship between transport infrastructure, and the services it provides, and economic growth in developed economies. In concluding that transport investment on its own will not guarantee economic growth, the paper examines such things as:

- The underlying conditions that, in conjunction with transport investment, could facilitate economic growth
- Impact on regional versus national economic growth
- The differential impacts on industry of transport infrastructure investment
- The potential for transport infrastructure investment as a transforming economic activity
- the possible role of political influences on infrastructure provision.

The implications of this relationship for transport infrastructure management in New Zealand are briefly examined. The paper provides a reasonably “high level” view of the subject, and does not attempt to fully explain the theoretical underpinnings of the debate.

This paper does not attempt to address the issue of “decoupling” economic growth and growth in transport consumption, as this has been the focus of a separate project elsewhere. Rather, the focus is on transport as an input factor in economic production.

Keywords: transport infrastructure, economic growth, investment

1. INTRODUCTION

The purpose of this paper is to briefly highlight what is understood (and what is not understood) about the linkage between transport infrastructure, and the services it provides, and economic growth in developed economies. The implications of this for the management of transport-related infrastructure services in New Zealand are also examined.¹ To do this, an overview of some of the available literature has been completed, with a particular focus on documents produced by the European Council of the Ministers of Transport (ECMT 2002), the UK's Standing Advisory Committee on Trunk Road Assessment (SACTRA 1999) and Banister and Berechman (2000). The work by these organisations / researchers is targeted as they have all taken, at

¹ An earlier paper by Pinnacle Research (2003) examined the linkages between infrastructure and economic growth. Infrastructure was defined to include telecommunications, energy, water services, and transport. That paper provides additional insights into modelling the relationship between infrastructure and economic productivity, efficiency of supply provision, and political influences on infrastructure and economic productivity.

various times, a comprehensive look at the linkage between transport and economic growth.

This paper does not attempt to explain in detail the different theoretical / empirical approaches (and their various shortcomings or strengths) used to analyse the link between transport infrastructure and economic growth. Other work, for example by Ahn and Hemmings (2000), De la Fuente (2000) and Button (1998), cover these details and issues quite thoroughly for infrastructure, including transport.

Because this paper is focused on transport infrastructure and services as an input into economic production, it does not endeavour to clarify the issue of “decoupling” growth in transport consumption and economic growth. “Decoupling” is the subject of an extensive New Zealand Institute of Economic Research project funded by the NZ Ministry of Transport.² Rather, the focus here is on transport as an input factor in economic production.

2. DEFINITION OF TRANSPORT INFRASTRUCTURE

It is perhaps helpful from the outset to clarify what is being considered as transport “infrastructure” in the context of this paper, as the definitions used in the available literature do vary. The definition adopted here focuses on the *services* provided by the physical transport networks or “infrastructure systems.” NZIER (2004) provided a comprehensive framework for assessing what “qualifies” as transport-related infrastructure, drawing the following conclusions:

- Roads, including bridges
- Rail tracks and modal interchange facilities
- Dock facilities
- Airport runways and terminals
- “Borderline” cases for inclusion as infrastructure: navigation and traffic control assets for air and maritime management.

3. THE RELATIONSHIP BETWEEN TRANSPORT INVESTMENT AND ECONOMIC GROWTH

In New Zealand and elsewhere, there has been extensive debate over the issue of whether or not the Government has been under-investing in transport infrastructure over the past decade, particularly given increasing levels of traffic and congestion on the road network. There are varying views as to how any possible lack of transport infrastructure investment could be affecting economic growth.

Often there appears to be two distinct perspectives on the issue: one suggesting that there is a definite relationship between economic growth and transport investment; and that under-investment impedes economic growth. Such studies often offer a measure of how much value transport investment will add to the economy. The other perspective suggests that the relationship is not so direct and that there may be no *net* impact of transport infrastructure

² An introductory paper on the topic (NZIER, 2003) was presented at a forum in Wellington New Zealand and is available from www.atrf.info.

investment on economic growth. Each of these perspectives is discussed below.

3.1. RESEARCH SUPPORTING A POSITIVE RELATIONSHIP BETWEEN TRANSPORT INVESTMENT AND ECONOMIC GROWTH IN DEVELOPED ECONOMIES

Two recent New Zealand-based studies provide an insight into the perspective that transport investment directly contributes to economic growth in developed economies. The first study, *Generating Growth: Infrastructure* (Infometrics, 2003), was prepared for the NZ Growth and Innovation Advisory Board (GIAB). It was based on interviews with 50 businesses and organisations, employing an average of 1725 employees per business (note that 96.8% of NZ businesses have 19 or fewer employees) and 73% of who had some export sales. The intent of the interviews was to identify infrastructure bottlenecks that could be negatively affecting economic productivity and indicating insufficient infrastructure capacity. Transport availability, cost and timeliness was the most commonly identified infrastructure bottleneck.

More recently, The Allen Consulting Group and Infometrics (2004) completed a report, *Benefits of investing in New Zealand's road infrastructure*, for the New Zealand Automobile Association and other business-related interest groups / organisations (such as the Employers and Manufacturers Association and Auckland Chamber of Commerce), as well as Greater Wellington Regional Council, Priority One (Tauranga), and Infrastructure Auckland. The study evaluated the adequacy of the current stock of New Zealand road infrastructure and investigated the economic contribution that transport infrastructure makes to the New Zealand economy. Using a computable general equilibrium model and cost benefit analysis, selected investments were investigated to determine the potential economic benefits that would flow to the economy if they were completed.

On a related topic, an earlier report, *Transport infrastructure: a perspective and prospective analysis of its role in Australia's economic growth* (National Institute of Economic and Industry Research, 2002), prepared for the Australian Council for Infrastructure Development Limited and the Association of Australian Ports and Marine Authorities attempted to prove the link between transport investment and economic growth in Australia using a Cobbs-Douglas production function. It took as "given" that transport infrastructure is a "driver of economic growth and competitiveness" (p. v). At the same time, it acknowledged that there was little consensus on "what is the precise link between transport infrastructure and economic growth" (p. v).

Each of these reports is discussed further below.

3.1.1. Infometrics (2003)

The transport issues identified by the 50 businesses and organisations interviewed had little to do with domestic transport infrastructure *per se*, but were focused on transport costs; the availability of air cargo and rail wagons; and the speed and timeliness of transport, as related to the frequency of air and rail services as well as congestion on the road network.

With respect to the matter of air cargo and rail transport availability, it should be understood that the level of service provided is not (currently) a reflection of a *physical infrastructure* constraint. These privately provided services have been reduced over recent years in NZ, probably because they have not been financially viable. If there was adequate demand (e.g. enough to generate a profit or sufficient subsidies to artificially create one), there is no infrastructure-based reason why operators could not provide more air and rail services.³

The executives interviewed by Infometrics stated that they could no longer rely on infrastructure or infrastructure services to meet their performance expectations, particularly transport and energy. At the same time, they acknowledged that infrastructure is only one of many factors affecting growth. By contrast to the Infometrics (2003) report, the *Small Business Monitor*, sponsored by New Zealand's National Bank, which canvasses small- and medium-businesses and enterprises on a quarterly basis, has not identified infrastructure or infrastructure services as creating business operating constraints.

3.1.2. The Allen Group and Infometrics (2004)

The Allen Group report found several indicators pointing to the inadequacy of New Zealand's current stock of road infrastructure, including:

- The decline in the value of the road capital stock as a proportion of the Gross Domestic Product (GDP)
- The lower level of annual spending on road infrastructure as a proportion of GDP than other OECD countries
- The increased utilisation of roads
- The higher fatality rates in New Zealand compared with other OECD countries
- The degree of "connectedness" of major urban road networks in New Zealand compared with other "comparable" countries, such as Canada and Australia.

The report also modeled four possible "land transport infrastructure packages" (a country wide passing lanes package comprised of 402 projects; the Auckland western ring route package; the Tauranga strategic roading network package; and the Wellington (as yet unspecified) regional land transport package) to identify the potential economic gains that may accrue to New Zealand from further investment in road infrastructure. The direct and indirect impacts were evaluated using computable general equilibrium (CGE) modeling *combined with* cost-benefit analysis. They found that, if all four projects were completed, there would be a total benefit, net of costs, to the New Zealand economy of greater than \$1.5 billion dollars annually in 2012, comprised of a net increase in GDP of \$1.0 billion (a 0.6% increase); a benefit of \$64.9 million attributable to the value of lives saved and permanent disability avoided; and a benefit of \$511 million from travel times saving for

³ However, there may be other more compelling reasons for not investing in further rail-based services. The ECMT Round Table (2002) specifically considered rail transport, suggesting that rail-based freight operations "have shown themselves to be incapable of supplying services of high enough quality" (p.188) to undertake the small scale shipments necessary to meet just-in-time requirements resulting from the combined trends of reduced stock inventories, the specialisation of firms and the globalisation of the economy.

non-work related activities. They also indicated that there would be substantial regional benefits – in each case (apart from the passing lane package), regional benefits were expected to exceed any “national” economic benefits, demonstrating that some displacement of economic activity between regions.

However, these results need to be treated with some caution. In the first instance, it is generally accepted that *either* CGE or cost benefit analysis may be used *separately* to estimate the benefits of investment. See, for example, Bureau of Transport Economics (1999) and Austroads (1997), both of which compare the relative merits of the two approaches in terms of assessing the benefits of transport infrastructure investment. The possibility of *combining* the two approaches is not even considered, and should be explained in The Allen Consulting Group and Infometrics report.

The reason the results are not combined is probably because such a combination creates a significant risk of double-counting benefits: for example, the \$511 million in travel time savings for non-work related activities from the cost benefit analysis is likely to be highly correlated or overlapping with the \$670 million increase in private consumption (which is part of the \$1.0 billion increase in GDP) found in the CGE, as the time and money people save in travel is used in other ways. Within the CGE modeling results presented there appears to be a risk of double counting: for example, the increase in private consumption is likely to be correlated to the increase in aggregate investment.

The report also does not address the issue of whether or not it is feasible to expect that any or all of the proposed projects could be completed in the suggested timeframe (i.e. by 2012) and what would happen to the benefits if construction occurred over a longer time frame.

3.1.3. National Institute of Economic and Industry Research (NIEIR, 2002)

Despite being aware of the inherent weaknesses of the production function approach, the NIEIR “proved” the link between transport infrastructure investment and economic growth using a Cobb-Douglas production function, reporting “the annual return on transport infrastructure investment (in terms of gain in regional/national GDP) could be as high as 100 per cent” (p. 25). The Cobbs-Douglas production function – along with the work by Aschauer (1989) who first used it to prove the relationship between economic growth and transport infrastructure – has been analysed and severely critiqued by various experts – including by SACTRA (1999), ECMT (2002), Banister and Berechman (2000) and NCHRP (1997). In particular, the Cobb-Douglas production function was identified as having the inherent statistical and analytical weaknesses of production function models using aggregate data. Furthermore, Banister and Berechman (2000) observed that Aschauer’s 1989 analysis did not *demonstrate* causality but *presupposes* it.⁴

The NIEIR (2002) observed that realising “expansion” or “spill over” effects on the national economy from regionally based transport infrastructure investment would depend on three factors:

⁴ Readers are advised to refer to these papers, as well as others listed in the introduction, if they are interested in further discussion of the theoretical underpinnings of the debate.

- The ability of transport infrastructure to encourage net international trade expansion (e.g. the availability of private sector or other investment capital and/or markets to receive expanded production)
- The [macroeconomic] environment that the economy is operating in
- The firms' response to productivity gains (e.g. invest in the economy, take profit off-shore, past cost-savings to consumers, etc).

NIEIR (2002) also noted that, to achieve the efficient operation of transport infrastructure, a link should be forged between information technology and management and transport infrastructure.

3.2. RESEARCH SUPPORTING A NEUTRAL RELATIONSHIP BETWEEN TRANSPORT INVESTMENT AND ECONOMIC GROWTH IN DEVELOPED ECONOMIES

The NIEIR and The Allen Consulting Group documents discussed in section **Error! Reference source not found.** found that investment in transport infrastructure has a significant, albeit marginal, effect on net economic growth even in developed economies. In contrast, the following reports review the same relationship and find that there is **not** a clear link between transport investment and net economic growth, although, if other conditions are also satisfied, transport investment may contribute to positive regional impacts.

The Secretary of State for Transport asked SACTRA to “consider the effects on the performance of the economy which might be caused by transport projects and policies, including new infrastructure, changing prices, demand management and measures to reduce traffic” (p.1). The final report, published in 1999, addressed the questions “do transport improvements lead to increased economic activity?” and “is it possible to ‘decouple’ growth in traffic levels from growth in the economy?” as well as examining the adequacy of UK transport appraisal practices.

The main purpose of the *Transport and Economic Development – Round Table 119* held in March 2001 by the European Conference of Ministers of Transport was to analyse the arguments for and against the presumed linkage between “transport infrastructure” and “economic development”. In practice, however, the Round Table considerations incorporated not only transport infrastructure but also the supply of transport services and other qualitative attributes.

Five reports were prepared by prominent transport economists to inform the discussion, which involved approximately 40 international experts in the transport area, including academics (such as David Banister, Yossi Berechman, Roger Vickermann, Phil Goodwin), cabinet ministers from various countries, advisors from national level transport departments and so on.

Berechman provided a paper to the *Round Table* summarising the key findings of a book by Banister and Berechman (2000), *Transport Investment and Economic Development*, which focused on answering the single question: “does transport infrastructure investment in well-developed

economies promote economic growth [especially at the urban level]?” Investigating the response to the question included:

- Establishing a conceptual framework to incorporate the many issues involved
- Examining how local and regional growth issues are affected by changes in behaviour, economic trends and lifestyle
- Reviewing existing analytical methods to understand the “underlying forces” contributing to economic growth and the “complex interrelationships at work”
- Undertaking empirical studies to complement the analytical research.

Their conclusions are presented with a view to their implications for policy-making.

A more detailed discussion of the findings of these three documents is presented below.

3.2.1. Standing Advisory Committee on Trunk Road Assessment (SACTRA, 1999)

After rejecting the 1989 findings of Aschauer, who used an analysis of production functions to “prove” a positive and significant relationship between transport infrastructure investment and economic growth, the SACTRA considered what mechanisms might deliver growth. “Transport improvements” were defined as any intervention, such as infrastructure provision or travel demand management or otherwise, that produced sustained reductions in transport costs or “equivalent improvement in service delivered.” Based on this definition, SACTRA identified 6 hypothetical mechanisms by which transport improvements could improve economic productivity:

- Stimulating “inward” investment
- “Unlocking” inaccessible regions / areas
- Inspiring growth which, in turn, motivates further growth
- Impacting on labour market catchment areas, and subsequently, labour costs
- Greater output as a result of decreased production costs
- Restructuring or rationalisation of production, land use and distribution.

They also identified four mechanisms affecting innovation and, potentially, economic growth:

- Increasing the rate of technology transfer by helping to attract foreign investment
- Encouraging clustering of firms “whose specialist knowledge has synergetic effects”
- Enhancing competition and improving integration of markets
- Increasing market size.

Following their analysis of these mechanisms, SACTRA concluded that the theoretical impacts identified above *can* exist “in reality” but that specific local conditions and circumstances strongly influence the effect of transport

improvements, such that no particular outcome can be guaranteed. While they thought the supposition was plausible, SACTRA found that there was insufficient evidence to support the claim that improved transport networks have a positive impact on labour productivity and, subsequently, on economic growth.⁵ De la Fuente (2000), based on the output of his cross-regional study comparing infrastructure provision in Spain and the US, likewise maintained that, as a “saturation point” is reached (e.g. as the basic network is largely completed), the returns on such investment declines. He observed that:

“Appropriate infrastructure investment provision is probably a key input for development policy, even if it does not hold the key to rapid productivity growth in advanced countries where transportation and communication needs are already adequately served.” (p.41)

SACTRA (and ECMT, 2002) determined that it is reasonable to treat transport improvements as being comparable to “reductions to trade barriers”, particularly when considering very large investments or where an area has been particularly inaccessible prior to the improvement. In such cases, transport improvements may result in micro-effects, e.g. improved efficiencies in specific firms where transport is a large cost component of the business; improved labour markets and increased ability for specialisation; and improved housing values, etc.

At the same time, SACTRA observed that, when transport improvements result in better linkages between two locations, at least some of the effects were likely to be redistribution benefits to a local area rather than an increase in national economic growth. SACTRA noted that the tendency will be for economic activity to concentrate in central “core” regions (until they become crowded) if there are potential efficiency gains in large scale production, while in a situation where the costs of inputs (such as labour or property rents) are lower, economic activity may be more dispersed.

McQuaid and Greig (2002) similarly advised that investment in infrastructure is more likely to promote centralisation and concentration than “dispersal” of economic activity – and may, as a result, benefit the areas least in need of economic expansion. They observed that careful analysis of the growth “claims” attributed to transport infrastructure investment is required to ensure that development is “additional” rather than “displacement” (re-located from elsewhere) or “deadweight” (would have happened anyway).

SACTRA (1999) found other factors influencing which area will benefit include:

- The comparative configuration of scale economies
- The nature and scale of forward and backward linkages in the local sectors

⁵ SACTRA noted that improvements in the generalised cost of commuting might be better reflected in housing prices than in the labour market, given that housing markets have a “fairly close” relationship with transport improvements. However, there is potential for double counting the benefits and SACTRA urged further investigation into the “complex” linkages between housing, transport and labour.

- Whether one region has a “unique” asset to capitalise on
- The size of local markets
- Local labour and land market conditions.

A 1997 NCHRP report analysing the linkages between transport investments and “economic performance” noted similar conditions as applying:

- The resources come from another country (and hence are imported into the national economy)
- Agglomeration economies are available
- Economies of scale are present
- The resources “represent entrepreneurial effort that would not have occurred without the infrastructure being in place” (p. 8).

3.2.2. European Conference of Ministers of Transport (Round Table 119 - held March 2001)

The ECMT Round Table drew the following conclusions with respect to the linkage between transport and economic development:

- Changes in transport supply or costs within a region may have either a negative or positive impact, depending on various other factors
- Transport improvements may increase the pool of available labour for employers (thus improving the ability of employees to gain jobs suitable to their qualifications and the ability of employers to gain suitably qualified employees, improving the productivity output per worker) – alternatively, they may:
 - Contribute to urban sprawl (where travel times are reduced / travel speeds increased)
 - Have little impact if there are other issues, such as the lack of skilled workers or where the spatial distribution of labour or other activities within the economy does not allow for uptake of the improvements
- The causal link between transport investment and regional development is weak, particularly once a certain threshold of investment is reached: “the greater the size of the region studied, the greater the extent to which the impact of investment in transport infrastructure is attenuated and redistributed between individual zones within that region...[Hence] major national programmes for investment in transport infrastructure do not really have a marked effect on production” (p.185).
- Transport is not a “highly discriminating factor” in explaining regional development – other factors appear more relevant
- The ability of the transport sector to reach its full potential is contingent upon the existence of complementary networks, particularly those involving ICT, which can help to generate productivity gains.

Overall, the Round Table observed that transport systems improvements could not be said to systematically improve productivity in a region, whether a region is defined as being neighbouring areas located within one country, the country itself or an area transcending national borders.

Individual reports to the Round Table contain the following insights:

- “Transportation is a necessary, but not a sufficient condition for economic development” (Blum and Dudley, p. 56). Without transport to overcome distances, it would not be possible to access / develop the capital stock in the national economy. Economic development requires both transport (and other infrastructure) investment and availability of private capital
- Decreases in the generalised costs of transport (e.g. through infrastructure changes, vehicle improvements, organisational changes within the transport sector, or modal shifts) may positively affect economic growth in one of two ways, by allowing:
 - Economies of scale (decline in unit costs permits the production of greater quantities of goods for the same price or the production of the same amount of goods with fewer inputs).
 - Specialisation of markets to occur, such that an area can produce more of the services or goods for which it has a comparative advantage (this, in turn, usually creates economies of scale)

Economies of scale are considered a “pure” productivity gain.

- Transportation investment in one area may cause a “reshuffling” of activities in an entire region, for example, by encouraging concentration of particular activities in one location, de-concentration occurs elsewhere, with no new “net economic growth”. This echoes the SACTRA (1999) conclusion; the OECD repeated this finding in 2002.
- While transport infrastructure investment may have a “modest positive” impact on economic growth, when opportunity costs are fully analysed, other types of public investment expenditure – particularly education and training to develop human capital – will have greater rates of return (Vickerman, p. 154)
- Economic growth does not necessarily require infrastructure investment, as improvements in the performance efficiency of transportation systems (e.g. through better management or pricing techniques) could have a similar effect.

3.2.3. Banister and Berechman (2000)

In completing this study, Banister and Berechman (2000) observed that they were not questioning the ability of transport infrastructure to produce transport benefits such as travel timesavings. What they were attempting to determine was whether or not these transport benefits translate into *economic development benefits* from these investments. Their basic conclusion is:

“In developed countries where there is already a well-connected transportation infrastructure network of a high quality, further investment in that infrastructure will not on its own result in economic growth. Transport infrastructure investment acts as a complement to other more important underlying conditions, which

must also be met if further economic development is to take place.” (p.318)

In other words, in a highly developed dynamic economy, transport infrastructure investment will support economic growth when the underlying conditions are present, but is not mandatory to achieve growth.

Three sets of “necessary conditions” to facilitate economic development are identified:

- *Economic conditions*: such as the presence of positive economic externalities (i.e. labour market, network or agglomeration economies), the availability of a good quality, skilled labour force, the presence of inefficiencies in spatial structures, and a generally buoyant local economy
- *Transport investment conditions*: the transport mode being invested in, availability of investment funds, network effects (e.g. is it a new link in an existing network, a new link connecting two “disjointed” networks or expansion of a link in an existing network?), scale of investment, timing, its location, and efficiency in implementation
- *Political and institutional conditions*: related to the broader policy environment (the “non-economic” factors) in which the investment takes place – e.g., level of investment (local, regional, national), presence of complementary policies, and the organisational and managerial framework that the investment takes place in.

Individually, these conditions may have very little or no impact on economic development. Banister and Berechman (2000) maintained that “it is only when all three necessary sets of conditions are present and operating together that economic growth will ensue”(p. 320). They posited that the most important condition is the policy-making environment in encouraging economic growth as a result of transport infrastructure investment.

Banister and Berechman (2000) observed that transportation infrastructure investments are *location related*. This means that their potential impacts occur at the level of the local economy. Thus, they concluded that the identification and measurement of any economic growth resulting from such investment must occur at the local level. As analysis becomes more “aggregate,” many of the effects will be lost.

Banister and Berechman (2000) also noted that the presence of good transport infrastructure *may* raise the image and perceptions of a region, thereby attracting additional private investment.

3.2.4. Impacts of transport infrastructure investment vary across different industry sectors

The preceding sections highlight the fact that the impact of transport infrastructure investment varies depending on location. It may also vary depending across industry sectors. Fernald (1997) analysed the link between public capital investment in roads and productivity and finds that investment in roads offers a “normal” or even zero rate of return at the margin. He provides evidence that increasing the roading stock induces greater than average productivity growth in “vehicle intensive” industries, while industries that are

non-intensive road transport users tend to be less than the average or, in a limited number of cases, even adversely affected.

This finding is complemented by two other US-based studies examining the effect of highway infrastructure investment on industrial sectors (NCHRP, 1997; Chandra and Thompson, 2000), which established that some sectors (particularly retail and trade) would increase while others are not affected. Both studies concluded that, when considered in aggregate, highway investment produced no *net* state or national economic growth.

In a related observation, the OECD (2002) found that, if the goal is regional “regeneration,” transport investment *alone* is unlikely to create positive employment impacts and result in social inclusion or accessibility benefits. Rather there is a need for coordinated programmes and policies to address other issues, such as training, housing and social services.

3.3. A SPECIAL CASE: TRANSPORT INFRASTRUCTURE INVESTMENT AS A TRANSFORMING ECONOMIC ACTIVITY

A special case of transport infrastructure investment facilitating economic growth can be made where a network is largely incomplete. For example, Fernald (1997) argued that the US inter-state highway construction programmes in the 1950s and 1960s resulted in a “one-off” boost in productivity – as opposed to a “continuing path to prosperity” (p.20) – as new links were forged between previously unconnected areas.⁶

Likewise, the OECD (2001) would probably consider the inter-state highway construction programme as a “transforming economic activity” of the period in the way that railways, electricity and, more recently, information and communication technology have been in their time. In the case of the US inter-state highway construction programme, this may have led to an “upward shift” in the growth path of the economies where the highways were built, before these economies reverted to a more “steady-state” output growth path. The overall slope of the path is expected to remain the same in the longer term, albeit at a higher level.

3.4. TRANSPORT INFRASTRUCTURE INVESTMENT AS A POLITICAL DECISION

In the last few years, economists have started to explore the nature of the policy decision-making process as an exogenous variable affecting public infrastructure and, consequently, production output. For example, Cadot et al (2002) and Stephan (1997) found that “pork barrelling” – especially lobbying by larger businesses and “swing-vote” political parties – has an effect on the decision to invest in infrastructure and on its distribution / location. It is assumed that large firms with sunk investments have a vested interest in maintaining or upgrading the quality of infrastructure in areas where they are located. By virtue of their size, they are more likely to take action to ensure that the improvements to infrastructure occur. The outcome of such influence could mean that there are “political distortions” in the spatial allocation of infrastructure investment, ultimately economically disadvantaging some regions or areas.

⁶ Note that “unconnected” is distinct from areas with few or “poor” (as in congested) connections, as may be the case in some parts of New Zealand.

Haughwout (2002), in an analysis of the effects of infrastructure investment in 33 large US cities, found that households derive more benefits from marginal infrastructure investment than firms. He suggested that public investment decisions may reflect political processes that may not be designed to maximise private sector returns – harkening back to the building of roads to get re-elected (which still occurs overseas, see for example Cadot et al, 2002).

In the 1980s and 1990s, New Zealand governments took steps to minimise the politically driven allocation of major infrastructure works. For example, in the area of electricity, splitting up the Electricity Corporation of NZ, privatising Contact Energy and establishing a wholesale market for electricity with private sector incumbents accomplished this. With respect to transport infrastructure, the establishment of a national benefit-cost framework and competitive tendering requirements was, in part, done to eliminate political influence in road construction. However, recent decisions to prioritise transport projects in terms of Government goals and directives may affect the impartiality of this tool for decision-making.

4. CONCLUSIONS

Transportation is a necessary requirement for economic growth in the early stages of a country's economic development. Hence, transport infrastructure investment and other transport-related improvements (particularly to do with improved information and travel demand management) can and do have impacts on economic productivity for particular people or industry sectors. However, in a developed economy, such productivity improvements may or may not lead to net economic growth, either at the regional or national level.

Take for example, an improvement to an already well-developed road network in a developed economy that improves traffic flow and generates travel timesavings. The immediate effect on commuters and transport intensive industries may be to reduce their transport costs on average, but this may not translate to net economic growth. It is dubious to assume a direct relationship between improved travel times and increased labour productivity, as this implies that workers will choose to spend their freed-up time working rather than engaged in a social or leisure activity.

The transport improvement *may* also increase the potential size of the labour market available – but at the same time, it may contribute to urban sprawl (because commuters can now live further away, usually at lower housing costs, and spend the same amount of time travelling as before) or result in the available labour choosing to work elsewhere because their choices are also increased. Non-transport-intensive industries are unlikely to experience any benefit. Thus, the overall impact on net economic growth may well be nil.

The fundamental conclusion of this brief reconnaissance of the literature is perhaps best summarised by Banister and Berechman (2000):

“In developed countries where there is already a well-connected transportation infrastructure network of a high quality, further investment in that infrastructure will not on its own result in economic growth. Transport infrastructure investment acts as a

complement to other more important underlying conditions, which must also be met if further economic development is to take place.” (p. 318)

This statement is regarded as true whether the national economy or a regional / local economy is being considered. One ECMT (2002) paper suggested that, when opportunity costs are fully analysed, other types of public investment expenditure, particularly to develop human capital, will have greater rates of return.

The reports reviewed offered various suggestions as to the nature of the “underlying” conditions that complement transport infrastructure investment and contribute to economic growth, including:

Economic conditions:

- The presence of positive economic externalities (e.g. labour market, network or agglomeration economies)
- The potential for economies of scale
- The potential for specialisation of markets to occur
- The availability of a good quality, skilled labour force
- The availability of resources that “represent entrepreneurial effort that would not have occurred without the infrastructure being in place” (NCHRP, 1997:8)
- The presence of inefficiencies in spatial structures
- A generally buoyant local economy.

Investment conditions:

- The transport mode being invested in
- The availability of investment funds
- Network effects (e.g. is it a new link in an existing network, a new link connecting two “disjointed” networks or expansion of a link in an existing network?)
- Scale, timing and location of investment
- Efficiency in implementation.

Political and institutional conditions related to the broader policy environment (the “non-economic” factors) in which the investment takes place:

- Sources and method of finance
- Presence of complementary or facilitative policies / actions (e.g. training programmes, structure of tax system, facilitating the entry of competitive and/or innovative firms, etc)
- The organisational and managerial framework of the infrastructure facilities
- The “political involvement of the political organs” (Banister and Berechman, 2000: 333).

Banister and Berechman (2000) argued that all 3 conditions (economic, investment, political and institutional) must be present for economic growth to occur, but that the most important condition is the policy environment.

Transportation infrastructure investments are “location-related”, that is their potential impacts occur primarily at the “local economy” level. Thus, the

identification and measurement of any economic growth should be undertaken at this level.

It is far from clear that any economic growth associated with transport investment will accrue to the actual area where the investment occurs. The improved transport connection may either attract development or labour to the region, or it may encourage it to relocate elsewhere due to reduced transport costs, better access to markets, economies of scale or agglomeration economies, etc. Thus, investing in transport infrastructure with a view to regenerating or assisting development in a specific region – unless coupled with other resources (such as private capital), desirable economic or policy conditions – may not achieve economic growth in that location.

Transport and information and communications technology (ICT) are suggested to be highly inter-related, such that investment in ICT rather than additional physical infrastructure may be more effective in both reducing congestion and improving economic efficiency. This relationship is worthy of further investigation.

4.1. IMPLICATIONS FOR NEW ZEALAND

One of the five objectives of the New Zealand Transport Strategy (NZTS, 2002) is “assisting economic development.” This is interpreted as having a “coherent and efficient transport system that contributes to our quality of life and supports economic development goals, both nationally and within regions” (p.10).

The NZTS (2002) recognised the important role transport infrastructure and its services play in NZ’s economic development. At the same time, however, there appears to be a belief that new transport infrastructure investment will “support regional development, especially in regions of acute need such as Tairāwhiti (East Cape) and Northland” (p.11). The findings of this paper suggest that:

1. Transport investment on its own cannot be relied on to contribute to regional development, but will be complementary to other economic, political and investment conditions necessary for that development – thus, regional development needs to be addressed in an integrated manner (as it is by the Ministry for Economic Development)
2. There is a significant risk that the benefits of improving transport infrastructure in a smaller, lesser developed region – unless it has unique resources – will not accrue to that region, but instead will be centralised to larger, more diverse regions. There is a 2-way flow of benefits. This risk should be recognised in regional development planning.

There has been a significant focus on the development and congestion of the transport network in Auckland Region by the Government and large business interests and, in December 2003, the government announced a significant package designed to “get Auckland moving”. Addressing congestion undoubtedly contributes to the sustainability of the transport network and the environment and will generate *economic benefits*. The significant investment and improvements in the transport infrastructure are also likely to improve *economic productivity* in the Auckland Region – particularly given the

potential for agglomeration and network economies, economies of scale and the well-developed links to the international transport network. However, it is probable, as indicated by The Allen Consulting Group (2004) report that much of this growth will occur as a result of the "displacement" of resources (labour and industry) from other regions to Auckland. Any *national* economic growth will be quite marginal and will happen over a long time period as the transport network is completed.

In general, the New Zealand economy and transport network (including maritime and airports) is already well developed, meaning that additions and improvements to the transport network will only contribute to economic growth at the margin, and then only when the economic, investment and institutional / policy conditions identified above have been met. This does not mean that the transport network improvements are not worth embarking on, but simply that expectations about the potential impact need to be tempered somewhat. Afterall, as Gramlich (1994) observed:

"If public investment really were as profitable as claimed [by some analysts], would not private investors be clamouring to have the public sector impose taxes or float bonds to build roads, highways, and sewers to generate these high net benefits?" (p.1187)

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