

**New Zealand's productivity paradox – a transport policy perspective**  
Ian Duncan and Joanne Leung, Ministry of Transport

July 2013





# **New Zealand's productivity paradox – a transport policy perspective**

Ian Duncan and Joanne Leung, Ministry of Transport

## **Abstract**

Transport policy advice in New Zealand involves an ongoing focus on the regulatory framework and government spending on land transport infrastructure – as well as its effects on economic outcomes and the extent to which these can be measured.

Transport interventions can facilitate economic growth and productivity. However, the link between transport and the economy is complex. It is not just about public investment in infrastructure or transport policy settings; neither is it just about transport industry performance. To understand how transport facilitates growth and productivity, we need to understand the transport system and its interaction with the broader economy.

This paper attempts to unpick the productivity paradox from a transport perspective by exploring the answers to three questions: What are the key elements of the transport system? What are the channels and mechanisms through which this system can influence growth? And what measures should we use to understand the influences of transport policy on economic performance?

### **Disclaimer**

The views expressed in this document are those of the authors and do not represent the views of the government or the Ministry of Transport.

### **Acknowledgement**

We thank Dr John Yeabsley (Senior Fellow) New Zealand Institute of Economic Research for his comments on an early draft, and other colleagues at the Ministry of Transport for their assistance and useful comments.



## 1. Introduction

The Ministry of Transport is the government's principal transport adviser. Our main role is to provide policy advice and support to the Minister of Transport. Through our advice we aim to improve the overall performance of the transport system; achieve better value for money for the government from its investment in transport infrastructure; and improve the performance of transport Crown entities.

In addressing the New Zealand's productivity paradox<sup>1</sup> from a transport policy perspective we consider our role, our objectives and the wider concepts of performance.

In Section 2, we discuss the importance of a systems perspective in analysis of transport and the economy. The transport system is an important enabler of economic growth, but transport cannot create growth of itself. It is the interplay between the economy and transport that matters.

We argue that the interplay between transport and the economy is complex, and not solely about public investment in infrastructure or transport policy settings. The sector dynamics are made up of many components; they result from infrastructure, the regulatory framework, institutions, market participants' behaviours and economic conditions.

In Section 3, we discuss the channels and mechanisms through which transport can influence the performance of the economy. We also distinguish the difference between welfare and economic growth effects.

In Section 4, we suggest that no single measure can tell the whole story about the

economic effects of transport (or transport policy) over all relevant time-frames. In connecting transport and transport policy, we consider allocative and dynamic efficiency perspectives to be central to assessments of the macroeconomic effects of transport policy. Therefore, we propose the need to adopt a more flexible and pluralistic evaluation approach to measure the performance of the transport system.

## 2. A systems perspective of transport

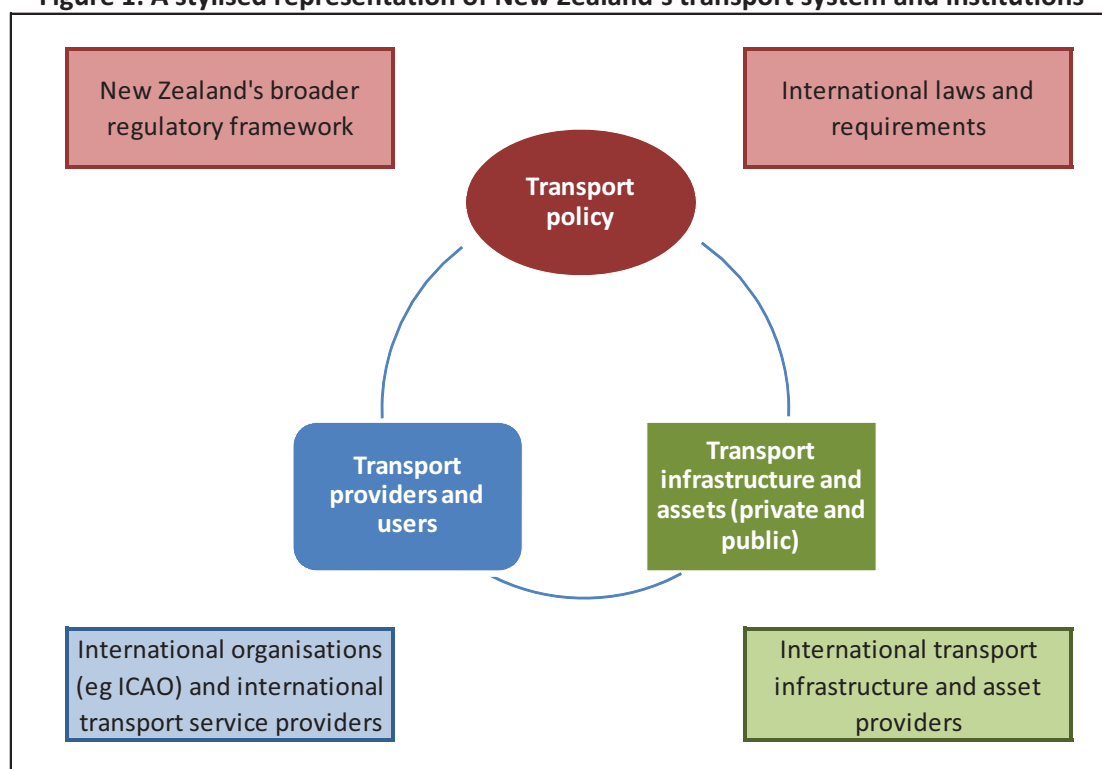
The linkages between transport policy, the transport system and macro-economic outcomes are complex. It is more meaningful to look at the relationships between transport and economic performance in a holistic fashion.

In this paper, we define the transport system as comprising the infrastructure, institutions, resources, means and equipment necessary for the movement of people and goods. There are three key components at the heart of the transport system – the enterprises and people involved in the system (i.e. transport providers and users); the infrastructure and assets that make up the system; and the transport rules and regulations that set infrastructure standards and govern how transport providers and users should behave (see Figure 1).

In addition to the three domestic components, there are also international laws and requirements, international transport infrastructure and assets, international transport service providers and users, and other non-transport related rules and regulations. Although these external influences do affect the performance of New Zealand's transport system, this paper focuses mostly on the three overlapping domestic elements. Those are the elements most directly influenced by New Zealand government policy.

---

<sup>1</sup> The proposition of the New Zealand's productivity paradox is "that productivity growth is low in New Zealand compared to other countries. This is a puzzle given New Zealand's generally good regulatory and institutional settings."

**Figure 1: A stylised representation of New Zealand's transport system and institutions**

Source: Ministry of Transport

Transport industries (providers) are just one part of the transport system. By way of background, New Zealand's 'transport, postal and warehousing' industries employ around 85,000 people, and in aggregate, account for about 5.2% of GDP. But such information tells us very little in an economic sense about the mechanisms through which improvements to the transport system influence or are affected by the broader economy. The major issues for transport policy are the impacts on transport users, whether businesses or households, and their responses over different time-frames.

### *Transport providers and users*

From a theoretical standpoint, analysis of the impact of infrastructure on economic development must consider the nature of the local economy, and the different actors that make decisions. There are three fundamental premises:

- (i) Investment must be effective investment (i.e. having tangible

effects on the performance of transport networks).

- (ii) The causal link between infrastructure investment and economic growth must be manifest in changes in transport-economic behaviour (i.e. by households, firms, and markets including prices).
- (iii) Transport improvements which influence travel behaviour and transport markets must eventually be transformed into measurable economic benefits.

These premises highlight the fact that apart from transport providers (e.g. the transport industry), firms or individuals using transport also play a role in the performance of the sector.

There are four key groups of transport providers and users, namely government (central and local), transport service providers, firms using transport services, and individual transport users. The roles of these actors are different, but their actions can affect the overall performance of the transport system.

Government may be perceived as having the highest level of influence on the performance of the transport system because it has the power to raise funds, design regulations and impose restrictions. In most cases, the ultimate reason for government intervention is to address various forms of market failures (such as externalities or monopoly power).

Most transport service providers (including transport, postal and warehousing and other related industries such as motor vehicle trading and vehicle testing) are subject to a high degree of competition and thus have fairly strong incentives to control their costs and at least match their peers in service quality. While transport regulations may have some influence on the market environment facing such firms, many other factors such as competition law, labour costs, technological advantages in vehicle design, and overall economic conditions will be critical.

While transport users such as firms and individuals may have limited influence at the individual level, collectively their actions may shape how the transport system operates. For example, firms' location and investment decisions (e.g. in physical capital or in research and development) can affect their potential to enhance business efficiency, compete and expand. These in turn may have influences on industry mix and aggregate productivity performance of the economy.

### ***Transport policy – roles and levers***

Government has several main policy levers that it can apply to the transport sector to address market failure, facilitate planning and

coordination, and to investment in strategic infrastructure on behalf of society. These policy levers can be grouped into two main categories – investment in transport networks and transport regulation. Each of these is a technology of governance purported for example to address the challenges of scale, risk and public good characteristics (in the case of roads), or to internalise externalities or other 'market failures' (the intent of most regulation).

At one end of the regulatory spectrum, the government can intervene through education and information provision (e.g. the Freight Information Gathering System and vehicle safety ratings information) to encourage the market to perform in the desired manner.

At another extreme, the government can regulate by prescribing the exact details about standards. Many vehicle safety standards regulations are close to this form of regulation. A key disadvantage of this type of intervention is that the regulation can be complex, inflexible and overly intrusive. Its poor ability to adapt to change means this type of regulation is usually subject to never ending revisions.

In between these two extremes, market control regulation (e.g. emission trading), incentive-based regulation (e.g. operator safety ratings) and performance-based regulation (e.g. vehicle emission standards) are part of the regulatory 'toolbox' in transport.

Transport rules and regulations do not apply only to the transport, postal and warehousing industry but also to other transport related service providers and transport users. There are also many other laws, regulations and rules (such as the Commerce Act 1986, Resource Management Act 1991 and Health and Safety in Employment Act 1992) which are not transport-specific but influence conduct and performance in the transport system.

In terms of infrastructure investment, the government provides high level directions through the Government Policy Statement (GPS) on Land Transport Funding, which is revised at three yearly intervals. At the operational level the sector uses strategic funding criteria (effectiveness, efficiency and strategic fit) to prioritise investments. There are also construction standards (e.g. in relation to strength, surface durability and adhesion, noise and environment protection) which govern the minimum standards to be achieved, and the Resource Management Act 1991 sets out how we should manage natural resources. This Act also governs such things as consents for quarries - and thus access to, and the cost of, road construction material.

### *Transport infrastructure and assets*

Transport services are jointly produced and consumed with transport infrastructure – part of the fixed capital of the system. New Zealand has 14 exporting ports and 6 international airports<sup>2</sup>. Our roading network expands to some 94,000 kilometres and the rail network is approximately 4,000 kilometres long. Together the country's transport assets are worth more than \$80 billion<sup>3</sup>. The majority of these assets are owned by central and local governments.

While a major part of transport assets is in the form of physical structures such as roadway and ports, private firms and individuals also invest in other transport assets in order to allow the physical movements of goods and people. For example, New Zealand has more than 3.2 million motor vehicles (including over 2.75 million light passenger cars and motorcycles, and around 500,000 heavy vehicles and buses), mostly owned by individuals and firms. While individuals and firms make their vehicle purchasing decisions

separately, their decisions can influence the efficiency of the system (e.g. vehicle breakdowns can cause delays to other motorists and fuel inefficient vehicles can increase transport costs and emissions).

Since road construction is a sub-set of the wider construction sector, the structure and operation of the construction sector, business and investment cycles and structural changes in the building industry (e.g. around earthquake strengthening, leaky building issues and the Canterbury rebuild) may have impacts on resource competition, firm behaviour and the overall performance of the sector. This in turn can affect the value for money from roading investment.

In transport infrastructure investment, allocative efficiency is about making the right choices between competing demands so as to maximise social and economic well-being. Cost-benefit analysis is generally used to assess the social, environmental and economic impacts from investment relative to the costs of the project. Travel time savings, vehicle operating cost savings and road crash cost savings typically account for the majority of the transport benefits from investment. More recently, new evaluation techniques for estimating the wider economic impacts (such as competition effect, agglomeration effects and labour market efficiency effects) from investment are also carried out for larger projects.

To prioritise investment activities, as noted earlier, the GPS provides high level directions and funding ranges around investment activities; and strategic funding criteria assist in choosing between and prioritising individual projects. However there is still a lack of a robust analytical framework for deciding on the right level and mix of transport infrastructure investment into the future. In other words, we struggle with questions about the appropriate level of investment over time.

In recent years, central and local government in New Zealand have jointly spent over \$3

<sup>2</sup> In Auckland, Wellington, Christchurch, Dunedin, Queenstown and Rotorua.

<sup>3</sup> From Overview of the Auditor-General's work in the transport sector, Office of the Auditor-General 2012 (cited in Performance Improvement Framework: Review of the Ministry of Transport, 2013).



billion annually on the construction, maintenance and operation of roads. This level of expenditure is expected to increase over time due to growth in demand. However, there are uncertainties around the level of revenue to be generated (through road user charges, fuel excise duty and registration fees) as it is affected by economic conditions and other factors. Therefore, achieving efficiency in transport infrastructure investment is crucial not only because it improves the productivity within the transport sector but also because it helps to minimise any negative allocative impacts to other part of the economy, and helps to achieve dynamic efficiency<sup>4</sup> in the longer term.

The key issues here are the 'network effects' sought and how the network effects of alternative projects can be identified *ex ante*. This involves consideration of location issues, physical configuration of existing roads, and economic perspectives. Also, the relationship between these contributions will vary widely from project to project, as will the time frames for these effects to play out.

**Key message:** *Transport rules and regulations, along with land transport infrastructure, are parts of the broader transport system. Transport interventions must be responsive to the needs of transport users, transport service providers and the wider community. All elements of the system and the interactions between them need to be incorporated in any assessment of the role of transport and transport policy in contributing to New Zealand's economic development.*

<sup>4</sup> Dynamic efficiency is achieved when optimal decisions are made on investment, innovation, and market entry and exit, to create productive and allocative efficiency in the longer term. Source: NZ Productivity Commission (2012), "International freight transport services inquiry" (p.34)

### 3. Transport policy and economic outcomes - channels and mechanisms

Transport policy is primarily focused on improving the operation of the transport system. Implicit in this is the assumption that improvements in the system (e.g. through infrastructure investment) will support the achievement of broader economic objectives.

In general, we would expect major transport infrastructure investments to improve economic welfare and contribute to economic growth. While there is a strong correlation between transport demand and economic growth, the direction of causality is less clear. Efforts to infer national economic growth effects from projects also raises other questions, such as whether there are significant net transformational effects at a national level, or whether such effects observed at a city or regional level actually reflect transfers (of benefits or economic activity) from other localities.

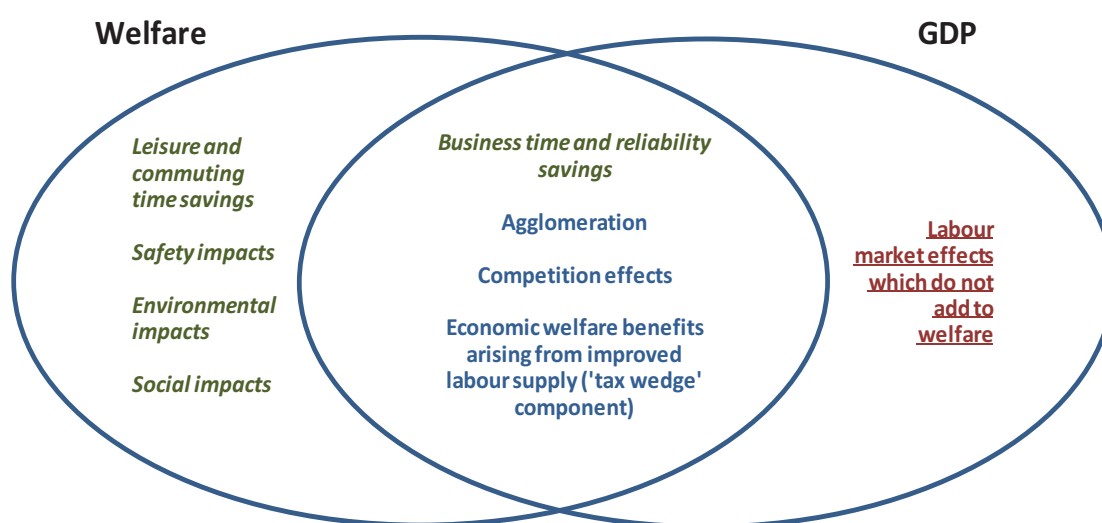
#### *Welfare and economic growth effects*

Part of the Ministry's role (in conjunction with the NZ Transport Agency) is monitoring the demands placed on the transport system. Each year, New Zealand drivers generate around 40 billion vehicle kilometres (around 90% by light vehicles), some 132 million public transport boarding are recorded, and around 9.6 million air passengers pass through New Zealand's international airports.

The domestic freight task is represented by over 18 billion tonne-kilometres by truck and 4.6 billion tonne-kilometres by rail. Our airports and seaports, meanwhile, handle around 52 million tonnes of overseas cargo.<sup>5</sup>

<sup>5</sup> Unless otherwise indicated, all transport volume data used in this paragraph is for 2011/12 (Source: the Ministry's [Transport Indicator Monitoring Framework](#)).

Figure 2: Welfare and economic growth effects from transport investment project



Source: Graham (2005)

But there are significant negative externalities associated with transport, albeit some of which are declining. In recent years around 300 people have been killed and over 2,000 people seriously injured<sup>6</sup> on the roads each year. Furthermore, around 255 people die prematurely every year - while many more suffer from long term respiratory related disease - due to exposure to emissions of PM<sub>10</sub> particulates from vehicles (Kuschel et al, 2012).

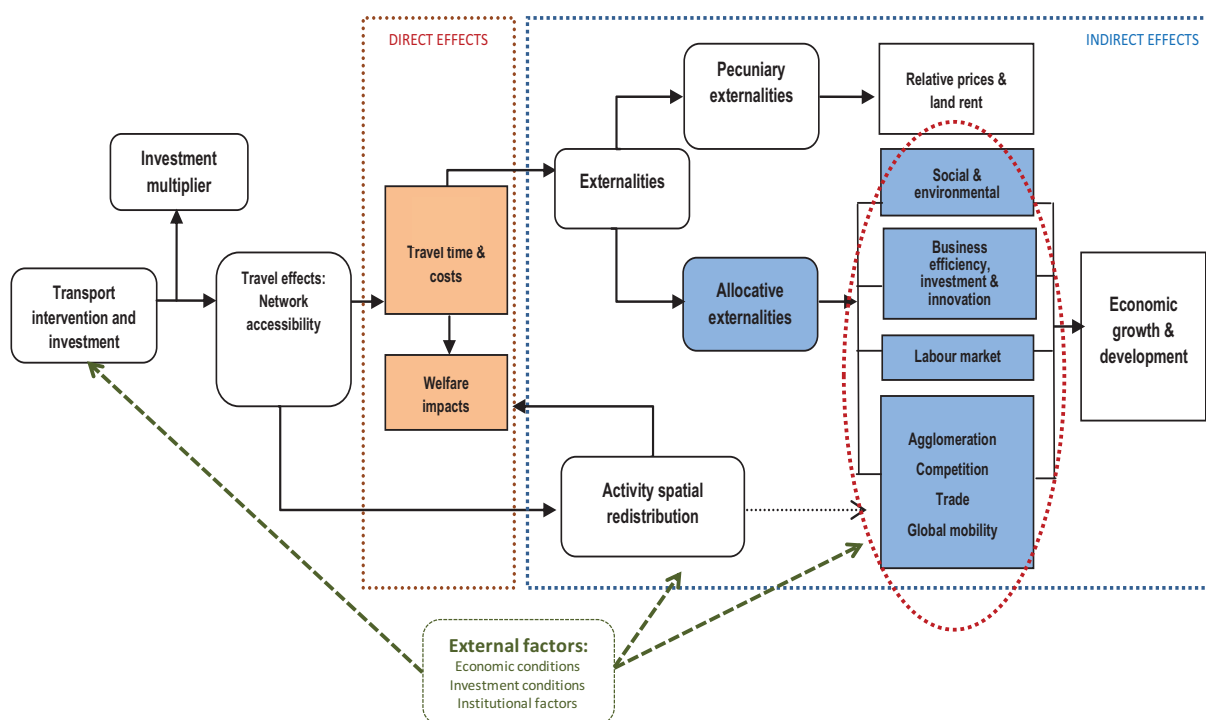
Therefore, analysis and discussion of transport interventions usually involved two perspectives as illustrated by the Venn diagram (Figure 2). Cost and benefit items that are typically included in transport project appraisal (items in green italics) are not identical to those included in an economic growth (typically in terms of per capita GDP) assessment, although certain GDP impacts (items in blue) are now estimated under the wider economic impacts evaluation framework (typically carried out only for larger projects).

The relative size of the welfare and GDP effects can vary with a range of factors such as project types and locations. Therefore, some projects that have high benefit-cost ratios do not automatically make an equally significant contribution to economic growth (and vice-versa). This is an important argument underlying our discussion, and much of the international literature it draws from.

Furthermore, because of the complex interactions between economic activity and transport, estimates of welfare and economic growth impacts typically subject to high degree of uncertainty. This means we need to adopt more qualitative approaches to address the question of the extent to which, or under what circumstances, transport investment that contributes to welfare also contributes to economic growth.

<sup>6</sup> This refers to police reported cases.

Figure 3: Transport institutions, investment, policies and productivity effects



Source: Based on Banister and Berechman (2001) and The Eddington Transport Study (2006)

As discussed later, there are several different channels through which transport system improvements may affect the economy. Much of the policy discourse is framed in terms of 'value for money' from transport spending – essentially this is about allocative efficiency.

Economic literature also emphasises the importance of dynamic efficiency to economic growth<sup>7</sup>. At the heart of adaptive (or dynamic) efficiency is the impact of product and process innovation by suppliers in the market place. Transport and transport infrastructure can be an important influence on dynamic efficiency in this sense.

### **The link between transport and economic development**

Transport can generate productivity impacts through improvements in the efficiency and reliability of travel movements, which in turn

<sup>7</sup> North, Douglass C. (1993) "Economic performance through time." The 1993 Economics Nobel Prize lecture.

enhance the opportunities for face-to-face interaction and market effects. The following discussions are largely based on Banister and Berechman (2001)<sup>8</sup> and The Eddington Transport Study (2006)<sup>9</sup>.

Figure 3 presents the channels from transport intervention and investment to economic development. Here we refer to economic development rather than just economic growth because it includes the dynamic progress and the creation of potential for economic growth in the longer term (Yeabsley and Guria, 2005)<sup>10</sup>. This is appropriate because transport affects our daily life and provides both economic and social opportunities for firms and people of the

<sup>8</sup> Banister, D and Berechman, Y (2001). "Transport investment and the promotion of economic growth", *Journal of Transport Geography*, 9, pp. 209-218.

<sup>9</sup> The Eddington Transport Study (2006), Main report, p.15.

<sup>10</sup> Yeabsley, J and Guria, J (2005). "Implementing the New Zealand Transport Strategy: An evaluation framework". Report to the Ministry of Transport, Wellington, 2005.

current generation, as well as for future generations.

There are direct and indirect economic effects of transport. Direct effects refer to those that occur at the time when individuals access goods, services and employment, and meet basic or social needs. These include effects from investment and from reduced generalised transport costs.

Indirect effects include secondary effects and longer term effects. These could include a reduction in prices, or an increase in product variety available to consumers. Over the longer term, a well-developed transport system allows firms to acquire, from both domestic and international markets, the most appropriate combinations of materials, skills and capital needed in the production process.

It also enables “just-in-time” procurement and distribution of goods (especially for seasonal and perishable commodities), and minimises storage and sunk costs. Improvement in the transport system also enhances competitiveness. This creates more incentive for firms to innovate, minimise costs and promote quality and efficiency, which in turn contributes to economic growth in the long term. Other indirect economic effects are externalities, such as congestion, environmental effects and the risk of involvement in traffic accidents.

Transport can support business efficiency through improvements in delivery time, costs and reliability. These improvements in turn can reduce the cost of production. One example is productivity gains from allowing High Productivity Motor Vehicles to carry longer and/or heavier loads<sup>11</sup>. The direct savings from transport improvements to

businesses can lead to a higher rate of business investment and innovation.

Another channel of influence might run directly from lower transport costs to productivity and production costs. Better transport provision allows firms to reap internal economies of scale in production, or obtain productivity gains from agglomeration effects. These agglomeration effects are some of the positive externalities incorporated in the study of the wider economic effects of transport, i.e. beyond those considered in conventional economic evaluation.

A reduction in transport costs can be seen as equivalent to lowering of barriers to trade because it can help to raise opportunities for trade and market integration at both the national or regional level. The greater exposure to imports (from other countries or other regions within the same country) is seen as intensifying competitive pressure on firms thus promoting greater efficiency, both through restructuring of industry and encouraging leaner production.

Transport interventions can also affect the labour market through impacts on labour participation, business location and mode choice decisions. Furthermore, transport improvement in connectivity and accessibility can make businesses, capital investment and labour become more globally mobile. This mobility can further enhance all the effects discussed above.

But causality is unlikely to be unidirectional. The ultimate economic effects of a transport initiative – such as a major infrastructure investment - may depend on various feedback loops, the strength of which will vary according to economic conditions. These channels are also affected by the transport externalities observed and the corresponding transport intervention responses.

Intuitively at least, an improved transport link seems likely to have more marked effects in a situation where the current network is closer

---

<sup>11</sup> The Land Transport Rule: Vehicle Dimensions and Mass 2010 Amendment rule allows vehicles that meet time restrictions and other operation requirements to carry longer and/or heavier loads on certain routes. These vehicles are referred as High Productivity Motor Vehicles (HPMVs).

to capacity, and travel demand is growing fast, than in other circumstances. As noted in the literature (e.g. Berechman, 2002<sup>12</sup>), transport is a necessary but not a sufficient condition for growth and productivity improvement. There is a possibility that linear thinking about productivity within a sector such as transport may omit unobserved but important contributing factors.

### **Necessary and sufficient conditions**

The long-term relationship between transport and the UK's productivity was investigated by Sir Rod Eddington in 2006. Eddington concluded that "there is clear evidence that a comprehensive and high-performing transport system is an important enabler of sustained economic prosperity" and that transport "can improve productivity when other conditions are right". Eddington summarised the external conditions that are necessary to complement any transport provision as follows:

- *economic conditions* - a stable macroeconomic policy climate, local market circumstances, agglomeration, and labour market conditions;
- *investment conditions* - availability of funds, timing and structure of investment, type of infrastructure investment, location of investment in terms of network structure; and
- *political and institutional conditions* - decision making, planning, sources and methods of finance, level of investment (local, regional or national), supporting legal and organisational/institutional policies and processes, and method and governance of infrastructure delivery and provision.

**Key message:** *The interplay between transport and the economy is complex and not solely about public investment in infrastructure or transport policy settings. Transport investment by itself is a necessary but not sufficient condition for economic development. Other factors that are essential for development include economic conditions, investment factors and political factors. These external factors affect transport investment and intervention decisions, and the scope for achieving economic growth. On the other hand, transport policy involves the application of various levers to the transport system aimed at a number of different policy targets.*

### **4. Measuring the performance of the transport system**

The sources of economic growth can be thought of in terms of an aggregate production function in which output per worker depends on stocks of physical, human, and natural capital. Physical capital, of most interest in this study, comprises tools, machines, buildings and infrastructure such as roads and ports. Economic growth thus depends on the rate of capital accumulation and the rate of productivity growth. It also depends on resource allocation, i.e. what goods and services are produced, the capital and other inputs used in their production, and the technology utilised. Most of the study of economics is about the allocation of scarce resources among competing ends (i.e. allocative efficiency).

<sup>12</sup> Berechman, J (2002), "Transport Investment & economic development - Is there a link?" in "Transport and Economic Development in OECD", Report of 119<sup>th</sup> Round Table on Transport Economics held in Paris March 2001, Report of Israel, pp.107-135.

Ultimately the purpose of measurement (e.g. assessing impacts of the transport system or particular changes in that system) is to gather data to inform future decisions. It is one way in which institutions can evolve and improve. However, we need more than apparent statistical relationships between policy 'inputs', 'outputs' and 'outcomes' – ideally we also need to be able to diagnose the reasons for success or failure.

Unfortunately, in the real world, we don't have controlled experiments or clear counterfactuals. And this is no more evident than in transport policy where we are dealing with:

- A multi-part system (as per Figure 1 earlier)
- Both economic growth and welfare objectives
- Various levels of spatial effects e.g. local, regional, national
- Micro, meso<sup>13</sup> and macro perspectives of the mechanisms by which (or pathways through which) transport 'improvements' influence economic outcomes
- Alternative transport modes
- Widely dispersed asset lives and temporal relationships between initial shocks and ultimate outcomes
- The wide variation between inputs and the value of outputs that can be observed in services such as transport.

Part of the challenge is to decide what performance measure is most relevant to understanding these economic relationships.

Productivity has links with, but is distinct from, concepts such as efficiency, effectiveness or performance. Effectiveness is often referred to as doing the right thing, efficiency is doing things right and productivity is doing things the right way. As noted in

Djellal and Gallouj (2008), performance is the broadest of these concepts and encompasses all three. When measuring performance, it is therefore often required to look at all these components simultaneously.

For example, in the Productivity Commission Inquiry into International Freight Services (2012), it states that

*"The wellbeing of New Zealand citizens is the relevant and appropriate high-level objective for inquiries into whether government policies can be improved. Attaining economic efficiency is one among a range of important ways to raise wellbeing. As explained below, it has played a key role in this inquiry."*

Achieving economic efficiency to raise wellbeing requires considerations of progress and development in the longer term. As noted earlier, it is this dynamic progress that is the key to long term growth.

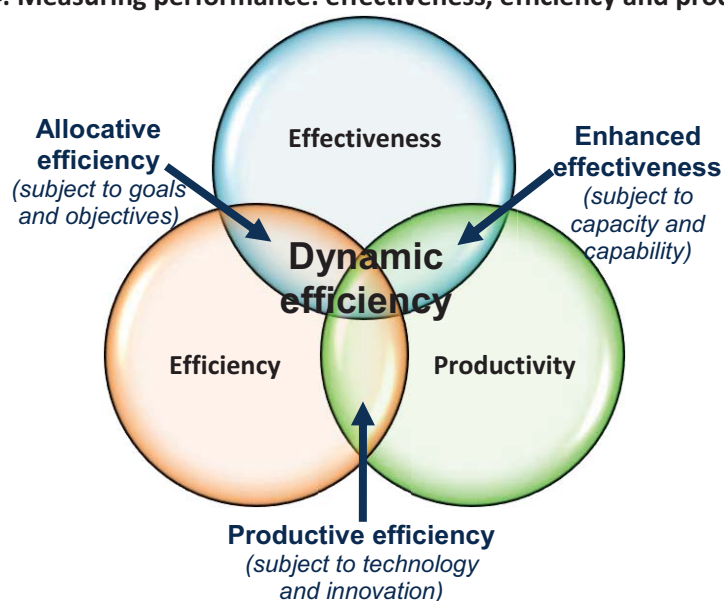
It would be reasonable to suppose that there is a simple, mechanical and consistent link between the concepts of effectiveness and efficiency through which they mutually reinforce each other. In reality, however, the relationship between the two is more complex and problematic. Figure 4 attempts to explain the interrelationships between these concepts in a simplified manner.

Here we argue that effectiveness, efficiency and productivity are all key criteria of dynamic efficiency, and are necessary for measuring performance.

First of all, doing the right thing (effectiveness) and doing it right (efficiency) leads to allocative efficiency. Achievement of allocative efficiency requires achievement of pre-defined objectives or goals relative to the use of resources.

<sup>13</sup> Meso-level analysis is defined as work that makes transport and other market interactions explicit.

Figure 4: Measuring performance: effectiveness, efficiency and productivity



Source: Ministry of Transport

On the other hand, doing the right thing in the right way (productivity) leads to enhanced effectiveness. To achieve enhanced effectiveness in the longer term requires availability of appropriate capacity and capability.

Finally, doing a thing right and in the right way leads to productive efficiency. To ensure productive efficiency in the longer term requires appropriate technology and innovation. Achieving all these should, in principle, contribute to dynamic efficiency and create potential for long term growth.

**Key message:** *There is no one single indicator that can satisfactorily explain the influence of transport on the economy. However, allocative and dynamic efficiency effects of transport improvements are the important frameworks in trying to connect transport and transport policy to the government's economic development objectives.*

*We are not suggesting that the criterion of productivity or growth should be abandoned completely. However, as recommended by literature (e.g. Berechman, 2002, Burnewicz 2005 and Djellal and Gallouj, 2008), we should abandon the focus on one measure (productivity or growth) and replace it with a flexible and pluralistic evaluation approach.*

## 5. Summary

As we understand it, the 'productivity paradox' proposed by the OECD emerged from its reflections on New Zealand's growth performance. This was in the aftermath of the wide-ranging reforms (such as separation of policy and regulatory functions, and the corporatisation of service delivery operations) in New Zealand for about a decade from the mid-1980s. It has been acknowledged that those reforms led to fundamental changes in New Zealand's transport markets<sup>14</sup>. We have not attempted to analyse the impact of those reforms on the transport system over the intervening period. We have, however, attempted to set out some of the issues raised by the paradox.

We have done this by reference to the ongoing challenges in delivering transport policy advice, implementing that policy, and measuring the connections between it and the government's transport and wider economic objectives.

If we accept the proposition that New Zealand's regulatory settings and institutions are sound then the challenge becomes to quantify how the transport system has contributed to New Zealand's economic growth (or welfare).

While the obvious approach might seem to be to analyse trends in transport industry productivity, we have tried to argue that this is unsatisfactory at least from a policy perspective. It fails to reflect the full extent of the inputs that constitute the transport system, the multiple outputs and outcomes that transport policy is tasked with achieving, or the feedback effects that various transport outcomes have on government intervention decisions, as well as on growth and productivity in the longer term.

Given the measurement issues, the difficulties in defining outputs, the presence of externalities and the multi-faceted nature of government's transport policy objectives, there are sound reasons for the flexible and pluralistic evaluation approach which is applied to transport policy questions internationally and in New Zealand.

## 6. References

- Banister, D and Berechman, Y (2001). "Transport investment and the promotion of economic growth", *Journal of Transport Geography*, 9, pp. 209-218.
- Berechman, J (2002), "Transport Investment & economic development - Is there a link?" in "Transport and Economic Development in OECD", Report of 119th Round Table on Transport Economics held in Paris March 2001, Report of Israel, pp.107-135
- Burnewicz, J (2005). "A transport system model that is more compatible with the European macroeconomic environment". Paper presented at the 16th International Symposium of theory and practice in Transport Economics – 50 years of Transport Research experience gained and major challenges ahead, Budapest, 29-31 October 2003, ECMT.
- Djellal, Faridah and Faiz Gallouj (2008) "Measuring and Improving Productivity in Services – Issues, Strategies, and Challenges." Edward Elgar.
- The Eddington Transport Study (2006), "The Case for action: Sir Rod Eddington's advice to Government", HM Treasury.
- Graham DJ (2005), "Wider economic benefits and impacts on GDP", Prepared for UK Department for Transport.
- International Transport Forum (2008) *The Wider Economic Benefits of Transport*.

<sup>14</sup> New Zealand Productivity Commission (2012), "International Freight Transport Services Inquiry: Final Report", April, p.51.



Macro-, Meso- and Micro-Economic  
Transport Planning and Investment Tools

Kuschel, G, Metcalfe, J, Wilton, E, Guria, J, Hales, S, Rolfe, K and Woodward, A (2012), "Updated Health and Air Pollution in New Zealand Study", Prepared for Health Research Council of New Zealand, Ministry of Transport, Ministry for the Environment and New Zealand Transport Agency.

Ministry of Transport, "[Transport Indicator Monitoring Framework](#)".

McFadden, Daniel (2011), "Foreword to A Handbook of Transport Economics", Edward Elgar.

New Zealand Productivity Commission (2012), "[Inquiry into International Freight Transport Services: Final Report](#)", April.

North, Douglass C. (1993), "Economic performance through time", The 1993 Economics Nobel Prize lecture.

OECD (2004), "Economic Surveys 2002-03: New Zealand".

Yeabsley, J and Guria, J (2005). "Implementing the New Zealand Transport Strategy: An evaluation framework". Report to the Ministry of Transport, Wellington, 2005.